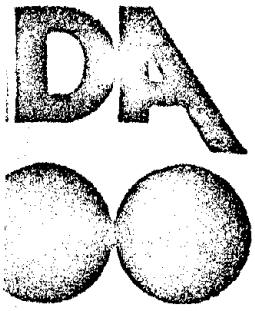

The NIDA Research Monograph series is prepared by the Division of Research of the National Institute on Drug Abuse. Its primary objective is to provide critical reviews of research problem areas and techniques, the content of state-of-the-art conferences, integrative research reviews and significant original research. Its dual publication emphasis is rapid and targeted dissemination to the scientific and professional community.

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First in a series of research monographs published by the Division of Research, NIDA

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The monograph presents an annotated bibliography of NIMH- and NIDA-supported extramural grant research from 1967-74, comprising some 3500 titles and abstracts. Volume 2 is comprised of entries on the behavioral and clinical aspects of drug abuse research, including results of studies of adverse effects, prevention and treatment systems, psychosocial studies, drug abuse education, and epidemiological studies and surveys. A final section, on peripherally related research, reports findings from NIDA-supported drug abuse projects which do not pertain exclusively to that subject. Entries are cross-referenced and indexed by author/editor and by subject/drugs.

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PREFACE

Nearly eight years have elapsed since the inauguration of a high priority Federal research program directed toward better understanding and coping with drug abuse. When that program was begun, estimates of the extent of drug abuse were more frequently based on speculation than on hard data. The basic materials for studying such drugs as marihuana were frequently lacking and research was in its infancy. Opiate research, while it had a much longer history through pioneering work of the Addiction Research Center, the U.S. Public Health Hospitals at Lexington and Fort Worth and other programs, also underwent a much needed expansion.

The research infant has now become a strapping adolescent. While much remains to be learned, this bibliography comprising some 3,500 titles and abstracts attests to the productivity of over 650 researchers whose work was directly supported through grants from the National Institute on Drug Abuse and its predecessor program in the National Institute of Mental Health. Its publication represents an attempt to give some sense of the diversity and scope of the Federal impact on drug abuse research. It is our hope that it will prove to be a valuable source of scientific information in itself and will also serve as a source document for later analysis of the Federal role in its extramural grant program towards shaping and contributing to the overall drug abuse literature.

Preparation of these volumes inevitably leaves us indebted to many individuals and organizations. First and foremost, special thanks are owed to the hundreds of researchers who took time from their busy schedules to give us detailed accounting of the papers they have published arising from our grant support. Without their generous cooperation a reasonably complete accounting would not have been possible. Thanks are also due to the staffs of some twenty libraries, information services and clearinghouses which provided assistance in many ways.

The actual production of the volumes demands thanks to many individuals whose commitment to the detailed preparation required testifies to their fine level of professionalism. Special thanks are due to the staff of Koba Associates, Inc., particularly to Georgette Semick, the project director, ably assisted by Carol Tuckerman and to their research assistants Tina Lindegren and Kath Nesper. Susan Lachter, Acting Chief of the National Clearinghouse for Drug Abuse Information here at NIDA provided necessary assistance as did other members of the NIDA staff.

Robert C. Petersen
Assistant Director, Research Division
NATIONAL INSTITUTE ON DRUG ABUSE

Introduction

PURPOSE

Since September, 1973, the Division of Research of the National Institute on Drug Abuse (NIDA) has been responsible for the coordination of extramural, grant-supported research into the effects of drug use/abuse and for funding projects to examine possible prevention and treatment modalities for its control. NIDA-supported work has its origins in the research program supported and coordinated since the 1960's by the National Institute of Mental Health. The bulk of the Federally funded research has been undertaken since 1967 and the results have been documented in numerous journals, books and other scientific publications.

A listing of published drug abuse literature including synopses of the content was considered necessary in order to provide NIDA with a resource for planning future research directions and for examining the impact of this literature on the scientific community. Thus, the purpose of this annotated bibliography is twofold: 1) to help NIDA program personnel review the findings of previous drug abuse grants in order to plan future research strategies, and 2) to serve as a retrospective indication of the findings from supported research that have been disseminated to the scientific community and the general public.

The publication, Findings of Drug Abuse Research 1967-1974, is a two-volume work that lists the drug abuse research literature supported by NIMH and NIDA and provides abstracts or summaries of the articles when these are provided by the author. Each volume may be used independently and each is indexed.

PREPARATION OF THE BIBLIOGRAPHY

Having defined the scope of the final product as research literature produced under NIMH-NIDA grants during the period 1967-1974, the first major task was to identify the relevant grants and their principal investigators (PIs). The methodology for collecting the materials was based on the assumptions that the Principal Investigator would, at minimum, be familiar with the literature produced as a result of his/her grant and in most cases would also have copies of that literature. Lists of principal investigators were developed by utilizing NIMH and NIDA files of grantees and the Research Grants Index published by the Public Health Service. Each identified Principal Investigator then received a personally addressed letter explaining the project and requesting lists (and copies) of literature produced as a result of drug use/abuse grants for which s/he was designated as PI.

PIs were also asked to identify in a preliminary way which of ten program areas of drug use/abuse research would best classify their literature. By receiving this additional information from the PIs themselves, the project staff was provided with a firmer foundation for designing the final product.

The first request to PIs yielded an approximate 50 percent response rate within a period of one month. To augment this response the project staff sent out follow-up reminders to non-respondents while concurrently contacting information resources such as the National Clearing House for Drug Abuse Information, the Student Association for the Study of Hallucinogens, Inc. (STASH) and the Addiction Research Foundation to obtain lists of articles and books published by those PIs who were not located by the principal contact method. Final response was from approximately 60 percent of all PIs. These sources produced the remainder. To monitor the communication with PIs and other information sources and to

organize information received, detailed recordkeeping systems were developed. File systems recorded the number of articles identified and submitted, classified or unclassified, and listed the literature identified but not accompanied by abstracts or articles. Literature received was checked for complete publication information and filed by its appropriate classification category.

Using the prepared resource list of drug abuse research and medical libraries, information services and clearinghouses, the project staff attempted to locate the several hundred articles which PIs identified but which were not forwarded or classified by the investigators. Once found, these were screened, classified and filed in accordance with project specifications.

Following the collection of all identified articles and/or books, the final classification system and entry format were defined. Each entry was then formatted (accompanied by its author-prepared abstract or summary where available), cross-referenced where necessary and prepared for final submission to NIDA.

FORMAT AND ANNOTATION SYSTEM

In order to create a bibliography of optimal use, several questions were kept in mind throughout the design stages: "What format would most readily facilitate the bibliography's use?" and "What information about each item is necessary for subsequent location by users?" These questions were carefully considered throughout the bibliography design process.

The format design reflects the bibliography's principal, intended use (i.e., for program planning and evaluation) by organizing the material into program/subject areas. Within each category the entries are organized alphabetically by author. To facilitate identification of new entries and location of cross-references, the author's (s') name(s) appears in capital letters. Publication and descriptive information about each item is provided in a standard bibliographic form which supplies information about the author(s) or editor(s), title of the chapter or article, source (book, proceedings or journal) including volume numbers and pages where applicable, book's publisher and dates of publication or presentation. Following the entry's bibliographic information the author-prepared abstract or summary (unedited) is included.

Whenever possible, author-prepared abstracts, summaries or short conclusions are used to describe the articles, books and proceedings. Since author-prepared abstracts are not always required by the publisher, both annotated and non-annotated citations are found in the bibliography. The intended use of the bibliography required that the findings be consistently validated. Therefore, when no author-prepared abstract was available, the project staff did not attempt to summarize the findings. In the same vein, no attempt has been made to change or edit the abstracts and summaries for consistent language; thus, words such as 'our' and 'I' still remain.

Missing abstracts are not available for a variety of reasons: the articles are out of print; literature is now "in press"; papers presented at meetings, conferences and symposia have not to date been published; short abstracts or summaries were never required. In such cases the unannotated bibliographic information has, nonetheless, been provided.

CLASSIFICATION OF ENTRIES

The classification system was designed to dovetail with the primary intended use of the bibliography: to review the progress of the NIMH-NIDA supported drug abuse research programs. Thus, the sections of the bibliography parallel the program areas of NIDA research. To determine whether the eleven categories were descriptive of the existing literature, the PIs were requested to indicate which of the suggested categories were most applicable for their articles and abstracts. Suggestions of alternative classification categories and systems were encouraged. A review of the replies received from the PIs showed that, for the most part, the program areas also adequately classified the grant-supported literature.

The ten subject-program categories that correspond with the first ten sections of the bibliography are:

I. Methodology of Drug Research
II. Drug Chemistry and Metabolism
III. Mechanisms of Action of Different Drugs
IV. Behavioral Studies

V. Adverse Effects, Toxicity and Genetic Effects
VI. Drug Use/Abuse Prevention
VII. Treatment-Related Research
VIII. Psychosocial Studies
IX. Education
X. Epidemiological Studies and Surveys

The eleventh section, "Peripherally Related", was included to list those materials that do not pertain exclusively to drug abuse research, but which are produced as an offshoot of NIMH and NIDA-supported drug abuse projects. For this reason entries in this category include references to subcategories such as therapeutic aspects of various abusable drugs, analytical techniques for more generalized behavioral research and the body's receptors for psychoactive drugs.

CROSS REFERENCES

Because many of the articles and books summarize findings related to several of the ten program areas, a cross-reference system was developed. In this way entries could be included in all relevant subject categories without duplicating the abstracts for each listing. The annotation for any cross-referenced entry can be found with the first citation. In subsequent categories the entry includes complete bibliographic information; however, for the abstract the reader is then referred to the earlier section.

INDEXES

To increase the usefulness of the bibliography, indexes have been provided for author/editor and for subject/drugs. So that the two volumes may be used independently, these indexes have been inserted at the end of both volumes. Virtually all index and cross references are to sections within the same volume.

CONTENTS OF VOLUME 1

The first volume of Findings of Drug Abuse Research offers three sections of entries pertaining to the methodology of drug abuse research and findings of basic research into the chemical and metabolic characteristics of drugs and their mechanisms of action.

CONTENTS OF VOLUME 2

The second volume of Findings of Drug Abuse Research includes entries on the behavioral and clinical aspects of drug abuse research including results of studies of adverse effects, prevention and treatment systems and the literature on human and psychosocial factors of drug abuse research (i.e., psychosocial studies, education and epidemiology of drug abuse).

The final section, entitled "Peripherally Related", contains findings from NIDA-supported drug abuse projects which do not pertain exclusively to that subject.

CONTENTS

VOLUME 1

VOLUME 2

IV. Behavioral Studies

ABEL, E.L., editor. Behavioral and Social Effects of Marijuana. New York: MSS Information Corporation, 1973.

For abstract, see Section II. Drug Chemistry and Metabolism.

ABEL, E.L. Suppression of pup retrieving behavior in rats following administration of 1-delta-9-tetrahydrocannabinol. Experientia 28: 1187 (1972)

ABEL, E.L., McMILLAN, D.E. and HARRIS, L.S. Tolerance to the behavioral and hypothermic effects of 1-delta-9-tetrahydrocannabinol in neonatal chicks. Experientia 28: 1188-1189 (1972)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

ADAMS, P.M. and BARRATT, E.S. Effect of chronic marijuana administration on stages of primate sleep-wakefulness. Biological Psychiatry (in press)

The effects of the repeated administration of delta-9-tetrahydrocannabinol on sleep-wakefulness patterns were studied in adult, male squirrel monkeys. The percent time spent in slow wave sleep was reduced with chronic treatment and failed to return to baseline levels after 30 days of recovery. The amount of time spent in Stage 1 or drowsy state increased with repeated treatment and remained elevated through recovery. Changes observed in other stages of sleep-wakefulness were sensitive to repeated treatment with marijuana but were found to return to baseline levels during recovery.

ADAMS, W.J., LORENS, S.A. and MITCHELL, C.L. Morphine enhances hypothalamic self-administration in the rat. Proceedings of the Society for Experimental Biology and Medicine 140: 770-771 (1972)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

ADAMS, W.J., YEH, S.Y., WOODS, L.A. and MITCHELL, C.L. Drug-test interaction as a factor in the development of tolerance to the analgesic effect of morphine. The Journal of Pharmacology and Experimental Therapeutics 168(2) 251-257 (1969)

Drug-test interaction as a factor in tolerance development to the analgesic effect of morphine was studied in rats using the hot plate procedure. The rats were randomly divided into five major groups: tested, nontested, tested without agent, ambient temperature tested and ambient temperature tested without agent. Morphine (5 mg/kg s.c.) or saline (2 ml/kg s.c.) was administered once a week. The results clearly demonstrated that the degree of tolerance development was greater when experience was acquired on the plate while under

Adams, W.J., Yeh, S.Y., Woods, L.A. and Mitchell, C.L. continued
the influence of morphine than when morphine was given in the absence of testing. This effect occurred irrespective of whether the animals received experience on the hot (55°C) plate or the ambient (25°C) plate. Moreover, experience acquired on the plate in the absence of morphine did not alter the responsiveness to a subsequent injection of morphine. These results clearly indicate that a drug-test interaction occurs with morphine and can play a role in the development of tolerance to the analgesic effect of this drug.

ADLER, M.W., BENDOTTI, L., GHEZZI, D., SAMANIN, R. and VALZELLI, L. Dependence to morphine in differentially housed rats. Psychopharmacologia (in press)

ADLER, M.W., LIN C., SMITH, K.P., TRESKY, R. and GILDENBERG, P.L. Lowered seizure threshold as a part of the narcotic abstinence syndrome in rats. Psychopharmacologia 35: 243-247 (1974)

For abstract, see Section I. Methodology of Drug Research.

ANDERSON, T. and SCHANBERG, S.M. Effect of thyroxine and cortisol on brain ornithine decarboxylase activity and swimming behavior in developing rat. Biochemical Pharmacology (in press)

ARNFRED T. and RANDRUP, A. Cholinergic mechanism in brain inhibiting amphetamine-induced stereotyped behaviour. Acta Pharmacologia et Toxicologia 26: 384-394 (1968)

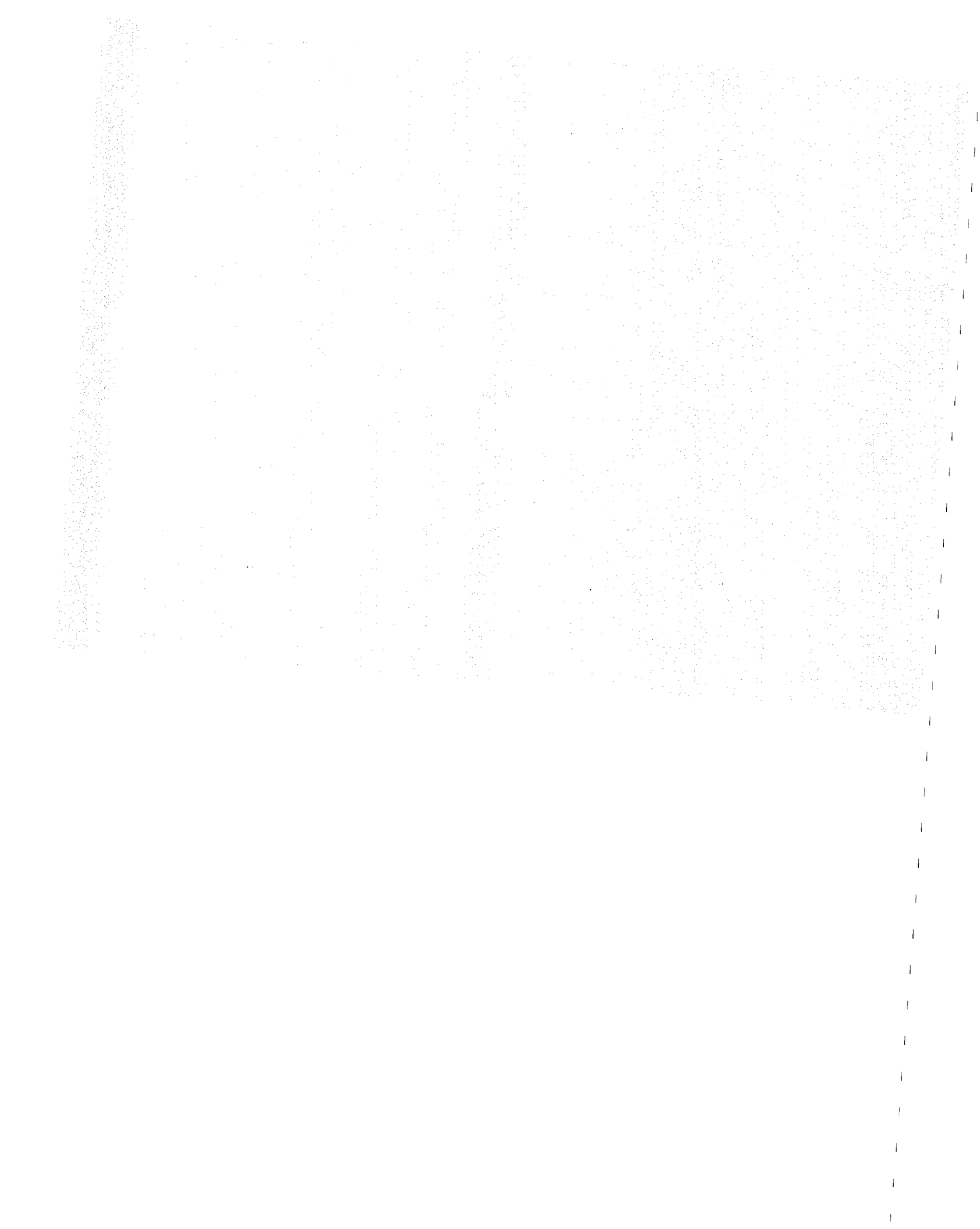
For abstract, see Section III. Mechanisms of Action of Different Drugs.

ASTON, R. and HIBBELN, P. Induced hypersensitivity to barbital in the female rat. Science 157(3795): 1463-1464 (September, 1967)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

AYHAN, I.H. and RANDRUP, A. Behavioural and pharmacological studies on morphine-induced excitation of rats. Possible relation to brain catecholamines. Psychopharmacologia 29: 317-328 (1973)

In the present experiments the influence of small acute doses of morphine on rat behaviour was investigated. Small doses of morphine produced stimulation of locomotion, rearing, grooming, eating and drinking. Inhibition of catecholamine biosynthesis by alpha-methyl tyrosine and FLA-63 or blockade of the catecholamine receptors in the brain could inhibit the behavioural stimulant effects of morphine. Comparison between the morphine-based hyperactivity and the stimulation of behaviour by amphetamine showed that the behavioural profiles of the excitation produced by these drugs differ significantly from each other, and it was concluded that morphine stimulated the behaviour of rats probably by a different mechanism from that of amphetamine.



AYHAN, I. H. and RANDRUP, A. Role of brain noradrenaline in morphine-induced stereotyped behavior. Psychopharmacologia 27: 203-212 (1972)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

BABBINI, M. and DAVIS, W. M. Studies on the locomotor activity effects of morphine in rats. The Pharmacologist 9: 219 (1967)

Effects of 6 dosages of morphine sulfate (1.25, 2.5, 5, 10, 20, 40 mg/kg) upon the locomotor activity of rats after a single dose were observed for 8 hours in photocell actometers. The lower 3 dosages had a purely excitatory effect on mobility and the log dose-effect relationship was essentially linear. However, the higher dosages showed a diphasic pattern: mobility was decreased during the first hours after injection, but increased in the following hours over the controls. Linear relationships were found between log dose and magnitude of both inhibitory and excitatory effects and also time of appearance of the excitatory phase. The same dosages were administered to groups of rats once daily for 30 days. The effects of the 3 lower dosages on activity did not change with time, but that of the higher dosages was definitely altered. The depressive phase gradually disappeared, while an enhanced excitatory effect became evident. The rate of enhancement was greater as dosage increased. No day to day carry over effect of continued treatment on basal mobility level was detected. Explanation of these results on the basis of two different receptors affecting motor activity is suggested.

BABBINI, M. and DAVIS, W. M. Time-dose relationships for locomotor activity effects of morphine after acute or repeated treatment. British Journal of Pharmacology 46(2): 213 (October, 1972)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

BAKER, W. W. Excitatory responses following intracaudate injection of N-methyl-dl-aspartic acid. Archives internationales de Pharmacodynamie et de Therapie 196: 226-234 (1972)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

BALSTER, R. L. and Schuster, C. R. A comparison of d-amphetamine, l-amphetamine, and methamphetamine self-administration in rhesus monkeys. Pharmacology Biochemistry and Behavior 1(1): 67-71 (1973)

Rhesus monkeys were trained to self-administer cocaine on a fixed-ratio 10 schedule of reinforcement during a daily 3 hr session. d-Amphetamine, l-amphetamine, and methamphetamine, at various dosages, were substituted for the cocaine for six consecutive sessions. The animals were returned to cocaine baseline between each test series. All three drugs were self-administered at rates higher than saline control levels. d-Amphetamine and methamphetamine were equipotent in maintaining self-administration behavior and both were approximately 4 times more potent than l-amphetamine.

BALTER, M.B. and LEVINE, J. The nature and extent of psychotherapeutic drug usage in the United States. Psychopharmacology Bulletin 5: 3-14 (1969)

BALTER, M.B., LEVINE, J. and RUBINSTEIN, I. Cross-national study of the extent of anti-anxiety/sedative drug use. Presented at the Eighth Congress of the Collegium Internationale Neuro-Psychopharmacologicum, Copenhagen, Denmark, 1972.

BARRY H. and KUBENA, R.K. Discriminative stimulus characteristics of alcohol. Drug Addiction: Experimental Pharmacology, Vol 1. Edited by J. Singh, L.H. Miller and H. Lal. Mount Kisco, New York: Futura Publishing Company, Inc., 1972. Pp. 3-16.

The specificity of drugs for discriminative response by drug conditioning is reviewed. Twenty-four albino Wister rats were trained to make differential and avoidance responses on the basis of drug or control condition. The food or shock was delivered automatically in an operant conditioning chamber after every fifth lever press during 5 minute sessions. Different groups of rats were trained with 3 drugs: ethyl alcohol, atropine sulfate, and delta-1-tetrahydrocannabinol (THC), injected intraperitoneally a short time before the test session. A rather high degree of behavioral toxicity was manifested by the animals when injected for the first time with the doses of alcohol, atropine, and delta-1-THC used for training the discriminatory response. Rapid behavioral tolerance is indicated by learning to make the approach response under the drug condition. However, there was no evidence for development of physical tolerance. In general, the results were similar for the 3 drugs and for the groups trained to associate food with drug or control conditions. Thus, a high percentage of approach response, combining the 2 groups trained to associate food reward with the alternative drug and control conditions, indicates a fear reducing or disinhibitory effect, as in the alcohol animals with low doses of pentobarbital and chlordiazepoxide. A low percentage of approach (high percentage avoidance), combining the 2 groups, indicates general depression or behavioral toxicity.

BARTOLINI, A., WEISENTHAL, L.M. and DOMINO, E.F. Effect of photic stimulation on acetylcholine release from cat cerebral cortex. Neuropharmacology 11: 113-122 (1972)

Cortical release of acetylcholine was assayed using the leech muscle preparation in cats with transected brainstems. Both spontaneous and elicited somatosensory and visual cortical release of acetylcholine were measured, photic stimuli being directed into both eyes of midpontine-pretrigeminal and prepontine preparations. Animals with midpontine transections had a higher spontaneous release of acetylcholine from the visual cortex than did prepontine animals, but photic stimulation did not increase acetylcholine release. The prepontine cats tended to show an increase in cortical release of acetylcholine to photic stimulation which was not statistically significant. After injections or topical application of scopolamine, spontaneous and elicited release of acetylcholine was markedly increased. Thus, photic stimulation of the retinae did not markedly increase acetylcholine release, either with or without scopolamine treatment, and the evoked release of acetylcholine from the visual cortex was similar to that from the sensorimotor cortex. Differences in acetylcholine release between cats with "activated" and "synchronized" EEGs were demonstrated before and after scopolamine. The content of aceylcholine in the motorsensory, somatosensory, auditory and visual cortices varied, with the lowest in the somatosensory and the highest in the visual area. In contrast, the release of acetylcholine was higher in the somatosensory than in the visual area, suggesting that the former has a higher turnover rate of acetylcholine. The data suggest that acetylcholine is not released from primary visual afferent fibers, but rather from neurons involved in a diffuse brainstem activating system.

BARTOLUCCI, G., FRYER, L., PERRIS, C. and SHAGASS, C. Marijuana psychosis: A case report. Canadian Psychiatric Association Journal 14: 77-79 (1969)

BECK, E.C. Electrophysiology and behavior. Annual Review of Psychology 26: 233-262 (1975)

BHARGAVA, H.N. and WAY, E.L. Brain acetylcholine (ACh) and choline (Ch) changes during acute and chronic morphinization and during abrupt and naloxone precipitated withdrawal in morphine tolerant-dependent mice and rats. Proceedings of the Western Pharmacological Society 17: 173-177 (1974)

BIGELOW, G. and THOMPSON, T. Behavioral effects of morphine and methadone in rhesus monkeys. Psychonomic Science 24(5): 215-217 (1971)

Two rhesus monkeys, working on fixed-ratio schedules for appetitive reinforcement, were given injections of morphine sulfate and methadone hydrochloride. Morphine was the more potent in decreasing operant responding. Responding was restored sooner following methadone injections than following morphine injections. Response decreasing potency does not correspond to analgesic potency.

BLUM, K. Effects of chlordiazepoxide and pentobarbital on conflict behavior in rats. Psychopharmacologia 17: 391-398 (1970)

A punishment discrimination ("conflict") was conditioned in rats by simultaneously rewarding with food (sweetened, condensed milk) and punishing with shock all lever responses made in the presence of an auditory stimulus. Chlordiazepoxide and pentobarbital were administered in order to compare degrees of attenuation of conflict behavior relative to the production of behavioral debilitation. Chlordiazepoxide produced the maximum attenuation at doses that produced only minimum debilitation. In general, conflict attenuation ("anti-anxiety") was greater under chlordiazepoxide while general debilitation (behavioral toxicity) was greater for pentobarbital.

BLUM, K., McDONALD, L., MADDUX, J. and WALLACE, J.E. Production of "wet-dog" shakes by chronic administration of methadone in female rats. Drug Addiction: New Aspects of Analytical and Clinical Toxicology, Vol. 4. Edited by J.M. Singh and H. Lal. Mt. Kisco, New York: Futura Publishing Company, Inc., 1973. Pp. 123-236.

Female rats were made tolerant to and possibly dependent upon methadone by seven weeks of continuous subcutaneous injections. Distinct abstinence signs were observed. Withdrawal was monitored by assessing "wet-dog" shakes, a procedure used to quantitate morphine dependence in rats. The data imply that wet-dog shakes may constitute a satisfactory index for determining methadone dependence in this species.

BOHDANECKY, Z., JARVIK, M.E. and CARLEY, J.L. Differential impairment of delayed matching in monkeys by scopolamine and scopolamine methylbromide. Psychopharmacologia 11: 293-299 (1967)

The effects of scopolamine hydrobromide and its quaternary analogue, scopolamine methylbromide, in two doses (0.2 and 0.4 mg/kg) upon delayed matching performance was studied in monkeys. Scopolamine in the lower dose depressed significantly only performance rate, while in the higher dose it depressed both performance rate and percentage accuracy of the monkeys during the first two cycles of the experiment. On the other hand, scopolamine methylbromide (both doses) depressed just responding rate, but the effect was more pronounced towards the end of the experiment (i.e. after more than 10 hr after drug administration). These results indicate the ability of scopolamine methylbromide to influence behavior possibly by passing the blood brain barrier and thus impair the response rate of the animals.

BONNET, K.A. and PETERSON, K.E. A modification of the jump-flinch technique for measuring pain sensitivity in rats. Pharmacology Biochemistry and Behavior (in press)

For abstract, see Section I. Methodology of Drug Research.

BORBERG, S. Conditioning of amphetamine-induced behaviour in the albino rat. Psychopharmacologia 34: 191-198 (1974)

12 male albino rats were injected with amphetamine, 5 mg/kg, every 4th or 5th day, 30 times/rat in all, and their behaviour recorded 10-31 min after injection. During the observation period 4 rats, the stereotypy-group, were electrostimulated when they did not demonstrate stereotypy, which is a well-defined, constantly and spontaneously occurring amphetamine-induced behaviour. 4 rats non-stereotypy-group, were stimulated when demonstrating stereotypy. 4 rats acted as control group and were not stimulated.

Whereas there was no difference between the groups during the first experiments, their behaviour differed in a statistically significant way during the experiments with stimulation, and the difference remained during control experiments without stimulation. The groups differed in the following way: the stereotypy-group demonstrated a high percentage of stereotypy per experiment, the non-stereotypy-group a low percentage, while the results of the control group lay between those of the stimulated groups.

It is concluded that stereotypy can be subjected to conditioning.

BORGEN, L.A. and DAVIS, W.M. Cannabidiol (CBD) attenuation of effects of delta-9-THC. The Pharmacologist 15(2): 201 (1973)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

BORGEN, L.A. and DAVIS, W.M. Delta-9-tetrahydrocannabinol (delta-9-THC) dose effects compared on three schedules of food-reinforced operant performance. Federation Proceedings 32(3): 725 (March, 1973)

Three groups of six male rats were conditioned to bar-press for food reinforcers (45 mg pellets) on one of three schedules of reinforcement: fixed ratio 100 (FR), fixed interval of 60 sec (FI), or variable interval of mean 60 sec (VI). Following baseline stabilization, the rats were injected i.p. with delta-9-THC at dosages of 0.3, 0.6, 1, 2, 3, or 5 mg/kg. Doses were given in mixed order at two-week intervals. Delta-9-THC was suspended with 10% polyvinylpyrrolidone in 0.9% NaCl. Although responding was depressed progressively with increasing doses under all schedules, significant differences were observed between the three schedules. FR response rates were most sensitive to delta-9-THC, while VI performance was least sensitive. On the FI schedule only, low doses of delta-9-THC produced a moderate increase in response rate while higher doses produced depression. At intermediate doses of delta-9-THC, the overall response rate on FI schedule was reduced without alteration in the temporal pattern of performance. Under the FR schedule, post-reinforcement pausing and running rates were equally sensitive to the effects of delta-9-THC.

BORGEN, L.A. and DAVIS, W.M. Vehicle and route of administration as parameters affecting operant behavioral effects of delta-9-tetrahydrocannabinol. Journal of Pharmaceutical Sciences 62(3): 479-480 (March, 1973)

For abstract, see Section I. Methodology of Drug Research.

BORGEN, L.A., KHALSA, J.H., KING, W.T. and DAVIS, W.M. Strain differences in morphine-withdrawal-induced aggression in rats. Psychonomic Science 21(1): 35-36 (1970)

BOUDIN, H.M. and VALENTINE, V.E., III. Behavioral techniques as an alternative to methadone maintenance. Advances in Behavioral Therapy (in press)

BRADY, J.V., GRIFFITHS, R. and WINGER, G. Drug-maintained performance procedures and the evaluation of sedative hypnotic dependency potential. Presented at the Upjohn Conference on Hypnotics, Kalamazoo, Michigan, July, 1974.

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BRASE, D.A., TSENG, L., LOH, H.H. and WAY, E.L. Cholinergic modification of naloxone-induced jumping in morphine dependent mice. European Journal of Pharmacology 26: 1-8 (1974)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

BREESE, G.R., COOPER, B.R. and MUELLER, R.A. Evidence for involvement of 5-hydroxytryptamine in the actions of amphetamine. British Journal of Pharmacology 52: 307-314 (1974)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

BREESE, G.R., COOPER, B.R. and SMITH, R.D. Biochemical and behavioural alterations following 6-hydroxydopamine administration into brain. Frontiers in Catecholamine Research. Edited by E. Usdin and S.H. Snyder. New York: Pergamon Press, 1973.

For abstract, see Section III. Mechanisms of Action of Different Drugs.

BRILL, N.Q. Longitudinal study of college marijuana users. Proceedings of the Twentieth Annual Conference of Air Force Behavioral Scientists, Brooks Air Force Base, San Antonio, Texas, 1973.

BRILL, N.Q. and CHRISTIE, R.L. Marihuana use and psychosocial adaptation. Archives of General Psychiatry 31: 713-719 (November, 1974)

A longitudinal study of a representative sample of 1970 college students disclosed that a great majority of students who had used marihuana reported "no effect" or "improved" adjustment in 1972, but a small group reported worsened adjustment and showed a clear trend to have decreased or quit the use of the drug. Many others who quit or reduced their use of marihuana, nevertheless reported its effects as favorable. No significant difference in grade point average or educational achievement was found between users and nonusers.

Marihuana users experienced somewhat more difficulty in deciding on career goals and left college a little more often (than nonusers) to reassess their goals. Amotivational syndromes, if they occurred, were not observed in a large number of students who, despite using marihuana, were continuing to function satisfactorily.

BUXBAUM, D.M., BUSHING, J.A., CARTER, M.E. and SANDERS-BUSH, E. Long-term effects of p-chloroamphetamine (PCA) on cerebral serotonin (5HT) and morphine (M)-induced locomotor activity in the rat. Presented at the Fifth International Congress on Pharmacology, San Francisco, California, 1972.

BUXBAUM, D. and SCHMIDT, D.E. Modification of motor induced motor effects by cholinergic antagonists and effects of morphine on regional ACh utilization in rat. Federation Proceedings (in press)

BYRD, L.D. Effects of d-amphetamine on schedule-controlled key pressing and drinking in the chimpanzee. The Journal of Pharmacology and Experimental Therapeutics 185(3): 633-641 (1973)

Effects of d-amphetamine on schedule-controlled key pressing and on water intake were studied in the chimpanzee. Key pressing during daily sessions was maintained under a multiple schedule comprising a 10-minute fixed-interval schedule and a 100-response fixed-ratio schedule of food delivery. Water intake during the two-hour session totaled 1.5 to 2.0 liters in one chimpanzee and was greatest during the 10-minute fixed-interval schedule. Effects of d-amphetamine on key pressing and drinking during the session, and on drinking in the living area following the session, were dose related. Mean rates of key pressing under the fixed-interval schedule were enhanced by 0.3 to 1.0 mg/kg, and mean rates under the fixed-ratio schedule were enhanced by 0.03 to 0.3 mg/kg. Effects of d-amphetamine on key pressing during successive quarters of the fixed-interval schedule were a function of control rates of responding. Drinking during the session and drinking in the living area during the first 12 hours following the session were decreased by doses (0.03-0.3 mg/kg) that had either little effect or an enhancing effect on key pressing. Drinking was nearly completely eliminated by 1.0 to 3.0 mg/kg of d-amphetamine. At none of the doses studied did d-amphetamine enhance drinking.

BYRD, L.D. Modification of the effects of chlorpromazine on behavior in the chimpanzee. The Journal of Pharmacology and Experimental Therapeutics 189(1): 24-32 (1974)

During daily two-hour sessions, key pressing behavior in the chimpanzee was maintained under a multiple schedule comprising a 10-minute fixed-interval schedule and a 30-response fixed-ratio schedule of food delivery. Water was freely available in the chimpanzee's living area and in the experimental chamber, and schedule-related drinking occurred regularly during the session. Chlorpromazine had dose-dependent effects on key pressing and on water intake during the session. The drug increased mean response rates under the fixed-interval schedule at doses of 0.03 to 0.3 mg/kg i.m. and decreased responding at 1.0 to 3.0 mg/kg. The high rates of responding engendered under the fixed-ratio schedule were not affected by the lower doses, but were decreased by doses of 1.0 to 3.0 mg/kg. Water intake was also unaffected by doses below 1.0 mg/kg, but decreased at doses of 1.0 to 3.0 mg/kg. Presentation of a brief (20 msec) auditory stimulus after each response during the fixed-interval and fixed-ratio schedules potentiated the enhancing effect of chlorpromazine on responding under the fixed-interval schedule. Presentation of the brief stimulus did not alter the effects of chlorpromazine on responding under the fixed-ratio schedule and on water intake, however. These results show that 1) chlorpromazine can enhance schedule-controlled responding in the chimpanzee, 2) the enhancing effect of chlorpromazine can be potentiated when each response produces a brief change in environment stimuli and 3) chlorpromazine only affects water intake at doses that also disrupt responding.

CAMPBELL, B.A. and FIBIGER, H.C. Potentiation of amphetamine-induced arousal by starvation. Nature Physical Science 233(41): 424-425 (October, 1971)

CAMPBELL, B.A., LYTLE, L.D. and FIBIGER, H.C. Ontogeny of adrenergic arousal and cholinergic inhibitory mechanisms in the rat. Science 31: 637-638 (October, 1969)

With spontaneous activity as a measure of arousal, dose response curves were established for scopolamine and amphetamine administered to 10-, 15-, 20-, 25-, and 100-day old rats. Amphetamine always increased activity, but scopolamine had no effect on younger rats, which suggests that adrenergic excitatory areas in the brainstem mature more rapidly than cholinergic inhibitory areas in the forebrain.

CAMPBELL, B.A. and MABRY, P.D. The role of catecholamines in behavioral arousal during ontogenesis. Psychopharmacologia 31: 253-264 (1973)

Effect of catecholamine depletion on normal hyperactivity in the neonatal rat was examined. Both alpha-methyl-para-tyrosine and reserpine significantly depressed behavioral arousal at 15 days postpartum, the age of greatest excitability. Heightened activity could be restored in drug-tested animals by administration of L-Dopa. These results indicate that the ontogenetic hyperactivity effect is a result of accelerated catecholamine function.

CAMPO, R.A. Development of tolerance in pigeons to behavioral effects of a new benzopyran derivative. The Journal of Pharmacology and Experimental Therapeutics 184(3): 521-527 (1973)

Pigeons were trained under a multiple fixed-ratio, fixed-interval schedule of food presentation until their performance in daily sessions was consistent from day to day. Effects of a new nitrogen-containing benzopyran derivative, SP-1, on the performance was then studied. Doses of SP-1 up to 0.3 mg/kg had little effect on rates of responding; higher doses reduced responding, until a dose of 3.0 mg/kg abolished responding in both components of the schedule and produced ataxia. When the 3.0 mg/kg dose of SP-1 was injected daily, responding was suppressed during each of the first three days, but on succeeding days responding progressively recovered. The daily dosage was then increased to 10.0 mg/kg, then to 17.0 mg/kg and finally to 30.0 mg/kg of SP-1. After the first few days the mean rate of responding was always above 50% of control rate and responding after the last injection of 30.0 mg/kg, ending 17 daily drug injections, was essentially normal. After a period of 30 days without drug, 30 mg/kg of SP-1 still did not suppress responding, showing the persistence of a strong tolerance to the suppressive behavioral effects of the drug. After a period of 100 days without drug, however, a single injection of 30.0 mg/kg again suppressed responding and caused ataxia in the pigeons.

CARDER, B. and OLSON, J. Learned behavioral tolerance to marihuana in rats. Pharmacology Biochemistry and Behavior 1(1): 73-76 (1973)

Rats were trained to press a lever for food reinforcement in one study and water reinforcement in a second. Rats which received marihuana extract each day before behavioral testing showed an impairment of responding on the first day of drug application, but developed behavioral tolerance to the drug by the sixth day of drug application. Rats which received equal doses of marihuana after each session, rather than before, over the same period, showed little or no evidence of behavioral tolerance when the drug was administered before testing. This result was interpreted to indicate that the development of behavioral tolerance to marihuana involves a learning process.

CARDER, B. and OLSON, J. Marihuana and shock induced aggression in rats. Physiology and Behavior 8(4): 599-602 (1972)

Rats treated with marihuana extract to yield 1-delta-9-THC doses of 0.25 and 0.50 mg/kg fought more than controls in a shock-induced aggression situation. A dose of 0.12 mg/kg was ineffective, while doses of 1.00 and 2.00 suppressed fighting. When animals were familiarized with the test situation, the drug, or both, increases in aggression were not produced by the drug.

CARLINI, E.A., KARNIOL, I.G., RENAULT, P.F. and SCHUSTER, C.R. Effects of marihuana in laboratory animals and in man. British Journal of Pharmacology 50: 206-216 (1974)

CARNEY, J. Effects of morphine, codeine and naloxone on food- and codeine-reinforced responding in the rhesus monkey. The Pharmacologist 16: 264 (1974)

Monkeys were trained to press a lever thirty times (FR-30) to obtain a pellet of food or an intravenous infusion of codeine. The experimental session was divided into three periods. In periods I and III the responding was maintained by presentation of food; in period II responding was maintained by intravenous infusions of codeine. Before the monkeys were exposed to codeine in period II, morphine was more potent than codeine in suppressing food-reinforced responding and naloxone (less than or equal to 10 mg/kg) was without effect in 6 of 7 monkeys. The rate of codeine-reinforced responding was always lower than that of food-reinforced responding and was inversely related to the dose of codeine (0.03-3.2 mg/kg/inj) infused. A negatively accelerated rate of responding within period II was observed regardless of dose. Food-reinforced responding occurred at equal rates in periods I and III suggesting that the negatively accelerated pattern of drug-reinforced responding was not the result of a general depression of responding. Dose-effect curves were repeated after more than two months of daily codeine self-administration. The dose-effect curves for morphine and codeine on food-reinforced responding were shifted to the right. Doses of morphine, codeine and naloxone, below those that reduced food-reinforced rates, suppressed codeine-reinforced responding.

CARNEY, J., LLEWELLYN, M. and WOODS, J.H. Comparison of codeine and ethyl alcohol self-administration under a variable interval (VI) schedule in monkeys. Federation Proceedings 32: 726 (1973)

Rhesus monkeys responded on a VI 2 minute schedule of either codeine or ethanol reinforcement. After stabilization at the training doses of 0.1 mg/kg/inj. codeine or 0.1 gm/kg/inj. ethanol, animals were exposed successively to each of a variety of doses of codeine (.003-1.0 mg/kg/inj.) or ethanol (.03-.56 gm/kg/inj.) for ten day periods at each dose. Maximum response rates (0.1-0.2 responses per second) were maintained by 0.1 mg/kg/inj. of codeine and by 0.18 gm/kg/inj. of ethanol. Higher or lower doses resulted in lower rates of responding. The rate of both codeine- and ethanol-reinforced responding progressively decreased throughout the one hour session. The frequency of codeine injections did not change throughout the session, while ethanol injections decreased in frequency similar to the decline in rate of responding. Replication of doses which maintained maximal rates resulted in a 2.5-fold increase in ethanol-reinforced response rates and no change in responding maintained by codeine.

CASSWELL, S. and MARKS, D.F. Cannabis and temporal disintegration in experienced and naive subjects. Science 179: 803-805 (February, 1973)

The effects of 3.3 and 6.6 milligrams of delta-9-tetrahydrocannabinol and of placebo on performance of three cognitive tasks were compared for naive subjects and experienced cannabis smokers. No differences in performance or reported subjective effects were found between these two groups. A significant decrement was found following dosage at both levels, replicating earlier findings of temporal disintegration during cannabis intoxication.

CHARAP, A.D. and GLICK, S.D. Abnormal escape behavior following morphine administration. Committee on Problems of Drug Dependence. Washington, D.C.: National Academy of Sciences, National Research Council, 1973. Pp. 562-568.

Mice previously capable of escaping a shock did not do so following an injection of morphine. No tolerance to this effect was observed after 15 daily morphine injections. No improvement in escape performance was observed during a two week testing period following discontinuation of morphine injections. This result suggests that morphine induces the learning of a maladaptive response which persists long after cessation of morphine administration.

CHENEY, D.L. and GOLDSTEIN, A. The effect of rho-chlorophenylalanine on opiate-induced running, analgesia, tolerance and physical dependence in mice. The Journal of Pharmacology and Experimental Therapeutics 177(1): 309-315 (1971)

For abstract, see Section II. Drug Chemistry and Metabolism.

CHENEY, D.L. and GOLDSTEIN, A. Tolerance to opioid narcotics, III. Time course and reversibility of physical dependence in mice. Nature 232: 477 (1971)

CHRISTY, D. and REID, L. Methods of deconditioning persisting avoidance: Amphetamine and amobarbital as adjuncts to response prevention. Bulletin of the Psychonomic Society (in press)

CICERO, T.J., MEYER, E.R. and SMITHLOFF, B.R. Alpha adrenergic blocking agents: Antinociceptive activity and enhancement of morphine-induced analgesia. The Journal of Pharmacology and Experimental Therapeutics 189(1): 72-82 (April, 1974).

For abstract, see Section II. Drug Chemistry and Metabolism.

CISIN, I.H. and MANHEIMER, D.I. Marijuana use among adults in a large city and suburb. Annals of the New York Academy of Sciences 191: 222-234 (December, 1971)

CLARK, L.D. Behavioral effects of marihuana: Experimental studies. Archives of General Psychiatry 23: 193-198 (1970)

The effects of marihuana on the performance of human subjects under laboratory conditions were studied. Evidence has been presented that marihuana intoxication has significant effects on complex reaction time, recent memory recall and comprehension of written information, and accuracy of time estimation. It is suggested that processes involved in selective perception, immediate recall of preceding thoughts in order to keep on track, and capacity for goal directed systematic thinking are particularly sensitive to relatively low doses of marihuana. Additional research is suggested.

CLARK, L.D. Marijuana and human behavior. Rocky Mountain Medical Journal 69(1): 43-46 (January, 1972)

Much of the confusion about marijuana can be resolved by recognizing the dosage problem. When the amount of tetrahydrocannabinol (THC) present in the cannabis preparation and the nonpharmacologic variables is taken into account, reasonable predictable dose-effect relationships can be identified. In studies conducted for the Mayor's report of 1944 marijuana was found to produce significant dose related impairment of static equilibrium, hand steadiness, and complex reaction. No significant changes were found in hand strength, auditory acuity, perception of length of lines on aper, or tapping speed. With severe dependence, the user's time is increasingly taken up with drug seeking behavior and periods of intoxication, resulting in a proportionate decline in productive social and economic activity. Preliminary studies of these users show that some have significant deficits in tests involving recent memory, tracking or sequential thinking, concept formation tasks, and solution of novel problems. The full impact of the massive drug exposure of youth during the 60's might not be adequately assessed for another decade.

CLARK, L.D. and NAKASHIMA, E.N. Experimental studies of marihuana. American Journal of Psychiatry 125(3): 379-384 (1968)

This preliminary study designed to extend knowledge of the behavioral toxicity of marihuana illustrates some of the problems involved in measuring the effects of psychoactive drugs. Marihuana in gelatin capsules was administered to volunteer graduate students in psychology and biomedical sciences. No SS had smoked marihuana but most had used alcohol socially. A number of performance tests, such as mirror tracing and depth perception, proved insensitive to marihuana in the doses used. Effects on complex (choice) reaction time and on a digit code memory task were most consistently impaired, but there were marked individual differences. A major difficulty in assessing the effects of marihuana is the high level of inter and intra subject variability. Wide oscillations in magnitude of dose effects appear to be particularly characteristic of this drug.

COHN, M.L. Acute behavioral changes induced in the rat by the intracerebroventricular administration of thyrotropin releasing factor (TRF) and somatostatin. Proceedings of the Society of Toxicology, Williamsburg, Virginia, March 9-13, 1975.

COHN, M.L. Cyclic AMP, thyrotropin releasing factor (TRF) and somatostatin-key factors in the regulation of the duration of narcosis. Molecular Mechanisms on Anesthesia. Edited by B.R. Fink. New York: Raven Press, 1975.

COHN, M.L. Dibutyryl cyclic AMP - an antidote to hypnotic, sedative and tranquilizer overdosage in the rat. Toxicology and Applied Pharmacology 25: 439 (1973)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

COHN, M.L. The influence on amobarbital-induced sleeping time in rats by drugs affecting cyclic AMP. Prostaglandins and Cyclic AMP. Biological Actions and Clinical Applications. Edited by R.H. Kahn and W.E.M. Lands. New York: Academic Press, 1971. Pp. 73-74.

For abstract, see Section III. Mechanisms of Action of Different Drugs.

COHN, M. L. and COHN, M. Antianesthetic effects of cyclic AMP and analeptic drugs as determined by reversal of amobarbital-induced narcosis. Proceedings of the Society for Toxicology, Washington, D.C., March 10-14, 1974.

COHN, M. L. and COHN, M. "Barrel rotation" induced by intracerebroventricular injection of somatostatin in the nonlesioned rat. Proceedings of the American Society of Pharmacology and Experimental Therapeutics, Atlantic City, New Jersey, April 13-18, 1975.

COHN, M. L. and COHN, M. Norepinephrine -- an antagonist of dibutyryl cyclic AMP in the regulation of narcosis in the rat. Federation Proceedings 33: 494 (1974)

Dibutyryl cyclic AMP dose-relatedly shortened the duration of amobarbital-induced narcosis (Cohn et al., Neuropharm. 12:73). Norepinephrine (NE) potentiated the duration of amobarbital-induced narcosis. NE has been shown in vitro to stimulate adenyl cyclase production in slices of tissue from various areas of brains of many species. Cyclic AMP is considered as the intracellular mediator of NE in the brain. In the present study, we investigated further the divergent observations which showed that in vivo NE potentiates which cyclic AMP antagonizes barbiturate-induced narcosis. Male Sprague-Dawley rats weighing 85-125 g were injected IP with amobarbital 80 mg/kg. Upon loss of the righting reflex, groups of rats were injected into the right lateral ventricle of the brain with varying doses of NE (50-300 mu-g) and dibutyryl cyclic AMP (90-240 mu-g). The addition of dibutyryl cyclic AMP to NE reduced the duration of narcosis potentiated by the latter but did not alter NE-induced toxic symptoms. Phentolamine dose-relatedly blocked the shortening due to dibutyryl cyclic AMP but did not alter the NE-induced prolongation of the duration of narcosis, although it blocked the toxic symptoms. The lack of analogy between the behavioral effects of exogenously administered NE and dibutyryl cyclic AMP challenges the concept that the action of NE is mediated in the brain uniquely through a second messenger system.

COHN, M. L. and COHN, M. Phentolamine - an antagonist of cyclic AMP regulation of narcosis. Proceedings of the Society for Neurosciences, San Diego, California, November 7-10, 1973.

COHN, M. L. and COHN, M. The role of thyrotropin releasing factor and cyclic AMP in the duration of amobarbital-induced narcosis. Proceedings of the Society for Neurosciences, St. Louis, Missouri, October 20-23, 1974.

COHN, M. L. and COHN, M. Thermoregulatory control in the rat anesthetized with amobarbital. Role of thyrotropin releasing factor. Proceedings of the American Society of Anesthesiologists, Washington, D.C., October 12-16, 1974.

COHN, M.L., COHN, M. and TAYLOR, F.H. Norepinephrine - an antagonist of dibutyryl cyclic AMP in the regulation of narcosis in the rat. Research Communications in Chemical Pathology and Pharmacology 7: 687-699 (1974)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

COHN, M.L., KRAYNACK, B., COHN, M. and SCATTAREGIA, F. Interaction of cyclic AMP with neuropharmacologic depressant agents. Federation Proceedings 32: 680 (1973)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

COHN, M.L., TAYLOR, F., COHN, M. and YAMAOKA, H. Dibutyryl cyclic AMP -- an effective antidote against lethal amounts of amobarbital in the rat. Research Communications in Chemical Pathology and Pharmacology 6: 435-446 (1973)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

COHN, M.L., YAMAOKA, H., TAYLOR, F.H. and KRAYNACK, B. Action of intracerebroventricular dibutyryl cyclic AMP on amobarbital anesthesia in rats. Neuropharmacology 12: 401-405 (1973)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

COHN, R.A., BARRATT, E.S. and PIRCH, J.H. Marijuana responses in rats: Influence of castration or testosterone. Proceedings of the Society for Experimental Biology and Medicine 146: 109-113 (1974)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

COHN, R.A., WILLIAMS, R.J., NASH, I.B. and PIRCH, J.H. Distribution of ^{14}C-delta-9-THC in male and female rats. The Pharmacologist 16: 260 (1974)

For abstract, see Section II. Drug Chemistry and Metabolism.

COLASANTI, B. and KHAZAN, N. Agonistic properties of narcotic analgesics and antagonists on the electroencephalogram and behavior in the rat and their reversal by naloxone. Neuropharmacology 12: 619-627 (1973)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

COLASANTI, B. and KHAZAN, N. Antogonism of the acute electroencephalographic and behavioral effects of morphine in the rat by depletion of brain biogenic amines. Neuropharmacology 12: 463-469 (1973)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

COLASANTI, B. and KHAZAN, N. Imipramine-induced changes in the rapid eye movement sleep rebound and wet dog shakes of morphine-abstinent rats. Neuropharmacology (in press)

COLASANTI, B. and KHAZAN, N. Interactions of narcotic analgesics and antagonists on the electroencephalogram (EEG) and behavior of the rat. Federation Proceedings 31: 304 (1972)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

COOK, J.D. and SCHANBERG, S.M. The effects of methamphetamine on behavior and on the uptake, release and metabolism of norepinephrine. Biochemical Pharmacology 19: 1165-1179 (1970)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

COOPER, B.R. and BREESE, G.R. Relationship of dopamine neural systems to the behavioral alterations produced by 6-hydroxydopamine administration into brain. Neuropsychopharmacology of Monoamines and Their Regulatory Enzymes. Edited by E. Usdin. New York: Raven Press, 1974.

COOPER, B.R., COTT, J.M. and BREESE, G.R. Effects of catecholamine-depleting drugs and amphetamine on self-stimulation of brain following various 6-hydroxydopamine treatments. Psychopharmacologia 37: 235-248 (1974)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

COOPER, S., COON K., MEJTA, C. and REID, L. Methods of deconditioning avoidance: Amphetamine, chlorpromazine and chlordiazepoxide as adjuncts to response prevention. Physiological Psychology 2: 519-522 (1974)

Rats were given extended avoidance training in an automated one-way avoidance chamber, a chamber with a retractable ledge. After training and footshock termination, some rats were prevented from responding by being trapped on the footshock grid with the ledge removed. During this response prevention rats were under the influence of either amphetamine, chlorpromazine,chlordiazepoxide or a placebo. Subsequently, rats were tested for continuance of responding when footshock no longer occurred. Only response prevention with amphetamine reduced persisting avoidance responding compared to no treatment.

COUSENS, K. and DiMASCIO, A. (-)-Delta-9-THC as an hypnotic. Psychopharmacologia 33: 355-364 (1973)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

COUSSENS, W.R., CROWDER, W.F. and DAVIS, W.M. Morphine induced saccharine aversion in alpha-methyltyrosine pretreated rats. Psychopharmacologia 29: 151-157 (1973)

For abstract, see Section I. Methodology of Drug Research.

CROWDER, W.F., SMITH, S.G., DAVIS, W.M., NOEL, J.T. and COUSSENS, W.R. Effect of morphine dose size on the conditioned reinforcing potency of stimuli paired with morphine. The Psychological Record 22: 441-448 (1972)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

CROWLEY, T.J. Dose-dependent facilitation or suppression of rat fighting by methamphetamine, phenobarbital, or imipramine. Psychopharmacologia 27: 213-222 (1972)

To clarify the effects of different doses of methamphetamine HCl, Na phenobarbital, and imipramine HCl on aggressive behavior, the drugs were administered to pairs of rats trained to regularly fight on an electric shock grid. Fighting time and motor activity were measured during the shock sessions. Each drug was given to a different group of rats, in the following doses (mg/kg i.p.): methamphetamine HCl 0, 0.25, 0.50, 1, 2, and 4; Na phenobarbital 0, 5, 10, 20, 40, and 80; imipramine HCl 0, 2.5, 5, 10, and 20. At lower doses methamphetamine and phenobarbital both stimulated fighting behavior, and at higher doses both reduced it. Motor activity rose above control with lower doses of both of these drugs; it fell markedly with higher doses of phenobarbital, while remaining elevated at higher doses of methamphetamine. Imipramine reduced fighting time at higher doses. The results show that, depending upon the dose, the "stimulant," methamphetamine, and the "sedative," phenobarbital, can both increase or decrease aggressive behaviors. Together with previous animal studies, these findings fit with clinical observations that amphetamines and barbiturates can increase aggressive behavior, and suggest that dose may be important in that increase.

CROWLEY, T.J. The reinforcers for drug abuse: Why people take drugs. Comprehensive Psychiatry 13(1): 51-62 (January, 1972)

Drug-abuse behavior may be maintained by reinforcement of the following types: (1) primary positive; (2) primary negative (a) by termination of withdrawal; (b) by reducing attention to, or discrimination of, aversive stimuli); (3) secondary positive (a) social and unrelated to drug effects; (b) social and related to drug effects; (c) chaining; and (4) secondary negative.

Which type of reinforcement functions to maintain drug-abuse behavior appears to depend partly upon the class of drugs employed. The following drug classes are discussed in terms of the reinforcers maintaining their abuse: narcotics, stimulants, sedative-hypnotics and alcohol, hallucinogens and marijuana, and placebo.

Different treatment modalities are aimed at different types of reinforcement. Using narcotic abuse as an example, methadone maintenance, detoxification, and traditional psychotherapy are discussed in terms of their effect on each of the types of reinforcement maintaining the drug habit.

CROWLEY, T.J. and RUTLEDGE, C.O. Chronic methamphetamine, imipramine and phenobarbital effects on shock-induced aggression in rats. Drug Addiction: Neurobiology and Influences on Behavior, Vol. 3. Edited by J.M. Singh and H. Lal. New York: Stratton Intercontinental Medical Book Company, 1974.

Our results indicate that chronically administered drugs may selectively (1) alter the unconditioned fighting response to a potent aversive stimulus, (2) alter conditioning processes that facilitate enhanced fighting responses to repeated aversive stimuli, (3) alter the probability of occurrence of passive vs. aggressive responses to a submaximal aversive stimulus and (4) alter the probability of active escape from an aversive stimulus.

CROWLEY, T.J., STYNES, A.J., HYDINGER, M. and KAUFMAN, C. Ethanol, methamphetamine, pentobarbital, morphine, and monkey social behavior. Archives of General Psychiatry 31: 829-838 (December, 1974)

We find significant dose-response curves for social behaviors after single-dose administration of drugs in five adult male monkeys living in their "home" troop of about 30 animals. Ethanol (0 to 2 ml/kg, gavage) produced ataxia without motor slowing, regressive playful fighting typical of juveniles, and a substantial increase in the ratio of heterosexual to autosexual behaviors. Aggressive dominance behavior was not altered. Pentobarbital sodium (0 to 1 mg/kg, intramuscularly) reduced submission behaviors, increasing the dominance-to-submission ratio. Methamphetamine hydrochloride (0 to 0.5 mg/kg intramuscularly) decreased the dominance-to-submission ratio, while producing hyperactivity, stereotypies, and social unrelatedness. Morphine (0 to 0.4 mg/kg, intramuscularly) blocked sexual behavior without impairing motor activity.

The results may help to clarify some controversies arising from conflicting data in studies of drug effects on humans.

CULVER, C.M. and King, F.W. Neuropsychological assessment of undergraduate marihuana and LSD users. Archives of General Psychiatry 31: 707-711 (November, 1974)

An extended battery of neuropsychological tests was administered to three groups of college seniors (lysergic acid diethylamide /LSD/ /mescaline users; marihuana/hashish users; and controls) who were matched on predrug usage intellectual and personality dimensions. The study was replicated one year later. In the combined-years' analyses, the three groups showed statistically significant differences only on the Trail Making Test: LSD/mescaline users performed within normal limits but significantly worse than either of the other two groups. Since the three groups also differed significantly in the extent of their alcohol usage, a covariance analysis was carried out that indicated that this variable did not account for the LSD/mescaline group's performance on the Trail Making Test. Inference about possible organic dysfunction cannot be drawn from these findings, but prospective neuropsychological testing might prove useful.

DAHLBERG, C.C. LSD facilitation of psychoanalytic treatment: A case study in depth. The Use of LSD in Psychotherapy and Alcoholism. Edited by H.A. Abramson. New York: Bobbs-Merrill, 1967.

This is a detailed report of a psychoanalysis in which LSD 25 was used as a facilitating agent. While the treatment was not complete, it was far superior to non-LSD treatment with this man. He was especially difficult to treat because he had three mothering persons in his life, two of whom were in active conflict. He had a highly ambivalent identification with an inadequate father and he was saddled with a rigid, interlocking system of isolating, destructive defenses.

DAHLBERG, C.C. Sexual behavior in the drug culture. Medical Aspects of Human Sexuality 5(4): 64-71 (April, 1971)

DARLEY, C.F., TINKLENBERG, J.R., HOLLISTER, L.E. and ATKINSON, R.C. Marihuana and retrieval from short-term memory. Psychopharmacologica 29: 231-238 (1973)

Twelve subjects received an oral dose of marihuana extract calibrated to 20 mg of delta-1-tetrahydrocannibinol on Day 1 of the experiment and performed a short-term memory task before and after administration of the drug. The subjects were then split into two groups, receiving either marihuana or placebo on the evenings of Days 1 to 4 and between two memory test sessions on Day 5. Placebo subjects showed little change in performance between the two test sessions on Day 5; however, results from Day 1 for all subjects and Day 5 for the drug group showed that reaction time increased from before- to after-challenge sessions. This increase in time under marihuana was explained as a change in encoding and/or response processes, rather than processes involved in the search of the memory store.

DARLEY, C.F., TINKLENBERG, J.R., ROTH, W.T., HOLLISTER, L.E. and ATKINSON, R.C. Influence of marihuana on storage and retrieval processes in memory. Memory and Cognition 1(2): 196-200 (1973)

Following presentation and immediate free recall testing of 10 20-word lists, 48 Ss were divided into two groups, one of which received an oral dose of marihuana extract calibrated to 20 mg of delta-1-THC and one of which received placebo. One hour later, all Ss were administered delayed recall, recognition, and order tests on the first set of words. Presentation of another set of 10 lists followed, and there were immediate recall and delayed recall recognition, and order tests on these words. Performance of drug and placebo Ss did not differ significantly for any of the first delayed tests. However, the performance of drug Ss was poorer than that of placebo Ss on immediate recall, delayed recall, and delayed recognition of the second set of lists. We concluded that retrieval of information relevant to the occurrence or nonoccurrence of an event was not affected by marihuana intoxication. Storage difficulties probably account for memory deficits due to the drug, and these difficulties appear to occur in the process of transferring information from short-term to long-term memory.

DAVIS, M. and SHEARD, M.H. Biphasic dose-response effects of n-n-dimethyltryptamine on the rat startle reflex. Pharmacology Biochemistry and Behavior 2: 827 (1974)

DAVIS, M. and SHEARD, M.H. Effects of lysergic acid diethylamide (LSD) on habituation and sensitization of the startle response in the rat. Pharmacology Biochemistry and Behavior 2: 675-683 (1974)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

DAVIS, T.R., KENSLER, C.J. and DEWS, P.B. Comparison of behavioral effects of nicotine, d-amphetamine, caffeine and dimenthylheptyl tetrahydrocannabinol in squirrel monkeys. Psychopharmacologia 32: 51-65 (1973)

The effects in squirrel monkeys of nicotine, d-amphetamine, caffeine and dimethylheptyl tetrahydrocannabinol have been examined in three standard behavioral procedures: Fixed Interval, Fixed Ratio and Continuous Shock Avoidance, and two procedures developed to test neuromuscular performance: Physical Activity and Steadiness. Nicotine increased responding in the first half of Fixed Intervals and in Continuous Avoidance; d-amphetamine increased responding under all procedures except Physical Activity; caffeine increased responding under all procedures except Fixed Ratio and DMHP increased responding under all procedures except Fixed Ratio and DMHP increased responding under all procedures except Continuous Avoidance, where responding was reduced. Nicotine and d-amphetamine caused disruption in the Physical Activity procedure. Thus the different procedures revealed different aspects of the behavioral effects of the drugs. Findings are consistent with interpretation that it is the temporal pattern of the responding under the different procedures that is the dominant factor in determining the behavioral effects of the drugs.

DAVIS, W.M., BABBINI, M., COUSSENS, W.R., SMITH, S.G. and CROWDER, W.F. Antagonism of behavioral effects of morphine by alpha-methyltyrosine (AMT). The Pharmacologist 13(2): 280 (1971)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

DAVIS, W.M., BABBINI, M. and KHALSA, J.H. Antagonism by alpha-methyltyrosine of morphine induced motility in non-tolerant and tolerant rats. Research Communications in Chemical Pathology and Pharmacology 4(2): 267-279 (1972)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

DAVIS, W.M. and BORGEN, L.A. Effects of cannabidiol and delta-9-tetrahydrocannabinol on operant behavior. Research Communications in Chemical Pathology and Pharmacology 9(3): 453 (1974)

Studies were conducted concerning the effects of cannabidiol (CBD), a relatively inactive constituent of cannabis, on behavioral actions of delta-9-tetrahydrocannabinol (delta-9-THC). CBD pretreatment in both rat (25 mg/kg) and pigeon (50 mg/kg) significantly reduced the depressant effects of delta-9-THC (1-3 mg/kg) on variable-interval and fixed-interval schedules of food-reinforced operant behavior. The doses of CBD employed had no effect on the behavioral parameters, although higher doses did produce behavioral inhibition. The data suggest that cannabidiol may function as a partial agonist in relation to certain effects of delta-9-THC.

DAVIS, W.M. and BORGEN, L.A. Tolerance development to the effects of delta-9-THC on conditioned behavior: Role of treatment interval and influence of microsomal metabolism. Archives internationales de Pharmacodynamie et de Therapie (in press)

DAVIS, W. M. and BRISTER, C. C. Acute effects of narcotic analgesics on behavioral arousal in the rat. Journal of Pharmaceutical Sciences 62(6): 974-979 (June, 1973)

Locomotor activity measured by photocell actometers was taken as an index of behavioral arousal in rats following acute administration of pentazocine, morphine, methadone, levorphanol, and meperidine. The intraperitoneal doses tested were 1.25, 2.5, 5.0, 10, and 20 mg/kg. The low doses of morphine and methadone and an intermediate dose of pentazocine produced an early (1st hr.) increase in motility. Higher doses of these drugs three drugs and the lowest dose of levorphanol caused a delayed excitation (2nd-3rd hr.) An early inhibition of activity was seen for the higher doses of morphine, methadone, meperidine, and levorphanol but not for pentazocine. Meperidine did not elicit significant locomotor excitation in these doses. The enhanced motility after pentazocine and the narcotic analgesics was blocked by pretreatment with alpha-methyltyrosine.

DAVIS, W. M., HOLBROOK, J. M. and BABBINI, M. Differential effects of morphine on active avoidance as a function of pre-drug performance. Pharmacological Research Communications 5(1): 47-53 (1973)

The effects of morphine sulfate (10, 20, 40 mg/kg) on performance of a one-way avoidance response were determined for drug-naive rats showing low, medium, and high levels of pre-drug performance after equal training. Performance was enhanced significantly from initially low levels and was depressed from initially high levels. Log dose-effect relationships were linear over the range tested, the former effect decreasing and the latter increasing. The enhancement did not extend beyond the day of drug treatment.

DAVIS, W. M. and KHALSA, J. H. Increased shock induced aggression during morphine withdrawal. Life Sciences 10: 1321-1327 (1971)

Spontaneous fighting and footshock-induced aggression of male Wistar rats were recorded before and during morphine administration to produce dependence, and after withdrawal. The morphine dependent rats showed spontaneous fighting on the 3rd through 5th days of withdrawal. However, application of footshock during morphine withdrawal enabled the detection of increased aggressiveness from the 2nd day through the 12th day after the last injection of morphine. This method thus detected a considerably more protracted enhancement of aggression by withdrawal than has been reported previously. In this way it proved superior to simply recording spontaneous aggression, and at the same time it gave a reduced variability compared to the high level seen with measures of spontaneous aggression.

DAVIS, W. M. and KHALSA, J. H. Some determinants of aggressive behavior induced by morphine withdrawal. Psychonomic Science 24(1): 13-15 (1971)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

DAVIS, W.M. and LIN, C.H. Prenatal morphine effects on survival and behavior of rat offspring. Research Communications in Chemical Pathology and Pharmacology 3(2): 205-214 (March, 1972)

Female Holtzman rats were injected (sc) from days 5 through 18 of pregnancy with morphine sulfate or saline solution. The morphine was increased from a single daily dose of 15 mg/kg to a final dose of 45 mg/kg. While no difference was seen in litter numbers, morphine offspring weighed significantly less at birth and their perinatal mortality was significantly greater. Ambulation and rearing, but not elimination, were increased for morphine offspring in the open field test at 1 and $2\frac{1}{2}$ months of age. Audiogenic seizure responses of morphine and control offspring did not differ significantly in incidence. It is suggested that this research may provide an animal model for the human experience of illicit use of opiates during pregnancy.

DAVIS, W.M. and SMITH, S.G. Alpha-methyltyrosine to prevent self-administration of morphine and amphetamine. Current Therapeutic Research 14(12): 814-819 (1972)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

DAVIS, W.M. and SMITH, S.G. Behavioral control exerted by an amphetamine based conditioned reinforcer. Clinical Toxicology 7: 272-273 (1974)

The behavioral control observed with dependence on stimulant drugs results not only from their pharmacologic actions, but also from the reinforcing contingencies maintaining the drug self-administration. Contingencies related to stimulant self-administration have been investigated relative to primary reinforcement, but similar data are not available concerning conditioned (secondary) reinforcement. To obtain data on this important subject, four experiments were conducted: Experiment 1 paired a buzzer with response-contingent intravenous infusions of amphetamine sulfate (AM) in a dosage of 15 mu-g/kg; Experiment 2 utilized Pavlovian pairings of the buzzer and AM to determine if the response contingency was necessary for the development of acquired reinforcer power; Experiment 3 tested whether conditioned motor facilitation or stereotypic behavior could account for increased lever-pressing; Experiment 4 was to discriminate the element in the acquired reinforcer that actually controlled behavior, buzzer or infusion stimuli.

The results indicated that the buzzer acquired reinforcer potency in both the operant and Pavlovian paradigms. Controls for conditioned or unconditioned motor facilitation and for conditioned stereotypic behavior indicated that such factors did not contaminate the present findings. Finally, data confirmed that the stimulus element in the acquired reinforcer that exerted stimulus control over lever-pressing behavior was the buzzer. The results were analyzed in terms of the behavior mechanism responsible for acquisition and maintenance of the acquired reinforcer control.

DAVIS, W.M. and SMITH, S.G. Blocking effect of alpha-methyltyrosine on amphetamine based reinforcement. Journal of Pharmacy and Pharmacology 25: 174 (1973)

DAVIS, W.M. and SMITH, S.G. Blocking of morphine based reinforcement by alpha-methyltyrosine. Life Sciences 12: 185-191 (1973)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

DAVIS, W.M. and SMITH, S.G. Central cholinergic influence on self-administration of morphine and amphetamine. Life Sciences 16: 237-246 (1974)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

DAVIS, W.M. and SMITH, S.G. Naloxone use to eliminate opiate-seeking behavior: Need for extinction of conditioned reinforcement. Biological Psychiatry 9(2): 181-189 (1974)

Naive rats were trained to bar-press for an intravenous infusion of morphine. A sound stimulus (buzzer) was superimposed on the interval of drug infusion for its establishment as a conditioned reinforcer. In one experiment the bar-press response was extinguished by substituting saline for morphine with or without the buzzer present. Replacing the buzzer produced a large recovery of bar-pressing (i.e., drug-seeking behavior) the buzzer had been removed during the extinction period, but had no effect if the buzzer had been present. A second parallel experiment demonstrated that extinction of bar-pressing also could be achieved through pretreatment with the narcotic antagonist naloxone, rather than by substituting saline for morphine. The effect of the buzzer was the same as in the first experiment. These results emphasize the need to eliminate stimulus control exerted both by the primary pharmacological reinforcer and by conditioned reinforcers in treatment regimens which seek to eliminate opiate-dependence by use of drugs which block reinforcement.

DAVIS, W.M. and SMITH, S.G. Noradrenergic basis for reinforcement associated with morphine action in nondependent rats. Clinical Toxicology 7: 265 (1974)

DAVIS, W.M. and SMITH, S.G. Noradrenergic basis for reinforcement associated with morphine action in nondependent rats. Drug Addiction: Neurobiology and Influences on Behavior, Vol. 3. Edited by J.M. Singh and H. Lal. New York: Stratton Intercontinental Medical Book Company, 1974.

A dopaminergic receptor blocking agent, haloperidol, and two dopamine beta-hydroxylase inhibitors and depleters of brain norepinephrine, diethyldithiocarbamate and U-14,624, were used in attempts to elucidate the chemical nature of the mechanism subserving the reinforcing effects of morphine in drug-naive rats. This mechanism had been shown previously to depend upon normal function of brain catecholamines by virtue of studies utilizing alpha-methyltyrosine, a tyrosine hydroxylase inhibitor and depleter of both dopamine and norepinephrine. The recent results include a failure of haloperidol to block morphine reinforcement and an effective and seemingly specific inhibition of the reinforcing action of morphine by the two dopamine beta-hydroxylase inhibitors. Therefore, it seems likely that norepinephrine rather than dopamine plays the crucial role in the neurochemistry of morphine reinforcement in nontolerant, nondependent subjects.

DAVIS, W.M. and SMITH, S.G. Positive reinforcing effects of apomorphine, d-amphetamine and morphine: Interaction with haloperidol. The Pharmacologist 16(2): 16 (1974)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

DAVIS, W.M., SMITH, S.G. and CROWDER, W.F. Morphine based conditioned reinforcement. Fifth International Congress on Pharmacology, July 23-28, 1972.

For abstract, see Section III. Mechanisms of Action of Different Drugs.

DEMAREE, R.G. Behavioral measures and related criterion for assessment of outcomes during treatment for drug users in the DARP: 1969-1971 admissions. Evaluation of Treatments. Edited by S.B. Sells. Studies of the Effectiveness of Treatments for Drug Abuse, Vol. 1. Cambridge, Massachusetts: Ballinger, 1974.

DeMELLO, A.C. and CARLINI, E.A. Behavioral observations on compounds found in nutmeg. Psychopharmacologia 31: 349-363 (1973)

Myristicin and elemicin impaired the rope climbing and bar-pressing performance of rats and in mice caused catatonia and decreased motor activity. As measured in rope climbing performance, rats developed tolerance to both myristicin and elemicin. There was cross-tolerance between myristicin and elemicin; neither showed cross-tolerance with either delta-9-THC or mescaline. The activity of myristicin and elemicin and the inactivity of other nutmeg compounds (safrole, eugenol, isoeugenol, methylisoeugenol) were not reflected in the energies of the highest occupied molecular orbital. These quantum chemical calculations also imply that the nutmeg compounds are not especially good electron donors.

DEMENT, W.C., ZARCONE, V.P., HODDES, E., SMYTHE, H. and CARSKADON, M. Sleep laboratory and clinical studies with flurazepam. The Benzodiazepines. Edited by S. Garattini, E. Mussini and L.O. Randall. New York: Raven Press, 1974. Pp. 599-611.

For abstract, see Section III. Mechanisms of Action of Different Drugs.

DENEAU, G.A. The measurement of addiction potential by self-injection experiments in monkeys. Drug Abuse: Current Concepts and Research. Edited by W. Keup. Springfield, Illinois: Charles C. Thomas, 1972. Pp. 73-79.

For abstract, see Section I. Methodology of Drug Research.

DENEAU, G.A. Use of the monkey colony in studies of tolerance and dependence. University of Michigan Medical Center Journal 36: 212-215 (1970)

DENEAU, G.A. and KAYMAKCALAN, S. Physiological and psychological dependence to synthetic delta-9-THC in rhesus monkeys. The Pharmacologist 13(2): 246 (August, 1971)

Six naive monkeys were prepared by i.v. self-administration of THC. No monkey initiated self-administration over a 3 wk period. Automatic injections were then delivered every 6 hours for 1 month at doses increasing from 0.1 to 0.4 mg/kg. Drug effects were: ptosis, blank staring, scratching and docility. Tolerance developed within a few days of each dosage increment. When injections were discontinued, all monkeys showed abstinence signs. Two monkeys then initiated and maintained self-administration of THC. Abstinence signs appeared at 12 hours and lasted 5 days. They were: yawning, scratching, anorexia, piloerection, irritability, biting, licking fingers, pulling hair, tremors, twitches, shaking, sitting in propped-up positions, photophobia and apparent hallucinations (staring in circles, slapping at the cage wall, grasping as if catching flies).

DENEAU, G., YANAGITA, T. and SEEVERS, M.H. Self-administration of psychoactive substances by the monkey. Psychopharmacologia 16: 30-48 (1969)

DEWEY, W.L. Behavioral procedures: An overview. Narcotic Antagonists. Edited by M.C. Braude, L.S. Harris, E.L. May, J.P. Smith and J.E. Villarreal. Advances in Biochemical Pharmacology, Vol. 8. New York: Raven Press, 1973.

For abstract, see Section I. Methodology of Drug Research.

DEWEY, W.L. and HARRIS, L.S. Antagonistic activity of morphine and other narcotics in the mouse locomotor activity test. The Pharmacologist 15(2): 65 (1973)

We have previously reported that an injection of morphine given 1 minute prior to testing antagonized some of the activity of morphine in the mouse or rat tail flick test. An i.p. injection of 10 mg/kg morphine given 9 minutes after the s.c. injection of 20 mg/kg morphine and 1 min. prior to placement of the mice in the activity cage caused significantly less (p less than 0.001) activity than when an injection of water was given 9 minutes after the injection of 20 mg/kg morphine. Similarily, 10 mg/kg morphine reduced the activity induced by either 10 or 30 mg/kg morphine. A second injection of meperidine also reduced the spontaneous activity induced by a prior injection of meperidine. This reduced spontaneous activity was not due to a sedative effect of the injection of the narcotic 1 minute prior to placement of the mice in the cage since morphine did not decrease activity when given after an injection of water. Morphine also did not reduce the increased spontaneous activity induced by a prior injection of d-amphetamine. The narcotic antagonists nalorphine, cyclazocine and pentazocine also reversed the increased spontaneous activity induced by morphine. These data suggest that morphine is not a pure agonist in the mouse spontaneous activity test.

DEWEY, W.L., HARRIS, L.S., HOWES, J.F. and NUITE, J. The effect of various neurohormonal modulators in the activity of morphine and the narcotic antagonists in the tail-flick and phenyquinone tests. The Journal of Pharmacology and Experimental Therapeutics 175(2): 435 (1970)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

DEWEY, W.L., JENKINS, J., O'ROURKE, T. and HARRIS, L.S. The effects of chronic administration of trans-delta-9-tetrahydrocannabinol on behavior and the cardiovascular system of dogs. Archives internationales de Pharmacodynamie et de Therapie 198: 118-131 (1972)

For abstract, see Section II. Drug Chemistry and Metabolism.

DEWS, P.B. Assessing the effects of drugs. Methods in Psychobiology, Vol. 2. Edited by R.D. Myers. New York: Academic Press, Inc., 1972.

In this chapter, methods of assessment of behavioral effects of drugs will be described; only situations where behavior of the more or less intact individual is the dependent variable are covered. Electrophysiological and related methods of assessing drug effects on nervous tissue will not be considered.

DEWS, P.B. The behavioral context of addiction. Psychic Dependence, Bayer-Symposium IV, 1973.

Psychic dependence is schedule-control of drug-taking behavior. The addict is compelled to take his drug because of the relation of the drug-taking to a schedule of reinforcement. The relation can be:

1. The drug itself functioning as a positive reinforcer.
2. Drug-taking being adjunctive behavior to other behavior maintained on a schedule of reinforcement.
3. The drug-taking acquiring positive reinforcing properties because it is appropriately scheduled.
4. Drug-taking postponing aversive withdrawal symptoms.

Relations 1 and 4 are relatively familiar. Relations 2 and 3 are unfamiliar and so are discussed at some length.

It is concluded that the behavioral phenomena of addiction can be accounted for by the operation of normal mechanisms of the organization and control of behavior, even though the outcome is abnormal.

DEWS, P.B. Drug-behavior interactions. Behavioral Analysis of Drug Action. Edited by J.A. Harvey. Glenview, Illinois: Scott, Foresman and Co., 1971. Pp. 9-43.

DEWS, P.B. Drugs in psychology. A commentary on Travis Thompson and Charles R. Schuster's Behavioral Pharmacology. Journal of the Experimental Analysis of Behavior 13: 395-406 (1970)

DEWS, P.B. What is analgesia? Narcotic Antagonists. Edited by M.C. Braude, L.S. Harris, E.L. May, J.P. Smith and J.E. Villarreal. Advances in Biochemical Psychopharmacology, Vol. 8. New York: Raven Press, 1973.

It has not been proved that morphine selectively attenuates the behavioral effects of painful stimulation in either experimental subjects or clinical situations. Morphine affects the behavior of experimental subjects in situations involving painful stimulation and in situations not involving painful stimulation. Morphine attenuates distress in acutely distressed patients whether the distress arises form painful stimulation or for nonpainful causes. Even the familiar effect of morphine on distress may derive its apparent specificity from the selected clinical population on whom the observations are made. Analgesic assays have been contrived to detect activity in drugs called analgesic drugs in the clinic and to differentiate them from drugs called nonanalgesic in the clinic. The assays have proved their value in guiding programs of organic synthesis to valuable new drugs. The assays cannot illuminate the whole behavioral pharmacology of morphine.

DOMINO, E.F. Behavioral and electrophysiological aspects of antianxiety agents. Advances in Neuropsychopharmacology. Edited by O. Vinar, Z. Votava and P.B. Bradley. Amsterdam, the Netherlands: North-Holland Publishing Company, 1971.

Current information on the behavioral and electrophysiological aspects of antianxiety agents such as meprobamate and chlordiazepoxide indicates certain broad similarities to, as well as some differences from, those of barbiturates, especially shorter acting ones like pentobarbital. Precise pharmacological data in animals and man, particularly on the dose-effect comparisons to longer acting barbiturates are surprisingly scarce. In spite of the commerical success of these agents their qualitative superiority to older classes of sedatives has yet to be established. They do of course show many quantitative differences from barbiturates as well as within their own chemical class. It would appear that very mild sedation is their common pharmacological action which makes them clinically useful.

DOMINO, E. F. Effects of narcotic analgesics on sensory input, activating system and output. The Addictive States. Baltimore, Maryland: The Williams and Wilki Company, 1968. Pp. 117-149.

DOMINO, E.F., ALBERS, J.W., POTVIN, A.R., REPA, B.S. and TOURTELLOTTE Effects of d-amphetamine on quantitative measures of motor performance. C Pharmacology and Therapeutics 13: 251-257 (1972)

The effects of 10 mg. of d-amphetamine and a placebo of similar app were determined by means of a battery of quantitative objective measures of r performance in normal volunteers. The medication was administered in a ra double-blind, crossover design on two occasions one week apart. No signific differences between the effects of the medications on resting and sustention tr or precision hole steadiness were found. However, several compensatory tr tasks which required sustained concentration and motor coordination were sig cantly improved with d-amphetamine.

DOMINO, E.F. and CORSSEN, G. Central and peripheral effects of muscarinic choliner blocking agents in man. Anesthesiology 28: 568-574 (1967)

The effects of scopolamine, methscopolamine, atropine, and l-hyoscya were compared in patient-volunteers without premedication, on an equimolar ba on: (1) visually evoked responses (VER), spontaneous EEG activity, and sedati as an index of a central nervous system action; (2) spontaneous heart rate; and dilute citric acid-induced salivary flow. Scopolamine significantly depressed th early components of the VER, which correlated with the state of wakefulness, a caused simultaneous changes in the alpha rhythm of the EEG toward relaxation c sedation. Atropine, l-hyoscyamine, and methscopolamine had no significant eff on the VER and EEG in equimolar doses. Methscopolamine caused the greatest crease in heart rate, followed by atropine and scopolamine, each of which incre the heart rate within two minutes. The scopolamine-induced increase lasted onl 10 minutes, whereas the effect of atropine, l-hyoscyamine, and methscopolamin tinued for 30 minutes or more. Ten to 30 minutes following scopolamine bradyc was observed. Equimolar doses of l-hyoscyamine were more effective than atr in increasing the heart rate. With regard to blockade of salivary flow the follow order of effectiveness was obtained: methscopolamine greater than scopolamine greater than l-hyoscyamine greater than atropine. A dose of l-hyoscyamine con sisting of half the dose of atropine produced about the same effects, indicating th relative ineffectiveness of the d-hyoscyamine fraction of atropine.

DOMINO, E.F. and KRAUSE, R. Cholinesterase activity and mental disease: A literature review. Michigan Mental Health Bulletin 5: 3-18 (1971)

DOMINO, E.F. and OLDS, M.E. Effects of d-amphetamine, scopolamine, chlordiazepo and diphenylhydantoin on self-stimulation behavior and brain acetylcholine. Psy pharmacologia 23: 1-16 (1972)

DOMINO, E.F., RENNICK, P. and PEARL, J.H. Short term neuropsychopharmacologi effects of marijuana smoking in experienced male users. Pharmacology of Can Edited by M. C. Braude and S. Szara. Baltimore, Maryland: University Park P 1975.

DORNBUSH, R.L. The long-term effects of cannabis. Behavioral Effects of Marijuana in Humans. Edited by L. Miller. New York: Academic Press, Inc., 1974.

DORNBUSH, R.L. Marijuana and memory: Effects of smoking on storage. Transactions of the New York Academy of Sciences 36: 94-100 (1974)

Two experiments were conducted to test the hypothesis that smoked marijuana interferes with short-term retention by disrupting the storage phase of the memory process. In the first experiment, information was presented after smoking, and recalled at a later time; in the second experiment, information was presented prior to smoking and recalled after smoking. Ten male students who were experienced users participated in three conditions in each experiment: control (no smoking); placebo (THC-delta-9-free marijuana); and marijuana (= 20 mg THC-delta-9).

DORNBUSH, R.L., CLARE, G., ZAKS, A., CROWN, P., VOLVAKA, J. and FINK, M. 21-day administration of marijuana in male volunteers. Current Research in Marijuana. Edited by M. Lewis. New York: Academic Press, Inc., 1972.

DORNBUSH, R.L., FINK, M. and FREEDMAN, A.M. Marijuana, memory, and perception. American Journal of Psychiatry 128: 194-197 (1971)

The effect of high and low doses of marijuana on behavioral and physiological responses was studied in male medical school volunteers. Short-term memory, reaction time, EEG, and heart rate were significantly affected by the higher doses; time estimation and blood sugar were not differentially affected by either dose.

DORNBUSH, R.L. and KOKKEVI, A. The acute effects of various cannabis preparations on perceptual, motor and cognitive functions. Proceedings of the International Conference on the Pharmacology of Cannabis. Baltimore, Maryland: University Park Press (in press)

DOUGHERTY, J.A. and PICKENS, R. Fixed interval schedules of cocaine self-administration in the rat. Committee on Problems of Drug Dependence. Washington, D.C.: National Academy of Sciences, National Research Council, 1972. P. 233.

The effects of infusion dose and interval length were examined in fixed interval schedules of i.v. cocaine self-administration in two rats. Infusion doses of .32, .48, and .64 mg/kg, and fixed interval lengths of 200, 300 and 400 seconds were used. Overall response rate was inversely related to infusion dose, and directly related to interval length. Both effects could be explained by changes in the post-reinforcement pause, which varied directly with infusion dose but which was insensitive to variations in interval length (reinforcement frequency). The index of curvature of responding within each fixed interval varied directly with infusion dose as a result of changes in the post-reinforcement pause. The index was also inversely related to interval length. The results were interpreted in terms of temporal control of responding by cocaine. Response rate measures which do not consider the temporal control aspects of cocaine and other drugs are inappropriate for assessing the behavioral variables in self-administration situations.

DOWNS, D.A. and WOODS, J.H. Codeine- and cocaine-reinforced responding in rhesus monkeys: Effects of dose on response rates under a fixed-ratio schedule. The Journal of Pharmacology and Experimental Therapeutics 191(1): 179-188 (1974)

Over a wide range of doses, codeine (0.001-1.0 mg/kg/injection) and cocaine (0.001-0.3 mg/kg/injection) both maintained lever-press responding when 30 responses were required for each intravenous injection. Rate of responding for each drug increased to a maximum and then decreased as dose (milligrams per kilogram per injection) increased. Maximum response rate for cocaine (0.003 mg/kg/injection) was over $3\frac{1}{2}$ times greater than the maximum response rate for codeine (0.03 mg/kg/injection). For both drugs, greatest stability of response rates across sessions was obtained at the higher doses, and changes in dose generally produced immediate changes in response rates. Injections of codeine were usually distributed in a negatively accelerated pattern within sessions while injections of cocaine were more evenly distributed. History of cocaine exposure appeared to increase response rates for low doses of cocaine in some monkeys.

DOWNS, D.A. and WOODS, J.H. Effects of morphine, pentazocine, and naloxone on operant responding in monkeys and pigeons. The Pharmacologist 16: 263 (1974)

Lever-pressing in rhesus monkeys and key-pecking in pigeons were maintained under a multiple fixed interval, thirty-response fixed ratio schedule of food reinforcement (MULT F15 FR30). Morphine, pentazocine, and naloxone generally had dose-dependent response rate decreasing effects in fixed interval and fixed ratio components. The order of potency in suppressing responding was morphine greater than pentazocine greater than naloxone except in fixed ratio components in pigeons, where morphine and pentazocine were equipotent. Antagonism of the response rate decreasing effects of morphine by naloxone became more complete as naloxone dose increased. In contrast, antagonism of the response rate decreasing effects of pentazocine by naloxone was greatest at low naloxone doses in monkeys (0.03 mg/kg) and in pigeons (0.01 mg/kg). In both monkeys and pigeons, antagonism by naloxone was less complete at high doses of pentazocine (e.g., 10 mg/kg) than at comparably high doses of morphine.

DOWNS, D.A. and WOODS, J.H. Naloxone: Behavioral paradigms of aversive control. The Pharmacologist 15: 237 (1973)

Lever-pressing by rhesus monkeys was maintained under various fixed-ratio schedules of reinforcement by intravenous delivery of morphine in the presence of one discriminative stimulus. In the presence of a different discriminative stimulus, fixed-ratio responding was maintained by the termination of an intravenous infusion of naloxone and, in other monkeys, by termination of stimuli preceeding naloxone injection or the injection itself. Stable, high rates of responding were maintained by either procedure involving naloxone injections. Following prolonged exposure to naloxone avoidance-escape, responding was rapid enough to avoid virtually all naloxone injections. Moreover, naloxone dose was changed over a 100-fold range without changing response output. When saline was substituted for naloxone, rates of responding decreased only after approximately 16 sessions. Presession injections of morphine resulted in dose-dependent decreases in avoidance-escape rates of responding. Unavoidable, unescapable injections of naloxone superimposed upon avoidance increased response rates. Finally, lever pressing was maintained when the avoidance-escape contingency was eliminated and naloxone was then delivered only as the consequence of responding.

DOWNS, D.A. and WOODS, J.H. Naloxone-maintained schedules of negative reinforcement in morphine-dependent rhesus monkeys. Committee on Problems on Drug Dependence. Washington, D.C.: National Academy of Sciences, National Research Council, 1974. Pp. 826-838.

DRAWBAUGH, R. and LAL, H. Reversal by narcotic antagonist of a narcotic action elicited by a conditional stimulus. Nature 247: 65-67 (January, 1974)

DREW, W.G., KIPLINGER, G.F., MILLER, L.L. and MARX, M. Effects of propranolol on marihuana-induced cognitive dysfunctioning. Clinical Pharmacology and Therapeutics 13(4): 526-533 (July-August, 1972)

Paid male volunteers were allowed to smoke marihuana cigarettes calibrated to deliver a dose of 25 mu-g per kilogram of delta-9-tetrahydrocannabinol (delta-9-THC). All subjects were given propranolol or placebo (administered in a double-blind fashion), in 4 divided doses beginning 24 hours before and ending 2 hours prior to smoking. Marihuana smoking resulted in significant disruption in the recall of narrative material and moderate impairment in performance on a modified version of the Reitan Trail Making test. Stroop-Color Word performance was not affected by marihuana. Propranolol, a beta adrenergic blocking agent, failed to interact with marihuana to reduce its disruptive effects on any of the tests.

DREW, W.G. and MILLER, L.L. Cannabis: Neural mechanisms and behavior - a theoretical review. Pharmacology 11: 12-32 (1974)

For abstract, see Section II. Drug Chemistry and Metabolism.

DREW, W.G. and MILLER, L.L. Differential effects of delta-9-THC on locomotor behavior in activity-wheel-habituated and nonhabituated rats. Pharmacology 9: 41-51 (1973)

The effects of graded doses of delta-9-THC (0, 0.5, 1.5 and 6 mg/kg) on the activity of rats habituated and not habituated to activity wheels were evaluated. The 6-mg/kg dose significantly decreased the number of revolutions made by rats not previously exposed to the wheel when compared with controls. On the other hand, rats exposed to the wheels for 3-hour periods on three consecutive days and then treated on the fourth, exhibited a significant increase in the number of wheel revolutions at the 1.5- and 6-mg/kg doses when compared with controls. This increase in activity persisted in the 6-mg/kg group when a retest was given 24 h later. These results were discussed in terms of the possible action of THC on habituation.

DREW, W.G., MILLER, L.L. and BAUGH, E.L. Effects of delta-9-THC, LSD-25 and scopolamine on continuous, spontaneous alternation in the Y-maze. Psychopharmacologia 32: 171-182 (1973)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

DREW, W.G., MILLER, L.L. and WIKLER, A. Effect of delta-9-tetrahydrocannabinol on the open-field activity of the rat. Psychopharmacologia 23: 289-299 (1972)

Using the open-field activity of the hooded rat as a model of overall activity, the dose-response and time-action effects of doses of delta-9-THC which did not adversely affect spontaneous activity or behavior on appetitively motivated tasks were studied. Subjects received two exposures to an open field one week apart. Prior to the first exposure subjects were treated with small doses of Tween 80-water. At 30 min or 3 h prior to the second exposure subjects were treated with Tween or delta-9-THC in doses which ranged from 0.5-5 mg/kg. Results indicated that delta-9-THC affected various indices of open-field activity such as grooming, sniffing and ambulation differently depending on the time after injection. Rearing and defecation were affected similarly by THC independent of post-injection intervals.

DYKSTRA, L. and McMILLAN, D.E. Shock-intensity adjustment by squirrel monkey under a titration procedure following administration of morphine, nalorphine, pentazocine, propoxyphene, delta-8-tetrahydrocannabinol (delta-8-THC) or chlorpromazine. Federation Proceedings 33: 516 (1974)

For abstract, see Section I. Methodology of Drug Research.

DYKSTRA, L.A., McMILLAN, D.E. and HARRIS, L.S. Antagonism of morphine by long-acting narcotic antagonists. Psychopharmacologia 39: 151-162 (1974)

The effects of three narcotic antagonists, diprenorphine, naltrexone, and naloxone were studied on the schedule-controlled behavior of pigeons. Naltrexone decreased the rate of responding under the FR and FI components of a multiple fixed-interval, fixed-ratio schedule. Naltrexone and diprenorphine were equipotent in blocking the rate-decreasing effects of morphine on schedule-controlled behavior when the antagonists were given immediately before morphine, and both were more potent morphine antagonists than naloxone. Higher doses of all 3 antagonists were required to block the effects of morphine as the time between the administration of the antagonist and morphine increased. Naltrexone provided a slightly better antagonism of morphine than diprenorphine when morphine was given 2 or 6 h after the antagonist and both antagonists had a longer duration of antagonist action than naloxone.

ECHOLS, S.T. and JEWETT, R.E. Effects of morphine on sleep in the cat. Psychopharmacologia 24: 435-448 (1972)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

ELLINWOOD, E.H., JR. "Accidental conditioning" with chronic methamphetamine intoxication: Implications for a theory of drug habituation. Psychopharmacologica 21: 131-138 (1971)

Methedrine was chronically administered twice a day to a group of cats over a period of eleven days. The stereotyped behavior elicited after injection became increasingly constricted over the eleven days. After Day 1 when the cats were placed in the observation cages just prior to injection, the stereotyped behavior would most often be initiated even before the injection, indicating a conditioning process. The behavior induced, as well as the parameters of reward, appears to fit well the accidental contingencies conditioning paradigm.

ELLINWOOD, E.H., JR. Amphetamine model psychosis: The relationships to schizophrenia. Biological Mechanisms of Schizophrenia and Schizophrenia-like Psychoses. Edited by H. Mitsuda and T. Fukuda. Tokyo, Japan: Igaku Shoin Ltd., 1974. Pp. 89-96.

ELLINWOOD, E. H., JR. Behavioral and EEG changes in the amphetamine model of psychosis. Neuropsychopharmacology of Monoamines and Their Regulatory Enzymes. Edited by E. Usdin. New York: Raven Press, 1974. Pp. 281-297.

In summary, it is important to conceive of psychosis and experimental models of psychoses as developing systems that require time and noting that there are several stages to the development, each characterized by its own type of behavior and organization. In our studies we have been interested in the electrophysiological changes associated with these behavioral states. Although the data are quite preliminary, there are indications that there may be changes in the organization gradients of electrical activity of the forebrain that may be related to the pacemaking activity. Preseizure activity in the olfactory forebrain indicates that electrical waveforms associated with respiration are involved in the elicitation of the responses. There are dramatic changes in the limbic spindle complex associated not only with the states of abnormal arousal but also with the onset of this seizure activity. Arousal concepts may provide the intermediate conceptual bridge for integrating electrophysiological behavioral and pharmacological observations in model psychoses.

ELLINWOOD, E. H., JR. Chronic amphetamine intoxication in several experimental animals. Psychopharmakologie 4: 351 (1971)

ELLINWOOD, E. H., JR. Effect of chronic methamphetamine intoxication in rhesus monkeys. Biological Psychiatry 3: 25-32 (1971)

Rhesus monkeys chronically intoxicated with methamphetamine displayed a much greater repertoire of stereotyped behavior than is noted in lower animals. In general, the form of these patterns was considerably more analogous to the human condition. The most notable stereotype pattern in rhesus monkeys is that involving hand-eye probing and examining movements. These patterns of behavior are directed toward external objects as well as being integrated into grooming responses. The similarities between amphetamine-induced patterns in humans and those observed in rhesus monkeys are discussed. With larger doses of methamphetamine, stereotypes became more constricted, compulsive, and bizarre. Often repeated tics and dyskinesias appeared in the later stages of chronic intoxication.

ELLINWOOD, E. H., JR. and BALSTER, R. L. Rating the behavioral effects of amphetamine. European Journal of Pharmacology 28: 35-41 (1974)

For abstract, see Section I. Methodology of Drug Research.

ELLINWOOD, E. H., JR. and DUARTE-ESCALANTE, O. Behavioral and histopathological findings during chronic methedrine intoxication. Biological Psychiatry 2: 27-39 (1970)

There are specific behavioral changes associated with chronic amphetamine intoxication in man which appear related to changes in arousal systems at several levels in the CNS. This paper presents a correlation between the behavior in cats with chronic administration of methedrine and the histopathological findings of catecholamine distribution in acute intoxication, cats demonstrated an inattention to objects in the immediate environment; they are hyperalert to slight movements or sounds from a distant source, and later develop acute fear responses to any stimuli, as well as continuous circling. With chronic intoxication, a decrease is noted in the above symptoms along with a decrease in tonicity and righting reflexes. The histopathological findings in the CNS are mainly noted in the brain stem. There is a depletion of catecholamine fluorescence in the nerve terminals and neurons located in medial and lateral areas of the brain stem corresponding closely with the position of reticular activating systems and certain cranal nerve nuclei. Changes in serotonin fluorescence and cholinesterase activity, as well as beginning central chromotolysis, are also described.

ELLINWOOD, E. H., JR. and DUARTE-ESCALANTE, O. Chronic amphetamine effect on the olfactory forebrain. Biological Psychiatry 2: 189-203 (1970)

Previous observations from many sources have indicated the need for a study of olfactory systems during chronic amphetamine intoxication. These observations include the induction of seizures from the omygdala, depletion of catecholamines in the amygdala and septum, and the induction of chronic, repetitive sniffing behavior patterns in lower animals during chronic treatment with methedrine. The present study was designed to examine the effects of acute and chronic methedrine intoxication (15-35 mg/kg per day) on olfactory behavior, electrophysiological activity of the anterior forebrain, and the patterns of catecholamine distribution and depletion. Most cats by the third day of intoxication developed stereotyped, repetitious patterns of sniffing which included a specific cage location. The pattern usually became more constricted on successive days. Electrical activity of the olfactory bulb after methedrine has an increase in the "olfactory burst" wave frequency and remains faster throughout the chronic intoxication. The respiratory "sniffing wave" also increases in frequency of occurrence. A rather marked depletion of catecholamines, but an increase in cholinesterase, is noted during chronic methedrine intoxication. These results are discussed in light of the distribution of catecholamine fibers in olfactory forebrain.

ELLINWOOD, E. H., JR. and DUARTE-ESCALANTE, O. Chronic methamphetamine intoxication in three species of experimental animals. Current Concepts in Amphetamine Abuse. Edited by E. H. Ellinwood, Jr. and S. Cohen. Washington, D. C.: U.S. Government Printing Office, 1972. Pp. 59-68.

The behavior associated with chronic methamphetamine intoxication in rats, cats, and rhesus monkeys has been described. Each animal develops his own specific types of stereotyped behaviors. In the rats and cats, stereotypies appeared early in the period of chronic intoxication and were characterized by constructed sequences of posture and movement. The rhesus monkeys chronically intoxicated with methamphetamine displayed a much wider repertoire of stereotyped behavior, which was, in general, more analogous to the human condition. The most notable stereotype pattern in rhesus monkeys was that involving hand-eye probing and examining movements. In addition to being directed toward external objects, these patterns of behavior were integrated into grooming responses. With larger doses of methamphetamine in monkeys, stereotypies became more constricted, "compulsive," and bizarre. Often repeated tics and dyskinesias appeared.

The similarities between amphetamine-induced patterns of behavior in human being and those observed in rhesus monkeys have been discussed.

ELLINWOOD, E. H., JR. and SUDILOVSKY, A. Behavioral disruption and EEG changes following a combination of methamphetamine and disulfiram. Proceedings of the 5th International Congress on Pharmacology, San Francisco, California, July, 1972.

ELLINWOOD, E. H., JR. and SUDILOVSKY, A. Chronic amphetamine intoxication: Behavioral model of psychoses. Psychopathology and Psychopharmacology. Edited by J. O. Cole, A. M. Freedman and A. J. Friedhoff. Baltimore, Maryland: Johns Hopkins Press, 1973. Pp. 51-70.

Amphetamine psychosis has been repeatedly described as a model for paranoid schizophrenia. Thus, chronic experimental animal studies would be relevant to evaluate not only comparative neurochemical alterations but also to assess psychopathologically related phenomena. We have previously reported on the analogy of behavioral constellations evolving over a period of time in chronically intoxicated cats and monkeys. Drug-induced changes are reevaluated at this time on the basis of behaviors not necessarily consistent with the paramoid model. Attention is drawn to bizarre manifestations (loss of motor initiative, frozen postures, dysjunctive posture and dysynchrony of movements, stereotyped activity, cataleptic phenomena, pupillary changes) known to appear in the catatonic form of the human psychosis as well as in the so called experimental catatonia. A paranoid catatonia continuum is proposed as the "clinical" expression of chronic amphetamine intoxication in lower animals, and the need for earlier observation of the process in humans is stressed. We postulate that perseveration and distortions of postural-motor attitudinal sets are common to both possible pathways of the psychotic process.

ELLINWOOD, E. H., JR., SUDILOVSKY, A. and NELSON, L. M. Behavior and EEG analysis of chronic amphetamine effect. Biological Psychiatry 8(2): 169-176 (1974)

The limbic spindle has been demonstrated in our studies to be sensitive both to the state of abnormal arousal and to changes leading to the bizarre behavioral manifestations in the chronic amphetamine intoxication paradigm. The high-voltage, high-frequency spindle has been associated with epilepitform-like discharges in the rhinencephalon which are, in turn, associated with the bizarre behavior.

ELLINWOOD, E. H., JR., SUDILOVSKY, A. and NELSON, L. Behavioral analysis of chronic amphetamine intoxication. Biological Psychiatry 4: 215-230 (1972)

The assessment of models of psychoses requires a detailed and precise description and quantification of behavioral changes over time. This paper reports some of our methods and results in chronic methamphetamine-intoxicated cats used as their own control. Phenomenological descriptions and recordings on video tape of the ongoing behavior were used in the analysis and construction of indexes of ataxia, dystonic posture, transient and patterned movements, and a multivariate behavioral rating chart. Attention was focused on the dyssynchrony of posture and motility throughout the intoxication period.

ELLINWOOD, E. H., JR. SUDILOVSKY, A. and NELSON, L. M. Evolving behavior in the clinical and experimental amphetamine (model) psychosis. American Journal of Psychiatry 130: 10 (October, 1973)

A parallel is drawn between several behavioral constellations observed in the evolution of the human amphetamine psychosis and the motor-postural-attitudinal manifestations induced in animals by chronic amphetamine intoxication. On the basis of the results reported, a triple-layered model of psychosis is suggested and the roles played by participating neurotransmitters and mechanisms are further elaborated.

ESTRADA, U., VILLARREAL, J.E. and SCHUSTER, C.R. Self-administration of stimulant drugs as a function of the dose per injection. Committee on Problems of Drug Dependence. Washington, D.C.: National Academy of Sciences, National Research Council, 1967. P. 5056.

The ability of amphetamine and cocaine to generate self-administration behavior in rhesus monkeys was first demonstrated by Deneau, Yanagita and Seevers (1965). The self-administration of two other stimulants of the central nervous system has been studied in the experiments to be briefly discussed here -- fencamfamin (2-phenyl-3-ethylaminobicyclo (2,2,1)-heptane) and SPA ((1)-1-2 diphenyl-1-dimethyl-aminoethane). Evidence that the dosage of these drugs is a first-order controlling variable in the pattern of self-administration prompted this preliminary presentation of the findings.

EVANS, H.L. Behavioral effects of methamphetamine and alpha-methyltyrosine in the rat. The Journal of Pharmacology and Experimental Therapeutics 176(1): 244-254 (1971)

Doses of 0.2 and 1.6 mg/kg of methamphetamine (MA) tended to increase low lever-pressing rates and low motor activity levels but were more likely to suppress high-rate lever pressing and motor activity. In addition to this rate dependency, situational variables, such as electric shock, drug dose and time after injection, were also found to influence MA effects. Food intake was reduced only by 1.6 mg/kg of MA. Alpha-methyltyrosine (alpha-MT) in doses of 12.5 to 50.0 mg/kg caused changes in behavior and was observed to potentiate, antagonize or reverse MA effects depending on the variables described above. This suggests that the effects of alpha-MT + MA involve several central nervous system mechanisms. Alpha-MT did not interact with p-chloromethamphetamine.

EVANS, H.L., GHISELLI, W.B. and PATTON, R.A. Diurnal rhythm in behavioral effects of methamphetamine, p-chloromethamphetamine and scopolamine. The Journal of Pharmacology and Experimental Therapeutics 186(1): 10-17 (1973)

Rats were housed and tested under a controlled cycle of 12 hours light-12 hours dark. Effects of drugs on free-operant avoidance and fixed-interval performance varied from enhancement to depression, depending on the stage of the light-dark cycle at which the drug was administered. Methamphetamine produced the greatest increase in lever pressing when administered during the dark period, regardless of whether responding was maintained by food or by electric shock. This effect appeared to be independent of diurnal differences in base-line response rates. Methamphetamine increased locomotor activity at least as much during the light as during the dark, which suggests a dissociation between effects on operant behavior and effects on locomotor activity. Alpha-methyltyrosine was a more effective antagonist of methamphetamine effects in the light than in the dark. Unlike methamphetamine, p-chloromethamphetamine was more effective in increasing responding during the light period. The dose of scopolamine which was most effective in increasing avoidance responding varied from 0.2 mg/kg in the dark to 0.8 mg/kg in the light. Results are discussed with reference to reported diurnal rhythms in behavioral toxicity and in brain amines.

EVANS, M.A., MARTZ, R., BROWN, D.J., RODDA, B.E., KIPLINGER, G.R., LEMBERGER, L. and FORNEY, R.B. Impairment of performance with low doses of marihuana. Clinical Pharmacology and Therapeutics 14(6): 936-940 (November-December, 1973)

Eight volunteers smoked marihuana cigarettes under controlled laboratory conditions on 4 separate occasions. The cigarettes were calibrated to deliver doses of 0, 3, 6, and 9 mu-g per kilogram of delta-9-tetrahydrocannabinol (THC). The experimental design was a double-blind random block with a 1 week interval between sessions. Analysis of variance revealed a significant linear decrease in stability with increase in dose of THC. The tracking scores with Pursuit Meter (PM) demonstrated a significant increase above control for all three doses of THC. Mental performance, as evaluated by Delayed Auditory Feedback (DAF), and subjective evaluation revealed no consistent change with dose.

FAITH, M.E., YOUNG, L.D., GRABARITS, F. and HARVEY, J.A. Differences in the duration of reserpine action in the rat depending on the measure employed. International Journal of Neuropharmacology 7: 575-585 (1968)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

FERGUSON, R.K., ADAMS, W.J. and MITCHELL, C.L. Studies of tolerance development to morphine analgesia in rats tested on the hot plate. European Journal of Pharmacology 8: 83-92 (1969)

Tolerance to the analgesic effect of morphine was studied in rats using the hot plate method. Animals were tested at intervals of 6 hours, 24 hours, 7 days, or 14 days after the same dose of morphine (5 mg/kg s.c.). The degree of single-dose tolerance, measured as the per cent loss of analgesic effect between the first and second tests, was remarkably similar despite the interval between the tests. For all experiments the mean decrease between the first and second tests was 57% (range, 42 to 73%). When either levallorphan (0.5 mg/kg) or nalorphine (0.5 or 5.0 mg/kg) was given before morphine on the first test, it blocked the analgesic effect of morphine. On the last test when the antagonist was omitted, the difference in effect of morphine in the test versus control groups indicated that the antagonist reduced but did not entirely block single-dose tolerance development. This was further suggested by experiments in which levallorphan was given just after testing with morphine.

FERGUSON, R.K. and MITCHELL, C.L. Pain as a factor in the development of tolerance to morphine analgesia in man. Clinical Pharmacology and Therapeutics 10: 372-382 (1969)

An experiment was designed to test the hypothesis that pain is a factor in the development of tolerance to the analgesic effect of morphine in man. Pain was induced by the submaximum-effort tourniquet technique. Four pain ratings were recorded: mild, moderate, severe, and unbearable. Subjects were randomly divided into two major groups: (1) those tested by the tourniquet technique each day and (2) those not tested until the final day. Each major group was randomly divided into two subgroups: (1) those receiving only morphine and (2) those receiving saline for 4 days and morphine on the final day. Morphine or saline was given intravenously. The purpose of the experiment was to compare the degree of tolerance development to chronically administered morphine in the tested versus nontested groups. In the subgroups receiving morphine, analgesia was significantly less in the tested than in the nontested group at the highest pain level. Moreover, in the morphine subgroup of the tested subjects, the degree of tolerance development was proportional to the severity of pain. These findings indicate that pain can augment the development of tolerance to the analgesic effect of morphine in man.

FERRARO, D. P. Effects of delta-9-trans-tetrahydrocannabinol on simple and complex learned behavior in animals. Current Research in Marijuana. Edited by M. F. Lewis. New York: Academic Press, Inc., 1972.

FERRARO, D. P, and GLUCK, J. P. Effects of oral delta-9-tetrahydrocannabinol on operant reinforcement schedule performance in rats. Pharmacology 11: 65-69 (1974)

Eight rats were trained to barpress for water reinforcement under a variable interval 60-sec operant schedule. Nine acute oral administrations of (-) delta-9-trans-tetrahydrocannabinol (delta-9-THC), in amounts ranging from 0.25 to 64 mg/kg, produced dose-related effects on responding; overall response rate increased at lower doses, while higher doses produced a suppression of responding and a corresponding loss of reinforcements. It was concluded that oral delta-9-THC has a biphasic effect on operant behavior in rats which closely resembles that obtained with intraperitoneal drug administrations.

FERRARO, D. P., GLUCK, J. P. and HERNDON, G. B. Acquisition and extinction of variable interval schedule behavior by rats under delta-9-tetrahydrocannabinol. Pharmacology Biochemistry and Behavior 2: 487-491 (1974)

Twenty-eight rats were given 10 acquisition sessions under a variable interval 30 sec schedule of water reinforcement for lever-press responding. This training was followed by one extinction session in which no responses were reinforced. The rats were divided into 4 groups and were administered either 0, 0.5, 2.0 or 8.0 mg delta-9-THC per kg of body weight throughout both variable interval schedule acquisition and extinction. The presence of delta-9-THC during acquisition suppressed variable interval response rates and decreased the number of reinforcements obtained in a dose-related manner. Likewise, a dose dependent decrease in extinction responding was obtained as compared to nondrug control extinction responding.

FERRARO, D. P., GLUCK, J. P. and MORROW, C. W. Temporally-related stimulus properties of delta-9-tetrahydrocannabinol in monkeys. Psychopharmacologia 35: 305-316 (1974)

A two-choice operant discrimination procedure was used to train three monkeys to respond differentially between a fixed dose of delta-9-tetrahydrocannabinol (delta-9-THC) and the drug vehicle alone. During the acquisition of the drug discrimination, both drug and vehicle alone were administered orally 2.5 h prior to the experimental session. The drug-stimulus time course was then tested by administering either the same dose of delta-9-THC or the vehicle alone from 0.5 to 16.5 h before the session. Varying administration time had no effect on the established discrimination during vehicle alone test sessions. However, orderly time-related generalization gradients were obtained around the drug administration time used during discrimination training.

FIBIGER, H. C. and CAMPBELL, B. A. The effect of para-chlorophenylalanine on spontaneous locomotor activity in the rat. Neuropharmacology 10: 25-32 (1971)

The effect of p-chlorophenylalanine (p-CPA), a depletor of serotonin, on spontaneous locomotor activity was investigated in rats. It was found that p-CPA induced large and reproducible increases in locomotor activity in a variety of situations. This hyperactivity could be reversed by 5-hydroxytryptophan, a precursor of serotonin. The heightened behavioral arousal was not simply a reflection of the insomnia known to be produced by p-CPA, since hyperactivity occurred during both phases of the normal diurnal cycle and because baseline activity returned to normal at different rates depending upon the type of behavioral measure used. It is suggested that one function of serotonin is to modulate arousal thresholds and that the hyperactivity following p-CPA was due to a decrease in these thresholds.

FIBIGER, H.C., TRIMBACH, C. and CAMPBELL, B.A. Enhanced stimulant properties of (+)-amphetamine after chronic reserpine treatment in the rat: Mediation by hypophagia and weight loss. Neuropharmacology 11: 57-67 (1972)

Rats were treated with daily i.p. injections of reserpine (0.5 mg/kg) or saline for 10 days. Twenty-four hours after the last injection they were given (+)-amphetamine (0.25, 0.50, or 1 mg/kg) or saline and their locomotor activity was measured for 3 hr. In accordance with previous reports, (+)-amphetamine induced a significantly greater stimulation of spontaneous activity after reserpine. The effect was variable however insofar as it was observed only in those animals that suffered marked weight loss during the reserpine treatment. In addition, when the heightened baseline activity of the groups chronically treated with reserpine was considered, the enhanced stimulant effects of (+)-amphetamine were no longer evident. In a second experiment, the food intake of the chronic saline animals was controlled so that both the reserpine and saline groups underwent similar weight losses during the 10-day injection procedure. In that experiment, chronic reserpine treatment failed on every measure to increase the stimulant effects of (+)-amphetamine. In contrast to the first experiment, on one measure (the lowest dosage which significantly increased activity) the saline pre-treated animals were more responsive to (+)-amphetamine than were the rats pretreated with reserpine. It is suggested that chronic reserpine administration continues to exert a mild sedative action which is completely masked and reversed by the marked increase in arousal which results from the reserpine-mediated hypophagia and weight loss. This starvation-induced arousal appears to interact with amphetamine-mediated locomotor stimulation to produce the increased responsiveness to amphetamine after chronic reserpine treatment.

FINK, M. Brain, behavior and anticholinergic drugs. Anticholinergic Drugs, and Brain Functions in Animals and Man. Edited by P. Bradley and M. Fink. Amsterdam, the Netherlands: Elsevier, 1967. Pp. xii-xvi.

FINK, M. Drugs, EEG, and behaviour: EEG profiles and bioavailability measures for clinical psychopharmacology. Electroencephalography and Clinical Neurophysiology 34: 754 (1973)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

FINK, M. EEG and human psychopharmacology. Annual Review of Pharmacology 9: 241-258 (1968)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

FINK, M. EEG classification of psychoactive compounds in man: Review and theory of behavioral associations. Psychopharmacology: A Review of Progress, 1957-1967. Edited by D. Efron, J. Cole, J. Levine and J.R. Wittenborn. Washington, D.C.: U.S. Government Printing Office, 1968. Pp. 497-507.

For abstract, see Section I. Methodology of Drug Research.

FINK, M. Psychoactive drugs, brain function and human behavior. Proceedings of the World Congress on Psychiatry. Amsterdam, the Netherlands: Excerpta Medica Foundation, 1974.

FINK, M. Questions in cyclazocine therapy of opiate dependence. Opiate Addiction: Origins and Treatment. Edited by S. Fisher and A.M. Freedman. Washington, D.C.: V.H. Winston and Sons, 1974.

FINK, M. Toward a rational theory of behavior. Career Directions in Psychiatry 1: 22-29 (1971)

FINK, M. Treatment and prevention of opiate dependence. Contemporary Drug Problems. Washington, D.C.: Federal Legal Publications, 1972.

FINK, M. and BRADLEY, P. Anticholinergic drugs and brain function in animals and man. Neuropsychopharmacology. Edited by H. Brill. New York: Excerpta Medica Foundation, 1967.

For abstract, see Section III. Mechanisms of Action of Different Drugs.

FINK, M. and ITIL, T. Anticholinergic hallucinogens and their interactions with centrally active drugs. Neuropsychopharmacology. Edited by H. Brill. New York: Excerpta Medica Foundation, 1967.

For abstract, see Section III. Mechanisms of Action of Different Drugs.

FINK, M. and ITIL, T. EEG and behavioral aspects of the interaction of anticholinergic hallucinogens with centrally active compounds. Anticholinergic Drugs, and Brain Functions in Animals and Man. Edited by P. Bradley and M. Fink. Amsterdam, the Netherlands: Elsevier, 1967. Pp. 149-168.

FINK, M., SIMEON, E., ITIL, T. and FREEDMAN, A. Clinical antidepressant activity of cyclazocine - a narcotic antagonist. Clinical Pharmacology and Therapeutics 11(1): 41-48 (1970)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

FINK, M., VOLAVKA, J., DORNBUSH, R. and CROWN, P. Effects of cannabis on human EEG and heart rate -- evidence of tolerance development on chronic use. Psychopharmacology, Sexual Disorders and Drug Abuse. Edited by T.A. Ban, J.R. Boissier, G.J. Gessa, H. Heimann, L. Hollister, H.E. Lehmann, I. Munkvad, H. Steinberg, F. Sulser, A. Sundwall and O. Vinař. Amsterdam, the Netherlands: North-Holland Publishing Company, 1973.

In studies of cannabis smoking in non-naive volunteer users we have observed dose-related EEG increases in alpha activity and decreased beta and theta activities; increased heart rate; and increased errors on memory tasks. In chronic studies, these effects show a progressively smaller response on successive days -- changes that are consistent with the development of tolerance in the classic sense.

FINK, M., ZAKS, A., RESNICK, R. and FREEDMAN, A. Opiate antagonists in the treatment of heroin dependence in man. Narcotic Drugs : Biochemical Pharmacology. Edited by D. Clouet. New York: Plenum Press, 1971.

For abstract, see Section III. Mechanisms of Action of Different Drugs.

FISHER, S., PILLARD, R.C. and BOTTO, R.W. Hypnotic susceptibility during cannabis intoxication. Psychopharmacology, Sexual Disorders and Drug Abuse. Edited by T.A. Ban, J.R. Boissier, G.J. Gessa, H. Heimann, L. Hollister, H.E. Lehmann, I. Munkvad, H. Steinberg, F. Sulser, A. Sundwall and O. Vinař. Amsterdam, the Netherlands: North-Holland Publishing Company, 1973.

FOG, R. Behavioural effects in rats of morphine and amphetamine and of a combination of the two drugs. Psychopharmacologia 16: 305-312 (1970)

Small single doses of morphine (1 mg/kg s.c.) and of amphetamine (1 mg/kg s.c.) induce excitation in rats. Locomotion and rearing are selectively stimulated by amphetaime, and grooming by morphine. Higher doses of morphine (5 mg/kg s.c.) cause sedation or catalepsy (20 mg/kg s.c.) but no stereotypies are seen as after amphetamine (10 mg/kg s.c.). Repeated doses of morphine induce stereotyped behaviour, which is inhibited by nalorphine. An antagonism between morphine and amphetamine is demonstrated but the anti-amphetamine effect of morphine is differnt from that of the neuroleptic drugs. Catecholamines in the basal ganglia may play a role in these behavioural effects of morphine.

FOG, R. On stereotypy and catalepsy: Studies on the effect of amphetamines and neuroleptics in rats. Acta Neurologica Scandinavica 48(Supplement 50) (1972)

FOG, R. Rage reactions produced in rats by a combination of thymoleptics and monoamine oxidase inhibitors. Pharmacological Research Communications 1: 79-84 (1969)

FOG, R. L. Role of the corpus striatum in typical behavioral effects in rats produced by both amphetamine and neuroleptic drugs. Acta Pharmacologica et Toxicologica 25(Supplement 4): 59 (1967)

FOG, R. Stereotyped and non-sterotyped behaviour in rats induced by various stimulant drugs. Psychopharmacologia 14: 299-304 (1969)

In rats amphetamine and closely related drugs (e.g., metamphetamine and phenmetrazine) give rise to stereotyped hyperactivity. Other centrally stimulating agents, which are less chemically related to amphetamine (e.g., pemoline, LSD, methylphenidate) or totally different from amphetamine (e.g., cocaine, KSW 3019) can produce similar behavioural effects. Some drugs with a marked stimulating effect on the nervous system (e.g., caffeine and nikethamide) do not cause any stereotypy at all. The specificity of the feature of stereotypy is discussed, and it is assumed that dopaminergic mechanisms in corpus striatum play an important role in this behavioural effect.

FOG, R. L. and PAKKENBERG, H. Behavioral effects of dopamine and p-hydroxy-amphetamine injected into corpus striatum of rats. Experimental Neurology 31: 75-85 (1971)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

FOG, R. L. and PAKKENBERG, H. Interacerebral lesions causing stereotyped behaviour in rats. Acta Neurologica Scandinavia 47: 475-484 (1971)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

FOG, R. L., RANDRUP, A. and PAKKENBERG, H. Lesions in corpus striatum and cortex of rat brains and the effects of pharmacologically induced stereotyped, aggressive and cataleptic behaviour. Psychopharmacologia 18: 346-356 (1970)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

FOREE, D.D., MORETZ, F.H. and McMILLAN, D.E. Drugs and punished responding. II: D-amphetamine-induced increases in punished responding. Journal of the Experimental Analysis of Behavior 20(2): 291-300 (September, 1973)

The effects of d-amphetamine on punished responding were studied in two experiments. In Experiment I, pigeons responded under a multiple fixed-ratio 30 response fixed-interval 5-min schedule of food presentation with 60-sec limited holds in both components. Each response was punished with electric shock, the intensity of which was varied systematically. In Experiment II, another group of pigeons responded under a multiple fixed-interval 5-min fixed-interval 5-min schedule of food presentation with 40-sec limited holds. Each response was punished with shock during one component, and every thirtieth response was punished in the other component. d-Amphetamine increased overall rates of punished responding only rarely under any of the punishment conditions; however, response rates within the fixed-interval when rates were low were increased by d-amphetamine when the shock intensity was low (Experiment I), or when responses produced shock intermittently (Experiment II). The data suggest that the effects of d-amphetamine on punished responding depend on the control rate of responding, the punishment intensity, the punishment frequency, and the schedule of food presentation.

FRACCHIA, J.F., FIORENTINO, D., SHEPPARD, C. and MERLIS, S. A comparison of techniques for the scoring of avoidable errors on the Raven Progressive Matrices. Journal of Psychology 72: 93-98 (1969)

For abstract, see Section I. Methodology of Drug Research.

FRACCHIA, J., FIORENTINO, D., SHEPPARD, C. and MERLIS, S. Raven Progressive Matrices avoidable errors as a measure of psychopathological ideational influences upon reasoning ability. Psychological Reports 26: 359-362 (1970)

For abstract, see Section I. Methodology of Drug Research.

FREY, L.G. and WINTER, J.C. Effects of p-acetyldeoxyephedrine on punished behavior in the rat. Archives internationales de Pharmacodynamie et de Therapie 201(1): 125-127 (1973)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

GALLAGER, D.W., SANDERS-BUSH, E. and SULSER, F. Dissociation between behavioral effects and changes in metabolism of cerebral serotonin following delta-9-tetrahydrocannabinol. Psychopharmacologia 26: 337-345 (1972)

For abstract, see Section II. Drug Chemistry and Metabolism.

GEBHART, G. F. and MITCHELL, C. L. The effect of adrenalectomy on morphine analgesia and tolerance development in rats. European Journal of Pharmacology 18: 37-42 (1972)

The analegesic response to morphine and the development of tolerance to this effect were examined in adrenalectomized and sham-operated rats employing the hot plate method. In a quantitative 6 point bioassay procedure, morphine was found to be 1.8 times more efficacious in adrenalectomized rats. An analysis of variance of data collected in quantal fashion revealed a complementary relative efficacy of 1.7. The rates of tolerance development to the analgesic effect of morphine over the 5 day period of the experiment were found to be equivalent in both groups of rats at either of 2 equi-analgesic morphine dose levels employed. It was concluded that whereas the effect of adrenalectomy on the analgesic response to morphine is significant, it is insignificant with respect to the rate of tolerance development.

GEBHART, G. F. and MITCHELL, C. L. Further studies on the development of tolerance to the analgesic effect of morphine: The role played by the cylinder in the hot plate testing procedure. Archives internationales de Pharmacodynamie et de Therapie 191: 96-103 (1971)

Evidence that experience in the hot plate test procedure of Johannesson and Woods is sufficient to demonstrate tolerance to the analgesic effect of morphine is offered. Rats were randomly divided into four major groups: tested, non-tested, ambient temperature tested and table top tested. Morphine (5 or 10 mg/kg s.c.) or saline (2 ml/kg s.c.) was administered once daily for 5 days or once weekly for 5 weeks. The results clearly demonstrate that tolerance development to morphine is greater when the animals acquire experience in the test procedure than when morphine is given in the absence of testing. This effect is evident in the weekly experiment irrespective of the method by which experience is acquired (i.e., on the heated plate (55°C), on the plate at ambient temperature (25°C), or on a laboratory bench top). In the daily experiment the same trend was indicated. These findings suggest that in addition to the frequency of morphine administration and the dose, the plexiglas cylinder used to confine the animals to the plate is an important factor in determining the results obtained.

GEBHART, G. F. and MITCHELL, C. L. The relative contributions of the testing cylinder and the heated plate in the hot plate procedure to the development of tolerance to morphine in rats. European Journal of Pharmacology 18: 56-62 (1972)

Tolerance to the analgesic effect of morphine was studied using a 3 ft square hot plate to measure effect. Rats received saline, 2 ml/kg. s.c., or 5 or 10 mg/kg morphine, s.c., once weekly or once daily, respectively. They were randomly divided into 5 major groups: tested with cylinder, tested without cylinder, ambient temperature tested with cylinder, ambient temperature tested without cylinder, and non-tested. On the final day of the experiments, all rats received morphine and were tested on the heated plate within the testing cylinder. The results clearly demonstrated that both the testing cylinder and heat are important factors in determining the results obtained in the hot plate method. Tolerance developed in all cases where the testing cylinder was employed; significantly, this occurred even in those cases where heat was not a factor and the animals acquired experience in the testing cylinder on the plate at ambient temperature. In addition, tolerance developed in all chronic morphine-treated animals tested on the heated plate, even in those cases where only heat was a factor and the testing cylinder was not employed. Most striking was the combined effect of the testing cylinder and heat. In both the daily and weekly experiments, the mean increases in reaction time of the chronic morphine-treated animals were significantly the lowest in those tested in the cylinder on the heated plate. Thus, as well as heat being an important factor, the testing cylinder is demonstrated also to significantly contribute to the degree of tolerance developed with the combination of heat and cylinder being pretotent.

GEBHART, G.F. and MITCHELL, C.L. Strain differences in the response to morphine as measured on the hot plate. Archives internationales de Pharmacodynamie et de Therapie 201: 128-140 (1973)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

GEBHART, G.F., SHERMAN, A.D. and MITCHELL, C.L. The influence of learning on morphine analgesia and tolerance development in rats tested on the hot plate. Psychopharmacologia 22: 295-304 (1971)

The influence of "learning" on the development of tolerance to the analgesic effect of morphine in rats was examined employing the hot plate procedure. A tested-reinforced (Tr) group and its yoked-control, a tested-non-reinforced (Tnr) group, received identical exposure to the testing procedure; the Tr group was reinforced daily for its behavior on the heated plate whereas the Tnr group was reinforced only on the last day of the experiment. Paired statistical comparisons between these two groups on the last day of the experiment revealed that: 1. pre-morphine control reaction times on the heated plate were significantly lower in Tr than in Tnr animals; and 2. post-morphine increases in reaction time did not differ between Tr and Tnr animals. It was concluded that whereas some "learning" does occur in this testing procedure, "learning" does not influence the "behavorial tolerance" to morphine which develops in this analgesiometric method. An hypothesis which accommodates this "behavioral tolerance" and a mechanistic scheme is offered.

GEBHART, G.F., SHERMAN, A.D. and MITCHELL, C.L. The influence of stress on tolerance development to morphine in rats tested on the hot plate. Archives internationales de Pharmacodynamie et de Therapie 197: 328-337 (1972)

Tolerance to the analgesic effect of morphine was studied in rats stressed for four consecutive days and not exposed to testing on the heated plate until the fifth day of the experiment. The analgesic response to morphine in rats tested daily on the hot plate for five consecutive days was significantly lower on day five than that observed in three groups of stressed animals (i.e., restraint stress, auditory stress, and swim stress). In addition, the analgesic response to morphine among these three stressed groups on day five was identical to that observed in rats which received morphine daily but also were not tested on the heated plate until the final day of the experiment. Further, there was significant gastric pathologic changes in the restraint and auditory stressed groups, but not in those animals tested daily on the hot plate. It was concluded that stress per se does not significantly contribute to the results obtained in the hot plate procedure.

GELLER, I. and BLUM, K. The effects of 5-HTP on para-chlorophenylalanine (p-CPA) attenuation of "conflict" behavior. European Journal of Pharmacology 9: 319-324 (1970)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

GELLER, I., HARTMANN, R.J. and BLUM, K. The effects of low-dose combinations of d-amphetamine and cocaine on experimentally induced conflict in the rat. Current Therapeutic Research 14(4): 220-224 (April, 1972)

The findings of this experiment suggest a probable cocaine-amphetamine potentiation since combinations of relatively low doses of the agents produced effects which were generally greater than additive. If the behavioral changes are related to catecholamine metabolism, the observed amphetamine-cocaine synergy might be expected. Both agents have been reported to block uptake of NE in tissues while amphetamine also releases NE. The effect of combining the drugs would have been to increase the availability of free NE with the resulting increase in behavioral effects.

Reduction of shocks during conflict trials may be due in part to a drug-induced "anxiety," a finding which has been reported for humans. Support for this speculation derives from previous research that demonstrated anti-anxiety agents attenuated and amphetamine intensified conflict behavior at dose levels that did not decrease intertrial variable-interval rates significantly.

Despite the fact that further research is required for clarification of the cocaine-amphetamine potentiation mechanism, these findings are of extreme importance in that they point out the potential dangers of indiscriminate poly-drug usage of amphetamine and cocaine, two stimulants that are abused excessively.

GELLER, I., HARTMANN, R.J., CROY, D.J. and HABER, B. Attenuation of conflict behavior with cinanserin, a serotonin antagonist: Reversal of the effect with 5-hydroxytryptophan and alpha-methyltryptamine. Research Communications in Chemical Pathology and Pharmacology (7(1): 165 (January, 1974)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

GELLERT, V.F. and SPARBER, S.B. Utilization of operant technics to assess degree of opiate dependence after pellet implantation and naloxone administration: A comparison with body weight changes. Federation Proceedings 33(3): 501 (1974)

Depression of fixed ratio (RF) responding and weight loss induced by naloxone (Nx) precipitated morphine (M) withdrawal in rats were studied. The operant paradigm consisted of seven 5 min sessions spaced over 5 hr. After stabilization, all rats were implanted s.c. with 1 M pellet (75 mg base). Daily testing sessions were conducted 1 to 6 days after implant with 0.1, 0.33 and 1.0 mg Nx/kg or saline injected i. p. immediately after the daily 5 min control session. Thereafter, semi-weekly testing was conducted with 1.0 mg Nx/kg or saline until all animals showed no signs of withdrawal (35 days after implant). The rats were also weighed after each 5 min session. Nx was able to depress responding rates and, at higher doses, induce weight loss in a dose- and time-related fashion. Peak withdrawal was observed 1/2 hr after Nx and no significant depression of responding was detectable at 3 hr after injection. Complete tolerance to the behavioral depressant effects of the M pellet was apparent by day 2 and maximal dependence was observed between days 2 and 11 after implant. Significant depression of FR behavior was observed when no change in weight could be detected indicating that operant techniques may be more sensitive in detecting and quantifying Nx precipitated withdrawal.

GERLACH, J., KOPPELHUS, P., HELWEG, E. and MONRAD, A. Clozapine and haloperidol in a single blind cross-over trial. Treatment of schizophrenia, therapeutic and biochemical aspects. Acta Psychiatria Scandinavica (in press)

GESSNER, P.K. Induction of a diethyl ether withdrawal syndrome in mice by exposure to ether vapor. The Pharmacologist 16: 304 (1974)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

GEYER, M.A. and SEGAL, D.S. Differential effects of reserpine and alpha-methyl-P-tyrosine on norepinephrine and dopamine induced behavioral activity. Psychopharmacologia 29: 131-140 (1973)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

GEYER, M.A. and SEGAL, D.S. Shock-induced aggression: Opposite effects of intraventricularly infused dopamine and norepinephrine. Behavioral Biology 10: 99-104 (1974)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

GIANUTSOS, G., HYNES, M.D., PURI, S.K., DRAWBAUGH, R.B. and LAL, H. Effect of apomorphine and nigrostriatal lesions on aggression and striatal dopamine turnover during morphine withdrawal: Evidence for dopaminergic supersensitivity in protracted abstinence. Psychopharmacologia 34: 37-44 (1974)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

GLICK, S.D. Change in sensitivity to morphine-induced analgesia after caudate nucleus lesions in mice. Research Communications in Chemical Pathology and Pharmacology 7(4): 775-778 (April, 1974)

When electrical foot shock is administered to mice, morphine increases both the latency to vocalize (squeak) and the latency to escape from the shock. Bilateral lesions of the caudate nuclei produced a persistent potentiation of the effect of morphine on escape latencies without influencing morphine's effect on vocalization latencies. The caudate nuclei may be important in mediating the altered reaction to pain induced by morphine.

GLICK, S.D. Impaired tolerance to the effects of oral amphetamine intake in rats with frontal cortex ablations. Psychopharmacologia 28: 363-371 (1973)

When offered a solution of d-amphetamine sulphate (0.025 mg/ml) in place of water, normal rats initially drank more drug solution per day than previously consumed water. The drug solution quickly became aversive to normal rats as daily intake decreased. Tolerance to the anorexic effect of d-amphetamine paralleled the decrease in daily drug intake. Rats with bilateral lesions of frontal cortex initially consumed as much drug solution and as much food as normal rats. Although frontal rats' daily intake of drug solution also decreased, an aversion never developed. Tolerance to d-amphetamine's anorexic effect took much longer to occur in frontal rats. The results indicated possible roles for both cumulative drug effects and conditioning factors in the response to chronic d-amphetamine use. A possible mechanism by which frontal cortical lesions interfered with chronic changes was suggested.

GLICK, S.D. and CHARAP, A.D. Morphine dependence in rats with medial forebrain bundle lesions. Psychopharmacologia 30: 343-348 (1973)

Rats with posterior medial forebrain bundle (PMFB) lesions and control rats were administered morphine chronically for 4 or 5 days via implanted subcutaneous silicone reservoirs. Following cessation of morphine administration after five days, PMFB rats showed less withdrawal-induced weight loss than control rats. Other PMFB and control rats were subjected to forced drinking of morphine solution for 9 days. PMFB rats consumed the morphine solution much more readily than control rats, whereas intake of a quinine solution was similar in two other PMFB and control groups. These results suggest that the addictive and dependence properties of morphine may have separate mechanisms and based on previously reported neurochemical effects of PMFB lesions, that biogenic amines may be differentially involved in such mechanisms.

GLICK, S.D., GOLDFARB, T.L., ROBUSTELLI, F., GELLER, A. and JARVIK, M.E. Impairment of delayed matching in monkeys by chlorpromazine and pentobarbital. Psychopharmacologia 15: 125-133 (1969)

Monkeys trained to perform in a delayed matching test under five delay conditions were given chlorpromazine hydrochloride (0.05, 0.1, 0.2 and 0.4 mg/kg) and pentobarbital sodium (1.0, 10.0 and 20.0 mg/kg) before test sessions. Both drugs decreased response rate proportionally as dose increased. Chlorpromazine initially depressed accuracy, but showed no specific effects as delay interval increased. Pentobarbital had little effect upon accurcy, although impairment on the simultaneous conditions was seen at the highest dose. It is concluded that neither drug produced specific effects upon short-term memory.

GLICK, S.D. and JARVIK, M.E. Amphetamine, scopolamine and chlorpromazine interactions on delayed matching performance in monkeys. Psychopharmacologia 16: 147-155 (1969)

Two drug combinations, amphetamine-chlorpromazine and amphetamine-scopolamine, were examined in monkeys performing on a delayed matching test. Antagonism between the effects of amphetamine and chlorpromazine on both response rate and accuracy measures of performance was found. Amphetamine and scopolamine had antagonistic effects on response rate but synergistic effects on accuracy.

GLICK, S.D. and JARVIK, M.E. Differential effects of amphetamine and scopolamine on matching performance of monkeys with lateral frontal lesions. Journal of Comparative and Physiological Psychology 73(2): 307-313 (1970)

D-amphetamine and scopolamine were administered to four monkeys with dorsolateral frontal lesions and four unoperated monkeys performing a delayed matching task. Although initially impaired following surgery, the performance of the frontal monkeys on the delayed matching test had recovered to preoperative levels by the time of drug administration. Both d-amphetamine and scopolamine impaired the delayed and nondelayed matching performance of the unoperated control monkeys. However, only scopolamine and not amphetamine impaired the matching performance of the frontal monkeys. The higher doses of both drugs initially decreased the tendencies of both the frontal and unoperated monkeys to respond to the test stimuli. It is proposed that frontal monkeys, unlike normal monkeys, learn to depend upon a nonadrenergic system to solve the matching task and therefore are resistant to certain actions of amphetamine.

GLICK, S.D. and JARVIK, M.E. Impairment by d-amphetamine of delayed matching performance in monkeys. The Journal of Pharmacology and Experimental Therapeutics 169(1): 1-6 (1969)

The effect of d-amphetamine administration upon performance of delayed matching for water reinforcement was studied in eight rhesus monkeys. Accuracy decreased with increasing dose. A dose of 0.1 mg/kg of d-amphetamine increased responding, whereas doses of 0.2 and 0.4 mg/kg decreased responding. Under nondrug conditions, increasing the duration of water deprivation prior to testing increased both accuracy and responding. When d-amphetamine and increased deprivation were combined, an interaction between the two variables was found. The results are discussed in terms of the behavioral mode of action of d-amphetamine.

GLICK, S.D., JARVIK, M.E. and NAKAMURA, R.K. Inhibition by drugs of smoking behaviour in monkeys. Nature 227: 969-971 (August, 1970)

GLICK, S.D., LEVIN, B. and JARVIK, M.E. Role of monkeys' spatial preferences in performance of a nonspatial task. Journal of Comparative and Physiological Psychology 73(1): 56-61 (1970)

The performance of monkeys on a nonspatial delayed matching task was analyzed in terms of spatial and color preferences and perseverations. Monkeys were found to utilize significant spatial but not color tendencies. The strength of spatial tendencies was determined to be an important error factor accounting for differences among monkeys in overall accuracy. Spatial tendencies, however, could not account for intrasubject differences in accuracy as a function of testing conditions. Administration of d-amphetamine, scopolamine, and chlorpromazine lowered accuracy. Only the effect of d-amphetamine, however, could be largely attributed to an influence on spatial tendencies. The elicitation of spatial tendencies was found to be somewhat related to the immediacy with which monkeys performed the matching response.

GLICK, S.D. and MARSANICO, R.G. Apomorphine-induced and pilocarpine-induced hypothermia in mice: Drug interactions and changes in drug sensitivity after caudate nucleus lesions. British Journal of Pharmacology 51: 353-357 (1974)

1. Apomorphine and pilocarpine each produced dose-dependent hypothermic effects in mice. However, the dose-response curve for pilocarpine was steeper than that for apomorphine.

2. Bilateral lesions of the caudate nucleus produced a permanent decrease in sensitivity to apomorphine but had no effect on sensitivity to pilocarpine.

3. Apomorphine and pilocarpine had synergistic effects; i.e. the hypothermic effect was greater following a combination of the drugs than following either drug alone.

4. The effect of apomorphine was antagonized by either haloperidol or scopolamine; only scopolamine antagonized the effect of pilocarpine.

5. These results suggest that a mechanism involving dopaminergic neurones in the caudate nucleus has a modulatory role in temperature regulation.

GLICK, S.D. and MARSANICO, R.G. Time-dependent changes in amphetamine self-administration following frontal cortex ablations in rats. Journal of Comparative and Physiological Psychology (in press)

Rats were trained to intravenously self-administer d-amphetamine (.01 mg/kg/reward infusion) during daily 1-hr. testing sessions. Following removal of frontal cortex, rates of d-amphetamine self-administration were higher at early (3-5 days) postoperative intervals but lower at later (2-4 wk.) postoperative intervals. These and other results indicated that, as a function of time after surgery, frontal rats are first hyposensitive and then become increasingly hypersensitive to the rewarding effect of d-amphetamine.

GLICK, S.D., MARSANICO, R.G., ZIMMERBERG, B. and CHARAP, A.D. Morphine dependence and self-stimulation: Attenuation of withdrawal-induced weight loss. Research Communications in Chemical Pathology and Pharmacology 5(3): 725-732 (May, 1973)

Rats were allowed to self-stimulate the medial forebrain bundle during chronic morphine administration and/or subsequent withdrawal. Morphine initially depressed rates of self-stimulation; tolerance occurred within 2-3 daily 30 minute sessions. Withdrawal produced by cessation of morphine enhanced rates of self-stimulation. Withdrawal precipitated by a high dose (0.6 mg/kg) of naloxone depressed rates of self-stimulation. When self-stimulation was allowed only during the period of chronic morphine administration, subsequent withdrawal-induced weight loss was ameliorated. Self-stimulation during withdrawal alone or during both periods of morphine administration and withdrawal had no effect on withdrawal-induced loss. These results suggest that morphine influences the activity of the medial forebrain bundle and that such activity in turn affects the degree of dependence to morphine.

GLICK, S.D. and RAPAPORT, G. Tolerance to the facilitatory effect of morphine on self-stimulation of the medial forebrain bundle in rats. Research Communications in Chemical Pathology and Pharmacology (in press)

Low (1.25-2.5 mg/kg) and high (10.0 mg/kg) doses of morphine sulfate increased and decreased, respectively, rates of self-stimulation. Tolerance occurred to both effects upon repeated drug administration on four consecutive days.

GLICK, S.D., ZIMMERBERG, B. and CHARAP, A.D. Effects of alpha-methyl-p-tyrosine on morphine dependence. Psychopharmacologia 32: 365-371 (1973)

The effects of alpha-methyl-p-tyrosine (aMpT) on the initial liability to consume oral morphine solution and on withdrawal following cessation of passive morphine administration were assessed. aMpT depressed consumption of oral morphine solution if aMpT was administered throughout a nine day period of morphine intake; when aMpT administration was stopped a day prior to presentation of morphine solution, subsequent intake of morphine was enhanced. Following cessation of passive morphine administration, aMpT was found to ameliorate withdrawal-induced weight loss; this effect occurred to a similar extent regardless of whether a MpT was administered only during the first withdrawal day, only on days of morphine administration or during both periods of morphine administration and withdrawal. These results implicate an important role of catecholamines in addiction and dependence to morphine.

GLUCK, J.P. and FERRARO, D.P. Effects of delta-9-THC on food and water intake of deprivation experienced rats. Journal of Behavioral Biology 11(3): 395-401 (July, 1974)

Two groups of sixteen rats were placed on either a 23-hr food or water deprivation regimen for 150 days. For twelve days following this period of adaptation, half of the rats in each group were pretreated with an oral dose of 1.0 milligram delta-9-tetrahydrocannabinol per kilogram of body weight which was administered immediately after the daily 1-hr access to food and water. During the twelve-day treatment phase, all the rats were administered the drug dose two hours prior to the daily access period. Finally, the rats were returned to nondrug recovery conditions for eight days. The amount of food and water consumed during the 1-hr access period was increased by delta-9-tetrahydrocannabinol throughout the treatment phase, regardless of the rats' deprivation or pretreatment drug conditions.

GLUCK, J.P., FERRARO, D.P. and MARRIOTT, R.G. Retardation of discrimination reversal by delta-9-tetrahydrocannabinol in monkeys. Pharmacology Biochemistry and Behavior 1: 605-608 (1973)

Adult monkeys acquired a simultaneous 2-choice color discrimination after which they were given a series of ten successive discrimination reversals. Half of the monkeys received all of this discrimination training under the influence of a synthetic delta-9-trans-tetrahydrocannabinol (delta-9-THC), the major psychoactive constituent of marihuana, while the other monkeys served as nondrug controls. The drug states for the two groups were interchanged during the eleventh reversal. Although acquisition of the initial discrimination did not differ between the drug and control groups, subsequent discrimination reversals were markedly retarded for the drug group. Performance of the drug group on the initial reversals was characterized by perseveration to the previously reinforced stimulus. Introduction of the drug to the control group during the final reversal also produced an impairment of discrimination reversal performance.

GOLDBERG, S.R. Comparable behavior maintained under fixed-ratio and second-order schedules of food presentation, cocaine injection or d-amphetamine injection in the squirrel monkey. The Journal of Pharmacology and Experimental Therapeutics 186(1): 18-30 (1973)

Under a fixed-ratio (FR) schedule, every 10th or every 30th key-press response of squirrel monkeys resulted in either presentation of food or intravenous injection of drug. With optimal doses of cocaine or d-amphetamine and with optimal amounts of food, mean response rate was over one per second. Decreasing the cocaine or d-amphetamine dose resulted in irregular responding at reduced rates. Discontinuing food presentation had the same effect. Increasing the cocaine or d-amphetamine dose resulted in a high response rate at the beginning of each session, followed by decreasing response rates as the session progressed; increasing the amount of food had the same effect. Monkeys were then studied under a second-order fixed-interval schedule of FR components. Each FR component completed during a fixed interval of time (five minutes) produced only a brief light. The first FR component completed after the five-minute interval ended produced a brief light and either cocaine injection or food presentation. Mean response rates of about one per second were maintained consistently as the dose of cocaine injected or the amount of food presented was systematically varied over a wide range. Thus, striking parallels between drug-maintained responding and food-maintained responding occurred over a wide range of parameter values under both FR and second-order schedules.

GOLDBERG, S.R. Control of behavior by stimuli associated with drug injections. Psychic Dependence, Bayer Symposium IV, 1972. Pp. 106-109.

GOLDBERG, S.R. Nalorphine: Conditioning of drug effects on operant performance. Stimulus Functions of Drugs. Edited by G. Heistad, T. Thompson and R. Pickens. New York: Appleton-Century-Crofts, 1970.

GOLDBERG, S.R., HOFFMEISTER, F. and SCHLICHTING, U.U. Morphine antagonists: Modification of behavioral effects by morphine dependence. Drug Addiction: Experimental Pharmacology, Vol. 1. Edited by J.M. Singh, L. Miller and H. Lal. Mount Kisco, New York: Futura Publishing Company, Inc., 1972. Pp. 31-48.

GOLDBERG, S.R. and SCHUSTER, C.R. Conditioned suppression by a stimulus associated with nalorphine in morphine-dependent rhesus monkeys. Journal of the Experimental Analysis of Behavior 10: 235 (1967)

Rhesus monkeys which were dependent on morphine were measured in a food lever response. Nalorphine, which is an antagonist to morphine was administered to the monkeys. This caused withdrawal symptoms, and the administration of nalorphine caused a suppression of the food lever response rate. Two control rhesus monkeys not dependent on morphine had nalorphine administered to them. There was no change in the food lever response rate after the nalorphine was injected into the control monkeys, and no withdrawal symptoms occurred.

GOLDBERG, S.R., WOODS, J.H. and SCHUSTER, C.R. Morphine: Conditioned increases in self-administration in rhesus monkeys. Science 166: 1306-1307 (1969)

Operant responding in three monkeys was maintained by intravenous presentations of morphine. Nalorphine produced reliable increases in morphine-reinforced responding. With successive daily nalorphine injections there was a decreased latency of self-administration responding for morphine, and substituted saline injections produced conditioned increases in morphine-reinforced responding.

GOLDBERG, S.R., WOODS, J.H. and SCHUSTER, C.R. Nalorphine-induced changes in morphine self-administration in rhesus monkeys. The Journal of Pharmacology and Experimental Therapeutics 176: 464-481 (1971)

Small doses of nalorphine (30-300 mu-g/kg) and naloxone (3-10 mu-g/kg) markedly increased the rate of i.v. morphine self-administration in morphine-dependent rhesus monkeys; larger doses tended to decrease morphine self-administration. Naloxone was about 10 times more potent than nalorphine in producing these changes. There was evidence of sequential effects, with one dose of nalorphine affecting the response to subsequent doses. After repeated injections of small nalorphine doses, interspersed saline injections increased self-administration rate in some monkeys. Nalorphine, in the range of doses that produced changes in morphine self-administration, had no effect on cocaine self-administration.

GOLDSTEIN, A. and SHEEHAN, P. Tolerance to opioid narcotics. I. Tolerance to the "running fit" caused by levorphanol in the mouse. The Journal of Pharmacology and Experimental Therapeutics 169(2): 175-184 (1969)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

GOODE, E. The Marijuana Smokers. New York: Basic Books, Inc., 1970.

GORDON, N.B. The functional status of the methadone maintained person. Discrimination and the Addict. Edited by L.R.S. Simmons and M.B. Gold. International Yearbooks of Drug Addiction and Society, Vol. I. Beverly Hills, California: Sage Publications, 1973.

The foregoing presentations of our findings of over seven years of study of methadone patients has led us to a number of general conclusions. First and foremost, we have not found any evidence that maintenance on methadone per se should be a barrier to any activity chosen by a patient, consistent with his abilities and interests. The only qualification to this conclusion might be a medical one, which would stipulate that an adequate period of time for stabilization on the medication is necessary. In this connection, it should be kept in mind that our psychomotor studies were for the most part accomplished with patients who had been stabilized for a year.

Secondly, it must be recognized that methadone therapy is designed to deal only with heroin addiction. Other behavioral factors, such as emotional problems, ancillary drug abuse of substances such as cocaine, amphetamines, barbiturates and alcohol, where they occur, are problems that are also faced by those who do not use heroin. A potential employer should use the same judgment about a methadone patient as he would apply to any other individual. It cannot be assumed that the status "methadone patient" per se implies anything more than that an individual has volunteered to change his life style, perhaps save his life, and attempt to become a useful citizen. There is no evidence that the ancillary problems faced by methadone patients occur with any greater frequency in that group than in any other group in the general urban population.

Finally, it must be recognized that the performance potential of methadone treated ex-addicts is essentially normal, and their social behavior is likely to be superior in that they are seeking to improve their lot. They deserve to be treated as citizens rather than as ex-junkies, for their record of accomplishment is an impressive one.

GORDON, N.B. Reaction-times of methadone treated ex-heroin addicts. Psychopharmacologia 16: 337-344 (1970)

The reaction-times (r.t.'s) of 18 male and 9 female out-patients under treatment with methadone for heroin addiction, were compared with those of control subjects who were either non-drug users or had recently been withdrawn from narcotic drugs. Three different r.t. tests were used: a simple visual, simple choice and a multiple discrimination, multiple choice r.t.

The median r.t.'s of subjects tolerant to average doses of 100 mg of methadone per day were either equal to or shorter than those of control subjects. Analysis of the data revealed that the source of r.t. differences may be ascribable to superior signal detection or possibly decision time (pre-motor components) rather than limb tranport time components of the total reaction-time.

GRAHAM, J.M., JR., SCHREIBER, R.A. and ZEMP, J.W. Effect of d-amphetamine sulfate on susceptibility to audiogenic seizures in DBA/2J mice. Behavioral Biology 10: 183-190 (1974)

D-Amphetamine sulfate in saline was injected intraperitoneally into DBA/2J mice in doses ranging from 0.25 to 16.0 mg/kg. Fifteen minutes after injection, 21- or 26-day-old DBA/2J mice were tested for susceptibility to audiogenic seizures. Maximal protection was found at 1.0-2.0 mg/kg at both ages. Fewer 21-day-old animals died after the maximally effective dose, and at 26 days of age, fewer animals manifested a wild running response than did saline controls.

D-Amphetamine sulfate (2.0 mg/kg) was then injected intraperitoneally, into DBA/2J mice at 21, 24, 27, 30, or 45 days of age. Fifteen minutes after injection, each mouse was tested for susceptibility to sound-induced seizures. DBA/2J mice receiving D-amphetamine sulfate manifested significantly fewer severe seizures than control mice at 21, 24, and 27 days. In particular, the incidence of tonic seizures and death was significantly reduced for each of the age groups. For the 27-day-old mice, the incidence of clonic seizures was also significantly reduced.

GRIFFITHS, R.R., WURSTER, R., FINDLEY, J. and BRADY, J.V. Reduction of heroin self-administration in baboon subjects by manipulation of behavioral and pharmacological conditions. Presented at the Annual Meeting of the American Psychological Association, Baltimore, Maryland, 1974.

GRISHAM, M.G. and FERRARO, D.P. Biphasic effects of delta-9-tetrahydrocannabinol on variable interval schedule performance in rats. Psychopharmacologia 27: 163-169 (1972)

Four rats were trained to barpress for water reinforcement under a variable interval 60 sec schedule. Nine acute administrations of (-) delta-9-trans-tetrahydrocannabinol, in amounts ranging from 0.25 to 16.0 mg/kg, produced dose-related effects on responding; overall response rate increased at lower doses, while higher doses produced ataxia and a complete suppression of responding. Increased response rates reflected changes both in response spacing and in the lengths of post-reinforcement pauses. It was concluded that marihuana has a biphasic effect on variable interval water-reinforced behavior in rats.

HARRIS, L.S., DEWEY, W.L., SPAULDING, T.C., LEVY, J.A. and PLAINTIDOSI, S. Recent studies on the development of tolerance and physical dependence in rodents. Presented at the American Chemical Society Meeting, Rochester, New York, October 15, 1973.

HARRIS, R.T. and BALSTER, R.L. Discriminative control by dl-amphetamine and saline of lever choice and response patterning. Psychonomic Science 10(3): 105-106 (1968)

Discriminative control of lever choice and response patterning by internal states was demonstrated in rats trained on a two lever mult FR DRL schedule of food reinforcement. Saline was administered on days when the FR component was programmed and amphetamine when DRL was in effect. On subsequent extinction sessions, the animals responded on the lever and at rates which were appropriate to the compound administered.

HARRIS, R.T., WATERS, W. and McLENDON, D. Evaluation of reinforcing capability of delta-9-tetrahydrocannabinol in rhesus monkeys. Psychopharmacologia 37: 23-29 (1974)

Harnessed rhesus monkeys, surgically prepared with indwelling jugular catheters, were given access by means of remotely controlled infusion pumps to unlimited quantities of delta-9-trans-tetrahydrocannabinol. Naive monkeys as well as monkeys which were automatically infused with THC for over 28 days did not self-administer THC. Monkeys which had a history of multiple drug self-administration also did not self-infuse THC.

HARTMANN, R.J. and GELLER, I. P-chlorophenylalanine effects on a conditioned emotional response in rats. Life Sciences 10: 927-933 (1971)

Hungry rats learned to press a lever for a liquid food reward on a 2-minute variable-interval schedule of reinforcement. Lever pressing was suppressed in the presence of a tone stimulus by pairing the tone with brief electric shocks. p-Chlorophenylalanine, the tryptophan hydroxylase inhibitor, produced an attenuation of the conditioned suppression. The effect was reversed in some animals by administration of 5-hydroxytryptophan.

HARVEY, J.A., editor. Behavioral Analysis of Drug Action. Glenview, Illinois: Scott, Foresman and Company, 1971.

HARVEY, J.A. Physiological and pharmacological analysis of behavior. Advances in Behavioral Biology. Edited by R. Whalen. New York: Plenum Press, 1974, Pp. 125-147.

HASSELAGER, E., ROLINSKI, Z. and RANDRUP, A. Specific antagonism by dopamine inhibitors of items of amphetamine induced aggressive behavior. Psychopharmacologia 24: 485-495 (1972)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

HILL, H.F. and HORITA, A. Inhibition of (+)-amphetamine hyperthermia by blockade of dopamine receptors in rabbits. Journal of Pharmacy and Pharmacology 23: 715 (1971)

HILL, H.F. and HORITA, A. A pimozide-sensitive effect of apomorphine on body temperature of the rabbit. Journal of Pharmacy and Pharmacology 24: 490 (1972)

HILL, S.Y., SCHWIN, R., GOODWIN, D.W. and POWELL, B.J. Marihuana and pain. The Journal of Pharmacology and Experimental Therapeutics 188(2): 415-418 (1974)

Twenty-six men participated in a study of pain and sensation thresholds and pain tolerance. Cutaneous electrical stimulation was applied to the subjects' fingers and thresholds were determined before and after smoking marihuana. It was found that marihuana affected thresholds by increasing sensitivity to both painful and nonpainful stimulation and reducing tolerance for pain.

HILL, S.Y., SCHWIN, R., POWELL, B. and GOODWIN, D.W. State-dependent effects of marihuana on human memory. Nature 243: 241-242 (May, 1973)

HINDMAN, R.D., MILLER, J.M., MEYER, R.E. and COCHIN, J. The effect of length of exposure to etonitazene upon drug seeking behavior. The Pharmacologist 13: 262 (1971)

In has recently been postulated by us that in mice an etonitazene (ETA)-induced shift from the normal nocturnal drinking pattern to increased daytime drinking may be a measure of drug seeking behavior and may indicate the development of dependence on the drug. In a related study exploring drug-seeking behavior as a function of the length of exposure of the drug, 4 groups of mice were given ET2 (15 mu-g/ml) for varying periods of time - 0, 5, 7, 9 weeks. The drug groups showed a marked increase in daytime drinking as compared to the control group; the degree of change correlating with exposure to ET2. At the end of the above periods of exposure to the drug, all groups except the controls showed marked cross-tolerance to morphine. When the mice were given naloxone to precipitate the abstinence syndrome, the majority of animals on ET2 for nine wks. were shown to be physically dependent, while the other drug-treated groups showed fewer dependent animals. As a final test of drug-seeking behavior, all 4 groups were exposed to a drug/water choice situation in which drug seeking correlated well with length of exposure to drug. Thus, both the shift in drinking patterns and drug seeking correlate with forced exposure to ET2.

HIRSCHHORN, I.D. and WINTER, J.C. Mescaline and lysergic acid diethylamide (LSD) as discriminative stimuli. Psychopharmacologia 22: 64-71 (1971)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

HITZEMANN, R.J., HO, I.K., CHO, T.M. and LOH, H.H. Narcotic tolerance and dependence and serotonin turnover. Science 178: 645-647 (1972)

HO, B.T., McISAAC, W.M., AN, R., TANSEY, L.W. and WALKER, K.E. Effect of amphetamine analogs on disruption of animal behavior and barbiturate sleeping time. Advances in Mental Science, Drug Dependence. Austin, Texas: University of Texas Press, 1969.

HO, I.K., LOH, H.H. and WAY, E.L. Influence of GABA on morphine analgesia, tolerance and physical dependence. Proceedings of the Western Pharmacological Society 16: 4-7 (1973)

HOCHMAN, J.S. and BRILL, N.Q. Chronic marijuana use and psychosocial adaptation. American Journal of Psychiatry 130(2): 132-140 (February, 1973)

The authors studied the life history and adaptation of marijuana users and nonusers in a randomly selected representative sample of ten percent of the UCLA undergraduate student body. Statistically significant differences were discovered in family and personal history; educational and work performance; legal history; marital and sexual adjustment; current adaptation; political, religious, and other values; and the use of other drugs. Chronic use of marijuana was not accompanied by significant deterioration in functioning or adaptation but was accompanied by increasing acculturation into a relativistic, gratification-oriented, stimulus-seeking value system.

HOFFMEISTER, F. and GOLDBERG, S.R. A comparison of chlorpromazine, imipramine, morphine and d-amphetamine self-administration in cocaine-dependent rhesus monkeys. The Journal of Pharmacology and Experimental Therapeutics 187(1): 8-14 (1973)

Rhesus monkeys were studied during daily three-hour sessions in which every 10th key press (response) produced an intravenous cocaine injection. Cocaine doses from 0.2 down to 0.05 mg/kg/injection maintained stable responding. When monkeys were maintained at the 0.05 mg/kg/injection cocaine dose, sessions were conducted during which responses produced either saline, d-amphetamine, imipramine, morphine or chlorpromazine injections (substitution sessions) rather than cocaine injections. Response rate over successive saline-substitution sessions gradually decreased. Stable responding at rates higher than saline-substitution responding, was well maintained during successive substitution sessions, by injections of 0.01 to 0.05 mg/kg of d-amphetamine and by injections of 0.025 to 0.5 mg/kg of morphine. Imipramine, at injection doses of 0.05 to 0.5 mg/kg, failed to maintain rates of responding different from those during saline substitution. Response rates during and after chlorpromazine substitution (0.05-0.5 mg/kg/injection) were markedly suppressed, indicating that chlorpromazine has aversive or punishing properties.

HOLLANDER, C., editor. Collection of Background Papers on Student Drug Involvement. Washington, D.C.: United States National Student Association, 1967.

HOLLISTER, A.S., BREESE, G.R. and COOPER, B.R. Comparison of tyrosine hydroxylase and dopamine-beta-hydroxylase inhibition with the effects of various 6-hydroxydopamine treatments on d-amphetamine induced motor activity. Psychopharmacologia 36: 1-16 (1974)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

HOLLISTER, L.E. Hunger and appetite after single doses of marihuana, alcohol, and dextroamphetamine. Clinical Pharmacology and Therapeutics 12(1): 44-49 (January-February, 1971)

Two separate experiments indicated that in most subjects, after oral administration of marihuana, total food intake, as well as reports of hunger and appetite, are increased. Drugs such as dextramphetamine and, to a lesser extent, alcohol, reduced food consumption and appetite. Stimulation of appetite by marihuana is by no means invariable, occurring in only slightly more than half the subjects. Similar variations between individuals were observed in the case of responses to dextroamphetamine and alcohol.

HOLLISTER, L.E., MacNICOL, M.F. and GILLESPIE, H.K. An hallucinogenic amphetamine analog (DOM) in man. Psychopharmacologia 14: 62-73 (1969)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

HOLTZMAN, S.G. Behavioral effects of profadol in the rat. Psychopharmacologia 34: 135-142 (1974)

The effects of profadol, an analgesic with mixed agonist and antagonist properties, were evaluated on continuous avoidance responding and locomotor activity in the rat. Profadol was tested alone and concomitantly with 8.0 mg/kg of naloxone. Profadol had a biphasic effect on avoidance response rate, increasing it at from 0.5-8.0 mg/kg and decreasing it at 32 mg/kg. Naloxone blocked both the rate increasing and the rate decreasing effects of profadol on avoidance responding. Locomotor activity was unaffected by 0.5-64 mg/kg of profadol alone, but was increased when profadol and naloxone were administered together. These findings extend the dual action hypothesis for morphine to a partial morphine agonist. This study provides further evidence that the behavioral activity of narcotic antagonists can be evaluated in the rat in an objective and quantitative manner.

HOLTZMAN, S.G. Behavioral effects of separate and combined administration of naloxone and d-amphetamine. The Journal of Pharmacology and Experimental Therapeutics 189(1): 51-60 (1974)

Dose-response curves for d-amphetamine were determined in the rat for three distinct types of behavior: continuous avoidance responding, locomotor activity and food intake. The effects of d-amphetamine were also evaluated on locomotor activity and food intake in the mouse. d-Amphetamine was tested alone and in combination with naloxone, a specific narcotic antagonist that is almost devoid of agonistic properties. Characteristic amphetamine effects were observed in both species. Avoidance responding and locomotor activity were increased by low doses of d-amphetamine and were disrupted by higher doses. A similar biphasic dose-response curve was generated for food intake in the rat, but d-amphetamine produced only a suppression of food intake in the mouse. Otherwise inactive doses of naloxone significantly and consistently reduced the stimulant effects of d-amphetamine on avoidance responding and locomotor activity in the rat; no consistent drug interactions occurred in the locomotor activity tests in the mouse. There were no interactions between naloxone and d-amphetamine on food intake in either species. However, in the rat, naloxone itself showed pronounced activity in suppressing food intake. The results show that a narcotic antagonist can markedly modify the behavioral effects of a non-opioid psychoactive drug. Furthermore, it appears that some of the actions of naloxone are species dependent.

HOLTZMAN, S.G. Interactions of pentazocine and naloxone on the monoamine content of discrete regions of the rat brain. Biochemical Pharmacology 23: 3029-3035 (1974)

Pentazocine, 5.6 to 56 mg/kg, caused dose-related decreases in the catecholamine content of discrete regions of the rat brain. Norepinephrine levels were lowered in all brain regions examined, whereas the depletion of dopamine was restricted to the cortex and striatum. Serotonin levels were relatively unaffected by pentazocine. Pretreatment with naloxone antagonized the pentazocine-induced depletion of brain dopamine. Naloxone also blocked the pentazocine-induced depletion of norepinephrine in the cortex and midbrain, but failed to affect the depletion of norepinephrine in the medulla and actually enhanced the depletion of hypothalamic norepinephrine. A significant depletion of medullary serotonin was observed only in rats pretreated with naloxone. These findings are consistent with the concept that pentazocine's agonistic spectrum of activity involves two components: one which is blocked by naloxone and one which is not.

HOLTZMAN, S.G. Narcotic antagonists as stimulants of behavior in the rat: Specific and nonspecific effects. Narcotic Antagonists. Edited by M.C. Braude, L.S. Harris, E.L. May, J.P. Smith and J.E. Villarreal. Advances in Biochemical Psychopharmacology, Vol. 8. New York: Raven Press, 1973.

The actions of cyclazocine, pentazocine, and levallorphan were evaluated on two distinct types of behavior in adult male rats: operant behavior (lever pressing maintained under a continuous avoidance schedule) and locomotor activity. Drug effects on the total brain content of norepinephrine and dopamine were also examined. Dose-response curves were first determined for each drug administered alone, and then redetermined with concomitant administration of 8 or 16 mg/kg of naloxone. The three narcotic-antagonist analgesics increased avoidance responding and locomotor activity in a graded manner over a broad range of doses. The order of potency and peak activity in both procedures was cyclazocine greater than levallorphan greater than pentazocine. These drugs also produced dose-related decreases in brain catecholamine content ranging from 13 to 40%. Thus, the rat is a unique species in that its response to narcotic antagonists is characterized by graded behavioral stimulation. Naloxone, itself inactive in all procedures, blocked the effects of the narcotic-antagonist analgesics on operant behavior, but not their effects on locomotor activity and brain catecholamine levels. These results indicate that the agonistic component of action of narcotic antagonists in the rat is mediated by at least two mechanisms: one which is blocked by naloxone (i.e., specific), and one which is not (i.e., nonspecific).

HOLTZMAN, S.G. Tolerance to the stimulant effects of morphine and pentazocine on avoidance responding in the rat. Psychopharmacologia 39: 23-37 (1974)

Dose-response curves were determined for the effects of morphine (0.3-10 mg/kg) and pentazocine (1.0-30 mg/kg) on continuous avoidance responding in the rat. Each dose of morphine was retested following 3 days of morphine administration. The pentazocine curve was redetermined after 3 days of treatment with either pentazocine or morphine. Upon initial testing, morphine and pentazocine both generated biphasic dose-response curves. Graded increases in response rate were produced by 0.3-3.0 mg/kg of morphine and by 1.0-10 mg/kg of pentazocine; behavior was disrupted by 10 mg/kg of morphine and by 30 mg/kg of pentazocine. The stimulant effects of the lower doses of morphine and pentazocine were markedly reduced by 3 days of drug treatment; the disruptive effect of the highest dose of each drug was similarly attenuated. These findings show that tolerance can develop to a stimulant component of action of morphine and pentazocine in the rat. The development of pentazocine cross-tolerance to morphine provides additional support for the view that a common mechanism mediates the effects of morphine and pentazocine on avoidance behavior.

HOLTZMAN, S.G. and JEWETT, R.E. Interactions of morphine and nalorphine with physostigmine on operant behavior in the rat. Psychopharmacologia 22: 384-395 (1971)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

HOLTZMAN, S.G. and JEWETT, R.E. Shock intensity as a determinant of the behavioral effects of morphine in the rat. Life Sciences 11 (Part I): 1085-1091 (September, 1972)

For abstract, see Section I. Methodology of Drug Research.

HOLTZMAN, S.G. and JEWETT, R.E. Some actions of pentazocine on behavior and brain monoamines in the rat. The Journal of Pharmacology and Experimental Therapeutics 181(2): 346 (1972)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

HOLTZMAN, S.G. and JEWETT, R.E. Stimulation of behavior in the rat by cyclazocine: Effects of naloxone. The Journal of Pharmacology and Experimental Therapeutics 187(2): 380 (1973)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

HOLTZMAN, S. and VILLARREAL, J. Effects of acute and chronic morphine administration on operant behavior in rhesus monkeys. The Pharmacologist 10: 204 (1968)

Food reinforced lever-pressing behavior was maintained on a VI-1' schedule with 10" limited holds. This behavior was the baseline for two types of schedules with components of aversive control. In one, a visual stimulus terminating with a tail shock was presented at regular intervals (conditioned suppression paradigm CSP). In the other, shocks every response emitted in the presence of a visual stimulus (punishment paradigm PP). Morphine produced a dose-related depression of responding in all components of the 2 schedules. Published effects of narcotic analgesics on the CSP are thus not confirmed. Diazepam, a non analgesic increased responding suppressed in the CSP. Morphine was given chronically at two dose levels (1 and 2 mg/kg q 6h) to monkeys on the PP schedule. Responding was at first depressed but returned to pre-drug levels. Morphine deprivation led to large decreases in all lever responding, which were related to maintenance dose. Responding returned to control levels when morphine administration was resumed. This procedure should be considered for evaluation of the physical dependence capacity of analgesics.

HOLTZMAN, S.G. and VILLARREAL, J.E. Operant behavior in the morphine-dependent rhesus monkey. The Journal of Pharmacology and Experimental Therapeutics 184: 528-541 (1973)

Monkeys were trained to press a level under variable-interval or fixed-ratio schedules of food presentation. In each session, nonpunishment periods in which only the schedule of food presentation was in effect alternated with punishment periods in which the schedule of food presentation was in effect and each response produced the delivery of a brief electric shock to the tail. Punishment periods were designated by a red stimulus light. Morphine, 0.5 to 4.0 mg/kg, depressed unpunished and punished behavior equally. Tolerance developed to this effect. Physical dependence was produced by chronic morphine treatment with s.c. injection every six hours at two dose levels: 4.0 and 8.0 mg/kg/day. Withdrawal from either level of morphine maintenance produced marked decreases in unpunished behavior. Under one-minute variable-interval and 120-response fixed-ratio schedules, the decreases in unpunished responding produced by withdrawal were very consistent within and between monkeys. Under fixed-ratio schedules of 15, 30 or 60 the effects of morphine withdrawal on behavior were highly variable. Punished responding emitted at high base-line rates also was decreased by morphine withdrawal. However, punished responding emitted at

Holtzman, S.G. and Villarreal, J.E. continued
low base-line rates was increased by withdrawal. Drugs producing physical dependence of the morphine type, but not other classes of drugs, restored both unpunished and punished behavior disrupted by morphine withdrawal.

HORITA, A. and HAMILTON, A.E. The effects of DL-alpha-methyltyrosine and L-dopa on the hyperthermic and behavioral actions of LSD in rabbits. Neuropharmacology 12: 471-476 (1973)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

HUNT, H.F. Unconditioned stimulus functions of drugs: Interpretations, I. Chapter 5. of Stimulus Properties of Drugs. New York: Appleton-Century-Crofts, 1971.

HURST, P.M. Judgment distortion by amphetamines: Some moderating influences. Psychopharmacology of the Normal Human. Edited by W.O. Evans and N.S. Kline. Springfield, Illinois: Charles C. Thomas Company, 1969.

HURST, P.M., RADLOW, R. and BAGLEY, S.K. The effects of d-amphetamine and chlordiazepoxide upon strength and estimated strength. Ergonomics 11(1): 47-52 (1968)

Four drug treatments were administered to each of 58 college student volunteers who served as their own controls in a Latin square design. The treatments were d-amphetamine sulphate (11-17 mg), chlordiazepoxide HC1 (25 mg), placebo, and no drug.

Grip strength was measured on a Stoelting hand dynamometer 3-3½ hours after ingestion. Prior to giving their maximum effort, subjects were required to estimate their strengths on the basis of perceived effort required to reach an assigned submaximum value, determined as a percentage of masked pre-test scores.

Objective strength was significantly higher under d-amphetamine than under any other treatment condition. The treatments did not differ significantly with respect to estimated strength or estimate bias. These results imply that the increase in objective strength was not mediated by suggestion.

HURST, P.M., RADLOW, R., CHUBB, N.C. and BAGLEY, S.K. Drug effects upon choice behavior in mixed motive games. Behavioral Science 14(6): 443-452 (November, 1969)

It was hypothesized that strategic choice behavior is sensitive to changes in utility or affectively toned expectancies resulting from ingestion of mood-active drugs. A series of symmetrical two-person, mixed motive games was constructed upon the four non-trivial archetypes defined by Rapoport (1967). To heighten conflict, these were played for substantial amounts of real money. D-amphetamine, amobarbital, and a mixture of the two were selected as treatments likely to produce significant affective changes, and hence by hypothesis to alter volitional outcome.

Both of the amphetamine conditions produced the expected changes in mood self-ratings. They also significantly influenced several dimensions of choice behavior, thus establishing that the latter are sensitive to mood-active agents. However, the directions of change in choice behavior were not predictable from the directions of mood change, and some could better have been oppositely predicted.

HURST, P.M., RADLOW, R., CHUBB, N.C. and BAGLEY, S.K. Effects of alcohol and d-amphetamine upon mood and volition. Psychological Reports 24: 975-987 (1969)

The purpose was to measure drug effects upon mood self-ratings and upon volitional outcomes presumably related to changes in mood. Alcohol, d-amphetamine and placebo were administered, separately and in combination, to 70 male volunteers who served as their own controls. Measures of volitional behavior included gambling for money, and verbal production on assigned topics. Mood self-ratings were interspersed. Alcohol increased the number of maximum bets but did not significantly increase average bet size or affect verbal production. D-amphetamine significantly increased verbal production but not risk-taking. There was no evidence of drug interaction in either of these measures of volitional behavior. However, there were interesting combinatorial effects upon the various mood dimensions, where the combination of alcohol and d-amphetamine produced additive, non-additive and supra-additive effects. As in some previous studies, drug effects on the mood self-ratings were found to be useful but uncertain predictors of plausibly relevant volitional behaviors.

HURST, P.M., RADLOW, R. and PERCHONOK, K. Some dimensions of affective response to drugs. Psychological Reports 24: 239-261 (1969)

This study is an attempt to dimensionalize the affective responses of normal humans to some common psychoactive drugs. To this end, the methods of factor analysis were applied to a drug X mood correlation matrix. This technique differs radically from previous applications of factor analysis to mood effects, in that the latter characteristically analyze a mood X subject matrix. Thus, instead of reflecting the organization of individual differences, the resulting factor structure represented a mood-dimension space in which drug effects were resolved as vectors. Amphetamines were found to produce strong effects along three mood dimensions, whose relative strengths depend upon dosage, latency, and a strong dosage X latency interaction. Susceptibility to independent manipulation by dosage-latency variations implies that the three dimensions constitute more than statistical abstractions and may represent isolable biochemical events.

HURST, P.M., RADLOW, R. and WEIDNER, M.F. Effects of d-amphetamine on task-alternation and utility of delayed reward. American Journal of Psychology 81: 391-397 (1968)

Ninety college-student volunteers served as their own controls to test selected behavioral dimensions of d-amphetamine at two dosage-levels. Two hypotheses advanced to explain the drug's apparent effect on industriousness were tested according to overt behavioral criteria. The first hypothesis was that an anti-inhibition mechanism is involved. From this hypothesis was derived the prediction that the drug would produce less frequent alternation between two different repetitive tasks than the placebo. This was confirmed at p less than .02 for the smaller dosage and at p less than .001 for the larger dosage. The second hypothesis was that d-amphetamine reduces the disutility of delay in reward and thus flattens the goal-gradient. This was tested by offering Ss various delayed-payment options concerning their remuneration for the experiment. It was predicted that the drug would increase the acceptance of lower-interest options. The second hypothesis was not confirmed, although measurement-precision was too low for a conclusive test.

HURST, P.M., RADLOW, R., WEIDNER, M.F. and ROSS, S. Drugs and placebos: Drug guessing by normal volunteers. Psychological Reports 33: 683-694 (1973)

A series of 4 related experiments are described, using male and female student volunteers. Each experiment involved 3 to 5 evening sessions, during which a number of drug treatments were rotated among Ss. After drug ingestion, a series of experimental tasks, differing among the experiments, were used. At the end of each session, S reported on how the drug received had affected him, and classified the drug as a "stimulant," "depressant," "tranquilizer," or as having "no effect." In one experiment only the first two categories were used. Differences in drugs received accounted for only a small part of the variance in assigned categories. Amphetamines at the dose levels used were better discriminated from placebo than were other drugs. Limited (but recent) prior experience in being an S in drug experiments may facilitate drug recognition, if the experimental situation provides cues to S in relationship to task demands. However, since the over-all accuracy of drug recognition was only slightly better than chance (for both experienced and naive Ss), little error should be expected to arise from application of the usual (inert) placebo controls.

HURST, P.M., WEIDNER, M.F. and RADLOW, R. The effects of amphetamines upon judgments and decisions. Psychopharmacologia 11: 397-404 (1967)

D-amphetamine sulfate, dl-amphetamine sulfate, and placebo were orally administered to 93 college student volunteers who served as their own controls in a Latin Square design. Dosages were adjusted to the two-thirds power of body weight with the proportionality constant set for 14 mg/70 kg with each drug. Effects were measured upon performances in a mathematical reasoning test, upon self-appraisals of these performances, and in a task which attached monetary payments to the accuracy of self-appraisals ("Decision Score"). The objectives of this research were (1) to reassess the biases in performance self-appraisals reported by SMITH and BEECHER (1964), and (2) to determine whether these biases represent mere verbal expansiveness or whether they are reflected by changes in decision behavior.

SMITH and BEECHER's effect upon self-appraisals was confirmed (at p less than .02). Decision Score also was affected (at p less than .01) in the predicted direction. Performance scores were not significantly affected.

HUTCHINGS, D.E. and GIBBON, J. Preliminary study of behavioral and teratogenic effects of two "stress" procedures administered during different periods of gestation in the rat. Psychological Reports 26: 239-246 (February, 1970)

This study investigated the teratogenicity of prenatal maternal stress in the rat as well as the emotional effects produced in the offspring. To determine whether the magnitude of these effects or the direction of emotional change in the offspring depends on differences in the severity of the maternal treatments or the period in gestation when they are administered, animals were either "handled" or exposed to shock-escape during the 2nd or 3rd week only of gestation. Both treatments were equally effective in lowering the emotionality of the offspring irrespective of the period in gestation when treatments were administered. No appreciable teratogenic effects were produced by either treatment.

IDANPAAN-HEIKKILA, J.E., FRITCHIE, G.E. and McISAAC, W.M. Pharmacological and behavioral studies of STP: Relationship to tissue distribution. Advances in Mental Science, Drug Dependence, Vol. 2. Austin, Texas: University of Texas Press, 1969, Pp. 24.

IGLAUER, C. and WOODS, J.H. Concurrent performances: Reinforcement by different doses of intravenous cocaine in rhesus monkeys. Journal of the Experimental Analysis of Behavior 22: 179-196 (July, 1974)

Different doses of intravenous cocaine reinforced the lever pressing of rhesus monkeys under two lever concurrent or concurrent chain schedules. Under the concurrent procedure, responding produced drug reinforcers arranged according to independent variable interval 1-min. schedules. Under the concurrent chain procedure, responding in the variable interval link led to one of two mutually exclusive equal-valued, fixed-ratio links; completion of the ratio produced a drug reinforcer. Under both procedures, responding on one lever produced a constant dose of 0.05 or 0.1 mg/kg injection, while on the other lever, dose was systematically varied within a range of 0.013 to 0.8 mg/kg/injection. Preference, indicated by relative response frequency on the variable-dose lever during the variable-interval link, was always for the larger of the doses. Relative response frequencies on the variable dose lever roughly matched relative drug intake (mg/kg of drug obtained on variable lever divided by mg/kg of drug obtained on both levers). For many dose comparisons, responding occurred and reinforcers were obtained almost exclusively on the preferred lever. Overall variable interval rates generally were lower than with other reinforcers and these low rates, under the experimental conditions, may have occasioned the exclusive preferences.

ISAAC, W. A study of the relationship between the visual system and the effects of d-amphetamine. Physiology and Behavior 6: 157-159 (1971)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

ISAAC, W. and TROELSTRUP, R. Opposite effect of illumination and d-amphetamine upon activity in the squirrel monkey (saimiri) and owl monkey (aotes). Psychopharmacologia 15: 260-264 (1969)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

IWAMOTO, E.T., HO. I.K. and WAY, E.L. Elevation of brain dopamine during naloxone-precipitated withdrawal in morphine-dependent mice and rats. Proceedings of the Western Pharmacological Society 16: 14-18 (1973)

JACQUET, Y. and LAJTHA, A. A concurrent hyper/hypo-reactive syndrome following morphine microinjection in the midbrain central gray. Journal of Pharmacology 5(Supplement 2): 46 (1974)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

JAFFE, J., DAHLBERG, C.C., LURIA, J., BRESKIN, S., CHOROSH, J. and LORICK, E. Speech rhythms in patient monologues: The influence of LSD-25 and dextro-amphetamine. Biological Psychiatry 4(3): 243-246 (1972)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

JAFFE, J., DAHLBERG, C.C., LURIA, J. and CHOROSH, J. Effects of LSD-25 and dextroamphetamine on speech rhythms in psychotherapy dialogues. Biological Psychiatry 6(1): 93-96 (1973)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

JANOWKSY, D.S., EL-YOUSEF, M.K., DAVIS, J.M. and SEKERKE, H.J. Cholinergic antagonism of methylphenidate-induced stereotyped behavior. Psychopharmacologia 27: 295-303 (1972)

Rats were pretreated with methylscopolamine. One group received neostigmine or physostigmine followed by methylphenidate. Physostigmine, but not neostigmine prevented the occurrence of stereotyped gnawing behavior. Another group received methylphenidate followed by physostigmine or neostigmine. Physostigmine abolished rat stereotyped gnawing behavior.

JARVIK, M.E. and DABROWSKA, J. Effects of drugs and brain lesions upon learning and memory in monkeys. Use of Nonhuman Primates in Drug Evaluation. Edited by H. Vagtborg. Austin, Texas: University of Texas Press, 1968.

JESPERSEN, S. and SCHEEL-KRÜGER, J. Evidence for a difference in mechanism of action between fenfluarmine and amphetamine induced anorexia. Journal of Pharmacy and Pharmacology 25: 49-54 (1973)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

JOHANSON, C.E. and SCHUSTER, C.R. A comparison of the reinforcing efficacy of cocaine and methylphenidate in rhesus monkeys. Committee on the Problems of Drug Dependence. Washington, D.C.: National Academy of Sciences, National Research Council, 1973. P. 500.

JOHNSON, S. and DOMINO, E.F. Some cardiovascular effects of marihuana smoking in normal volunteers. Clinical Pharmacology and Therapeutics 12: 762-768 (1971)

Marihuana smoking caused a significant increase in heart rate in 25 normal male volunteers. The degree of tachycardia was significantly related to the dose of delta-9-tetrahydrocannabinol (delta-9-THC). The marihuana smoked contained 0.5 and 2.9 percent delta-9-THC and was compared to extracted marihuana as a control in a single-blind experimental design. Dose of delta-9-THC was expressed as the total amount available in the number of cigarettes smoked under standard conditions. The tachycardia reached a maximum within 30 minutes and persisted longer than 90 minutes. Systolic and diastolic blood pressures were significantly elevated after total doses of marihuana containing more than 10 mg. of THC, but blood pressure was better correlated to heart rate than to dose. Changes in the electrocardiogram were minimal, but there were premature ventricular contractions in some subjects.

JONAS, W. and SCHEEL-KRÜGER, J. Amphetamine induced stereotyped behavior correlated with the accumulation of O-methylated dopamine. Archives internationales de Pharmacodynamie et de Therapie 177: 379-389 (1969)

For abstract, see Section II. Drug Chemistry and Metabolism.

JONAS, W. and SCHEEL-KRÜGER, J. Pharmacological studies on tetrabenazine induced excited behaviour of rats pretreated with amphetamine or nialamide. Archives internationales de Pharmacodynamie et de Therapie 206: 47-65 (1973)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

JONES, L.G. and HERD, J.A. Autoradiographic visualization of ^{85}Kr in the normal dog kidney. American Journal of Physiology 226(4): 886-892 (April, 1974)

Autoradiographs and microvascular injection specimens were prepared from anesthetized dogs with normal renal blood flow as measured using intra-arterial injections of ^{85}Kr. Approximately 82% of the ^{85}Kr entered the renal cortex, 15% entered the vasa recta and peritubular capillaries of the outer medulla, and 2% entered the inner medulla. In the cortex, ^{85}Kr disappeared rapidly, whereas in the medulla, countercurrent exchange occurred and ^{85}Kr was trapped in the inner medulla and the vasa recta of the outer medulla. Autoradiographs and microvascular injection specimens also demonstrated peritubular capillaries in the outer two-thirds of the outer medulla that originated directly from juxtamedullary efferent arterioles, whereas in the inner regions of the outer medulla, peritubular capillaries originated from vasa recta.

JONES, R. Significance and characteristics of drug dependence: Characteristics of drug dependence to cannabis. Chemical and Biological Aspects of Drug Dependence. Edited by S.J. Mule and H. Brill. Cleveland, Ohio: Chemical Rubber Company Press, Inc., 1972. Pp. 65-81.

KAPLAN, S.L., KRON, R.E., LITT, M. and FINNEGAN, L.P. Correlations between scores on the Brazelton Neonatal Assessment Scale, measures of newborn sucking behavior, and birthweight in infants born to narcotic addicted mothers. Proceedings of Gatlinburg Conference on Research and Theory of Aberrant Infant Development, Gatlinburg, Tennessee, March, 1974.

Twenty-three infants born passively addicted to narcotics were studied on an instrument to measure infant sucking and on the Brazelton Neonatal Assessment Scale. Brazelton irritability items distinguished between the experimentals and controls (p less than .001), but did not correlate with sucking measures. Brazelton alertness items did not distinguish between experimental and controls, but did correlate with sucking measures ($r = .567$). Brazelton motor items both correlated with sucking measures ($r = .449$) and distinguished between experimentals and controls (p less than .05). The birthweight of the infants also correlated well with Brazelton motor ($r = .640$) and alertness item ($r = .442$). Weight also correlated highly with sucking measures ($r = .674$). In a high risk non-addicted population there were no correlations between groups of Brazelton items and birthweight. A second control population of low birthweight infants demonstrated a lack of correlation between birthweight and sucking. Thus, we conclude that the above findings are unique to the passively addicted infant population and are a result of the neonatal narcotic withdrawal syndrome.

KAPLAN, S.L., KRON, R.E., PHOENIX, M. and FINNEGAN, L.P. Behavioral assessment of infants born to narcotic addicted mothers: Comparison between scores on the Brazelton Neonatal Assessment Scale and the Neonatal Abstinence Scoring System. Pediatric Research (in press)

KAPLAN, S.L., KRON, R.E., PHOENIX, M.D., LITT, M. and FINNEGAN, L.P. Correlations between scores on the Neonatal Assessment Scale and measures of newborn sucking behavior. Presented at the 8th International Congress for Child Psychiatry and Allied Professions, Philadelphia, Pennsylvania, July-August, 1974.

KAYAN, S., FERGUSON, R.K. and MITCHELL, C.L. An investigation of pharmacologic and behavioral tolerance to morphine in rats. The Journal of Pharmacology and Experimental Therapeutics 185(2): 300-306 (1973)

The effect of experience in the hot-plate procedure on the response to acute and chronic doses of morphine was examined. It was found that a diminution in response to morphine was brought about by the repeated exposure to the test procedure in the absence of drug (initial behavioral tolerance). In addition, there was a diminution in response brought about by an interaction between the exposure to the test procedure and the presence of the drug (chronic behavioral tolerance). Tolerance occurring as a result of the repeated administration of the drug alone also was observed (pharmacologic tolerance). The results also show that 1) the interval between the tests is an important factor in the development of both initial and chronic behavioral tolerance and 2) pharmacologic tolerance develops less rapidly than behavioral tolerance and is influenced both by the frequency of administration and by the magnitude of the dose.

KAYAN, S. and MITCHELL, C.L. The effects of chronic morphine administration on tooth pulp thresholds in dogs and cats. Proceedings of the Society of Experimental Biology and Medicine 128: 755-760 (1968)

The effects of acute and chronically administered morphine on the threshold voltage required to elicit a response to tooth pulp stimulation in the dog and cat were quantitatively compared. A single dose of morphine elevated tooth pulp thresholds to a greater extent in dogs than in cats. After chronic administration, a decrease in the threshold occurred in cats but not in dogs. In the latter, a tolerance to (but not a reversal) of the threshold elevating effect was observed. Tolerance was seen to the overt depressant effects of morphine in dogs but not to the overt excitatory effects in cats. Studies concerned with attempts to delineate the reason(s) for these differences may be useful in advancing our knowledge concerning the mechanisms responsible for the analgesic effect of morphine and the development of tolerance to this drug.

KAYAN, S. and MITCHELL, C.L. Further studies on the development of tolerance to the analgesic effect of morphine. Archives internationales de Pharmacodynamie et de Therapie 182: 287-294 (1969)

The effect of frequency of drug administration, as well as the effect of experience in the test procedure on the development of tolerance to the analgesic effect of morphine was studied in rats using the hot plate method. Two frequencies of drug administration were used: weekly vs. daily. In both cases the rats were randomly divided into 4 groups: tested morphine group; non-tested morphine group; tested saline plus morphine group and non-tested saline plus morphine group. Morphine (10 mg/kg) or saline (2 ml/kg) was administered subcutaneously. When drug administrations were made weekly, tolerance was present only in the tested morphine group, not in the non-tested morphine group. In contrast, there was tolerance development in both the tested and nontested morphine groups in the case of daily administration. However, the degree of tolerance developed was greater in the tested than in the non-tested morphine group. Also, tolerance developed more rapidly in the tested animals when morphine was given on a daily basis than when given on a weekly basis. These results suggest that a least 2 types of tolerance may develop to the analgesic effect of morphine. This possibility must be considered in any study dealing with tolerance to morphine.

KAYAN, S. and MITCHELL, C.L. The role of the dose-interval on the development of tolerance to morphine. Archives internationales de Pharmacodynamie et de Therapie 198: 238-241 (1972)

The effect of the dose-interval on the development of tolerance to the analgesic effect of morphine was studied in rats using the hot plate method. Dose-intervals employed were 1-week, 2-weeks and 3-weeks. Morphine (5 mg/kg) was administered subcutaneously. Tolerance (significant decrease from initial area under the time-response curve) developed by the 2nd dose in the 1-week and 2-week interval groups. In the 3-week interval group, however, tolerance did not develop before the 3rd dose. After the 3rd dose, there was no difference in the magnitude of tolerance developed in all 3 dose-interval groups.

KAYAN, S. and MITCHELL, C.L. Studies on tolerance development to morphine: Effect of the dose-interval on the development of single dose tolerance. Archives internationales de Pharmacodynamie et de Therapie 199: 407-414 (1972)

Tolerance development to the analgesic effect of a single morphine dose was examined in rats using the hot plate procedure. A second dose of morphine (5 mg/kg, s.c.) was given 1 day, 1 week, 4 weeks, 8 weeks and 6 months after the first dose (either 10 mg/kg or 5 mg/kg, s.c.). When the initial dose of morphine was employed, either the animals were tested when they were under the influence of the drug (experienced), or they were not tested at all (naive). No tolerance development was observed in the naive animals at any time intervals studied. There was, however, a significant degree of tolerance development in the experienced animals at the 1 day, 1 week and 4 week interval if both drug doses were the same (5 mg/kg). If the first dose was 10 mg/kg and the second dose was 5 mg/kg, the tolerance was observed at 1 week and 4 weeks intervals only.

KAYAN, S., WOODS, L.A. and MITCHELL, C.L. Experience as a factor in the development of tolerance to the analgesic effect of morphine. European Journal of Pharmacology 6: 333-339 (1969)

The effect of experience in the test procedure on the development of tolerance to morphine was studied by dividing rats into 2 major groups; the tested group and the non-tested group (those which although receiving drug injections were not tested until the final day of the experiment). The hot plate procedure was used to measure analgesia. Morphine (5 mg/kg s.c.) or saline (2 ml/kg s.c.) was given once daily, once every 3 days, or once a week for varying periods of time. It was observed that (1) control reaction times decreased in the tested group and (2) the effect of chronically administered morphine was less in the tested group than in the non-tested group. It was concluded that experience in the test procedure can play a role in the development of tolerance to morphine. Thus, this possibility, and the consequences thereof, must be considered in studies dealing with the development of tolerance to morphine.

KAYAN, S., WOODS, L.A. and MITCHELL, C.L. Morphine-induced hyperalgesia in rats tested on the hot plate. The Journal of Pharmacology and Experimental Therapeutics 177(3): 509-513 (1971)

The ability of repeated morphine administration to produce hyperalgesia was studied in rats. The hot plate procedure was used to measure changes in the animal's response latency. The response latency was measured twice at 30-minute intervals, before the injection of the experimental agent and again at 30, 60, 90, 120, 180 and 240 minutes after drug administration. Morphine (5 mg/kg) or saline (2 ml/kg) was given s.c. for varying periods of time. It was found that chronic morphine administration produced hyperalgesia between 60 and 120 minutes after the drug. This hyperalgesia was found not to be the result of a morphine-test interaction. Acute administration of nalorphine, 5 mg/kg, delayed the onset of the hyperalgesic response produced by morphine. Studies designed to delineate the responsible mechanism(s) for this phenomenon may be useful in understanding the analgesic effect of morphine.

KELLEHER, R.T. and MORSE, W.H. Determinants of the behavioral effects of drugs. Importance of Fundamental Principles in Drug Evaluation. Edited by D.H. Tedeschi and R.E. Tedeschi. New York: Raven Press, 1969. Pp. 383-405.

KELLEHER, R.T. and MORSE, W.H. Determinants of the specificity of behavioral effects of drugs. Ergebnisse der Physiologie 60: 1-56 (1968)

KELLEHER, R.T., MORSE, W.H., GOLDBERG, S.R. and HERD, J.A. Behavioral modulation of the cardiovascular effects of l-norepinephrine in the squirrel monkey. The Journal of Pharmacology and Experimental Therapeutics 191(2): 269-283 (1974)

The effects of norepinephrine on mean arterial blood pressure and heart rate were studied under controlled behavioral conditions. Squirrel monkeys, prepared with chronic arterial and venous catheters, responded (pressed a key) under fixed-ratio schedules of termination of a stimulus associated with occasional electric shock or under fixed-ratio schedules of food presentation. When no behavioral schedule was in effect, norepinephrine produced dose-dependent increases in blood pressure and decreases in heart rate. Under the fixed-ratio schedules, periods of rapid responding alternated with periods of no responding, and episodic increases in both blood pressure and heart rate occurred in phase with responding. While norepinephrine was being infused under these conditions, blood pressure was high; heart rate was correspondingly low during periods of no responding, but increased markedly during periods of responding, often returning to levels prevailing before infusion. Phenylephrine produced similar effects, whereas angiotensin had much less tendency to decrease heart rate at doses which increased blood pressure. Neostigmine, which decreased the resting heart rate, enhanced the episodic increases in heart rate with little or no change in blood pressure. Under all of these conditions, methyl atropine markedly attenuated the behaviorally induced episodic changes in heart rate. The results indicate that withdrawal of the vagally mediated bradycardia induced by the baroreceptor reflex occurs during schedule-controlled responding. Further, they suggest that heart rate modulation in the squirrel monkey under conditions of these behavioral experiments is controlled primarily by changes in vagal activity.

KELLEHER, R.T., MORSE, W.H. and HERD, J.A. Effects of propranolol, phentolamine and methyl atropine on cardiovascular function in the squirrel monkey during behavioral experiments. The Journal of Pharmacology and Experimental Therapeutics 182(2): 204-217 (1972)

Systemic mean arterial blood pressure and heart rate were measured in squirrel monkeys trained under a fixed-ratio schedule to press a key that turned off a light associated with the delivery of electric shocks. The mean blood pressures were above values previously recorded in untrained squirrel monkeys. Episodic increases in blood pressure and heart rate commonly were associated with schedule-controlled key-pressing behavior. Phentolamine decreased blood pressure and increased heart rate. The episodic increases in blood pressure persisted even when phentolamine markedly lowered blood pressure. There was little change in blood pressure after propranolol, which markedly decreased heart rate, or after methyl atropine, which increased heart rate. After either drug, the episode increases in blood pressure persisted. None of these drugs consistently affected key-pressing behavior over the range of doses that markedly affected blood pressure or heart rate. Atropine, which had cardiovascular effects similar to methyl atropine, decreased rates of key pressing. Combinations of propranolol and methyl atropine had effects similar to propranolol alone; these findings suggest that in the squirrel monkey a relatively high degree of sympathetic nervous system tone persists during behavioral experiments.

KELLEHER, R.T., MORSE, W.H. and HERD, J.A. A pharmacological analysis of behaviorally-induced changes in cardiovascular function in the squirrel monkey. Behavior Control and Modification of Physiological Activity. Edited by D.I. Mostofsky (in press)

KERR, F.W. Morphine self-administration in dependent monkeys: Reduction by hypothalamic lesions. IRCS International Research Communications System (73-12) 7-16.

KHALSA, J.H. and DAVIS, W.M. Effects of chronic alpha-methyltyrosine on the locomotor activity response to morphine and amphetamine in rats. The Pharmacologist 15(2): 219 (1973)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

KHALSA, J. H. and DAVIS, W.M. Inhibition of motility response to morphine or d-amphetamine and of feeding behavior in rats by u-14, 624. Federation Proceedings 33: 564 (1974)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

KHAZAN, N. Declining levels of electrocorticogenesis and their response to morphine in the morphine dependent rat. Federation Proceedings 29(2): 781 (1970)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

KHAZAN, N. Longitudinal EEG study of the effects of morphine injections and withdrawal in the morphine dependent rat. Committee on the Problems of Drug Dependence. Washington, D.C.: National Academy of Sciences, National Research Council, 1970.

For abstract, see Section III. Mechanisms of Action of Different Drugs.

KHAZAN, N. and COLASANTI, B. Decline in the mean integrated electroencephalogram voltage during morphine abstinence in the rat. The Journal of Pharmacology and Experimental Therapeutics 177(3): 491 (1971)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

KHAZAN, N. and ROEHRS, T. Methadone dependence and abstinence: EEG study in the rat. Drug Addiction: Neurobiology and Influences on Behavior, Vol. III. Edited by J. M. Singh and H. Lal. New York: Stratton Intercontinental Medical Book Company, 1974.

For abstract, see Section III. Mechanisms of Actions of Different Drugs.

KIPLINGER, G. F. and MANNO, J. E. Dose-response relationships to cannabis in human subjects. Pharmacological Reviews 23(4): 339 (1971)

KJELLBERG, B. and RANDRUP, A. Changes in social behaviour in pairs of vervet monkeys (Cercopithecus) produced by single, low doses. Psychopharmacologia 26: 117 (Suppl. 1972)

Social behaviour such as mutual grooming, sexual intercourse, other forms of touching and vocalization was recorded in six pairs of monkeys (male + female). Changes in these items of behaviour, most often reductions, were seen after injection of d-amphetamine to both monkeys. Significant changes were found after 0.05 mg/kg s.c. with increasing effects of higher doses such as 0.15 and 0.37 mg/kg.

The experiments indicate that behavioural toxicity affecting social behaviour should be seriously considered in connection with clinical use as well as abuse of amphetamines.

KJELLBERG, B. and RANDRUP, A. Disruption of social behaviour of vervet monkeys (Cercopithecus) by low doses of amphetamines. Pharmakopsychiatric. Neuropharmakologie 6: 287-293 (1973)

Social behavior was recorded in 6 pairs of monkeys (male and female). Changes in these items of behavior, most often reductions, were seen after injection of d-amphetamine to both monkeys. Significant changes were seen after 0.05 mg/kg s.c. with increasing effects of higher doses.

The experiments indicate that possible effects on social behavior should be seriously considered in connection with clinical use as well as abuse of amphetamines. Further, the experiments indicate that there is a similarity between schizophrenia and amphetamine states in animals not only with respect to stereotype of behavior but also with respect to social behavior.

KJELLBERG, B. and RANDRUP, A. The effect of amphetamine and pimozide, a neuroleptic, on the social behaviour of vervet monkeys (Cercopithecus SP.). Advances in Neuro-Psychopharmacology. Edited by O. Vinar, Z. Votava and P. B. Bradley. Amsterdam, the Netherlands: North-Holland Publishing Company, 1971. Pp. 305-310.

This report is part of an investigation, which we started almost two years ago, in which we studied the effects of amphetamine on the behaviour of non-human primates. We think that the study of abnormal behaviour produced by amphetamine might be of interest in psychosis research as there might be a certain relationship between amphetamine psychosis observed in human addicts and certain forms of schizophrenia.

KJELLBERG, B. and RANDRUP, A. Excitatory behavioral effects of thymoleptics in monkeys (Cercopithecus SP). Dissertationes Pharmaceuticae et Pharmacologicae 23: 608 (1971)

KJELLBERG, B. and RANDRUP, A. Partial restoration by a neuroleptic (spiramide) of items of grooming behaviour suppressed by amphetamine. Archives internationales de Pharmacodynamie et de Therapie 210(1): 61-66 (July, 1974)

The neuroleptic drug spiramide restored grooming behaviour of rats suppressed by amphetamine. Since spiramide can be regarded as a specific blocker of dopamine, the experiments indicate that dopaminergic systems in the brain affect grooming behaviour. The restoration of grooming was not complete, grooming with the hind leg being particularly difficult to restore and more difficult the higher the amphetamine dose. Possible causes for the incompleteness of the restoration are discussed, and also possible relations of these findings with the incomplete normalization of psychotic patients treated with neuroleptic drugs.

KJELLBERG, B. and RANDRUP, A. Stereotypy with selective stimulation of certain items of behaviour observed in amphetamine treated monkeys (Cercopithecus). Pharmakopsychiatrie. Neuropharmakologie 5: 1-12 (1972)

The behavioral effects of a single dose of d-amphetamine were studied in experiments on 7 primate monkeys.

As in rats, amphetamine produced selective stimulation of certain behavioral items and decrease of others resulting in a behavior with stereotyped character. The behavioral items, which were stimulated, were different in the individual monkeys, and sometimes a monkey shifted from one behavioral item to another. For periods, simple movements of the mouth and protrusion of the tongue were observed. In contrast with rats abnormal behavior was also seen 24-176 hours after injection of amphetamine. Certain items of behavior were still selectively stimulated but were not now done continuously, grooming and other items of normal behavior were interspersed. Temporary reappearance of more stereotyped behavior was observed.

KJELLBERG, B. and RANDRUP, A. Various forms of stereotyped abnormal behaviour induced by amphetamine in non-human primates. Acta Physiologica Scandinavica 65 (Supplement 330) (1969)

There are to our knowledge relatively few reports dealing with the effects of amphetamine upon the behaviour of non-human primates. We have studied the behavioural effects of one single dose of d-amphetaminesulphate (4 mg/kg s.c.) upon 4 primate monkeys (Cercopithecus Cethiops).

As in rats we found selective stimulation of certain behavioural elements and suppression of others resulting in a behaviour with strongly stereotyped character. One monkey raised its right forepaw and looked at it continously for several hours. Another monkey made continous locomotion repeating a certain route covering only a part of the cage and two were sitting at the front wall of the cage seizing continously the bars of the wall while repeating certain movements of the limbs and the head. For periods, movements of the mouth and the tongue were also seen. Grooming was absent in all the monkeys during the period of stereotyped behaviour and then gradually returned. In contrast to rats, however, the behaviour was also abnormal the next day 24-32 hours after amphetamine. The monkey looking at its hand did this much more than normally but not continuously, grooming and other normal activities were interspersed. Another monkey performed on the second day new forms of abnormal behaviour, which were not been during the first day.

Kjellberg, B. and Randrup, A. Various forms...continued

It is concluded that when compared to e.g. rats, the behaviour displayed by these primate monkeys after one single dose of amphetamine is highly individual though rather constant for each individual.

KLEMM, W.R. A new, chronic experimental procedure for electrographic study of neuropharmacological mechanisms. Presented at Society for Neuroscience 4th. Annual Meeting. St. Louis, Missouri, October 20-24, 1974.

For abstract, see Section I. Methodology of Drug Research.

KNAPP, D.E. and DOMINO, E.F. The effect of brainstem transections on blood pressure in the dog. Life Sciences 8: 331-335 (1969)

Blood pressure was compared before and after midpontine pretrigeminal brainstem transection in the dog. Statistically significant decreases in blood pressure were observed 1/2, 1, and 1-1/2 hours after brainstem transection. It is suggested that portions of the central nervous system above the midpontine level are active in maintaining blood pressure at the level recorded before transection.

KNOWLER, W.C. and UKENA, T.E. The effects of chlorpromazine, pentobarbital, chlordiazepoxide and d-amphetamine on rates of licking in the rat. The Journal of Pharmacology and Experimental Therapeutics 184(2): 385-397 (1973)

Times between successive licks (interresponse times) were determined for rats licking water from a drinking tube. The distribution of interresponse times during bursts of rapid licking was highly peaked and was stable over long periods of time and under different degrees of water deprivation. Dose-effect relations were determined for chlorpromazine, pentobarbital, chlordiazepoxide and d-amphetamine on the mean and standard deviation of interresponse times and several other characteristics of the rats' drinking behavior. Both the mean and the standard deviation of interresponse times during bursts of rapid licking were increased by chlorpromzaine, pentobarbital and chlordiazepoxide. In contrast, d-amphetamine slightly decreased the mean interresponse time at low doses and increased it at higher doses. Chlorpromazine and d-amphetamine caused a decrease in total volume of water consumption. Chlordiazepoxide and low doses of pentobarbital increased water consumption, but higher doses of pentobarbital resulted in a decrease in volume consumed.

KOPELL, B.S. and WITTNER, W.K. The effects of chlorpromazine and methamphetamine on visual signal-from-noise detection. Journal of Nervous and Mental Disease 147(4): 418 (1968)

KRIMMER, E.C. and BARRY, H., III. Discriminability of pentobarbital and alcohol tested by two lever choice in shock escape. The Pharmacologist 15(2): 236 (1973)

Using escape from painful shock as the incentive for learning to choose the correct response, rats were trained in a standard 2 lever operant conditioning chamber. Eight rats from 3 groups were trained to discriminate 10 mg/kg pentobarbital (P) from saline (S), or 100 mg/kg alcohol (A) from saline, or P from A, all injected i.p., 10 ml/kg. With a learning criterion of 8 correct choices in 10 consecutive test days on the first trial of each day, the discrimination of P from S was learned more quickly than A from S or P from A. This study demonstrates, with the use of a lever pressing shock escape response, that at the doses used P had stronger stimulus properties than A and that the 2 drugs are discriminable from each other.

KRON, R. E., KAPLAN, S. L., FINNEGAN, L. P., LITT, M. and PHOENIX, M. D. The assessment of behavioral change in infants undergoing narcotic withdrawal: Comparative data from clinical and objective methods. International Journal of Addictive Diseases (in press)

The definitive medical management of the neonatal narcotic withdrawal syndrome has yet to be described. Standard clinical methods for evaluating the infant undergoing withdrawal tend to be insensitive to nuances in neonatal behavior that reflect important changes in CNS functioning. Finegrained clinical and objective methods of assessing the adaptive behavior of the infant, such as the Brazelton neonatal scales, the abstinence scoring system, and objective measures of sucking behavior, may help to better define the optimal pharmacologic treatment and dosage schedules for the abstinence syndrome.

KRON, R. E., LITT, M. and FINNEGAN, L. P. Behavior of infants born to narcotic addicted mothers. International Journal of Clinical Pharmacology and Therapeutic Toxicology 10(2): 144 (1974)

This report describes abnormalities in the nutritive sucking performance of congenitally addicted infants undergoing narcotic withdrawal.

A series of 50 infants born to mothers addicted either to heroin or to methadone were studied by an objective method for sucking behavior. Sucking rates as well as average pressures and amounts of nutrients consumed during sucking were significantly reduced for the addicted infants relative to a control group born to normal mothers and a second group born to toximic mothers. The subgroup of infants born to methadone-addicted mothers was significantly more depressed with regard to sucking behavior than the infants of heroin-addicted mothers. Furthermore, infants treated with paregoric (an opiate) for symptoms of narcotic withdrawal syndrome showed significantly less depression of the sucking response than those treated with sedatives such as pentobarbital. These results raise questions about a number of à priori assumptions regarding the safety and efficacy of current treatment methods for maternal and neonatal addiction.

KRON, R. E., LITT, M. and FINNEGAN, L. P. Effect of maternal narcotic addiction on sucking behavior of neonates. Pediatric Research 8: 364 (1974)

Measures of newborn sucking behavior were used to study effects on the infant's state of CNS arousal induced by maternal addiction. The sucking performance of 38 infants diagnosed and treated for narcotic withdrawal by a new symptom scoring system (Neonatal Abstinence Score) was compared with that of 50 infants whose withdrawal was regulated by acceptable clinical methods. The findings indicate the value of the scoring system in prescribing the dosage of drug therapy which resulted in better levels of CNS arousal and improved sucking performance. Also, using sucking performance as a criterion, it was found that paregoric was superior to phenobarbital in treating neonatal withdrawal. In addition, the severity of withdrawal as measured by sucking was directly related to the mother's length of time in the methadone maintenance program and her average dose of methadone. This finding may reflect the fact that patients enrolled in a maintenance program are assured of a continued supply of a long-acting narcotic drug, as compared to street addicts, whose supply is highly variable in quality and availability, and, that addicts who enter the methadone program during pregnancy tend to be given smaller doses than those who are not pregnant.

KUBENA, R. K. and BARRY, H., III. Stimulus characteristics of marihuana components. Nature 235: 397-398 (February, 1972)

The discriminative cues of delta-1-tetrahydrocannabinol (delta-1-THC), the major psychoactive constituent of marihuana, were studied in 12 male albino wistar rats, trained to respond in an approach or avoidance situation in which injections of delta-1-THC and a control fluid prior to the testing situation provided the cues to correct responding. Half of the animals were trained to approach in the drugged condition and avoid in the nondrugged condition, while the other half were trained to respond in the opposite manner. Following preliminary training, the animals responded correctly over 90% of the time. When the animals were tested using other compounds containing delta-1-THC (delta-1-THC synthesized by another laboratory, marihuana extract distillate, and alcoholic marihuana extract), the animals performed more reliably with the compounds containing greater amounts of delta-1-THC. A generalized metabolic inhibitor, SKF 525-A elicited a no drug response which injected alone, while it elicited a reliable drug response when followed by an injection of delta-1-THC. This finding suggests that the active compound is delta-1-THC itself and not a metabolite. When tests were conducted with tranquilizers, CNS depressants, psychotomimetics, other cannabinoids, morphine, and cocaine, it was found that they all seemed to have subjectively different effects from that of delta-1-THC.

LAL, H., O'BRIEN, J. and PURI, S.K. Morphine-withdrawal aggression: Sensitization by amphetamines. Psychopharmacologia 22: 217-223 (1971)

Aggressive behaviors during the withdrawal from morphine sulfate (400 mg/kg/day), were potentiated by methylphenidate or d and l isomers of amphetamine. d-Amphetamine was most active, while hydroxyamphetamine was without any effect. Optimum effect of the drugs depended upon the drug dose and the time of morphine withdrawal.

LAL, H. and PURI, S.K. Morphine-withdrawal aggression: Role of dopaminergic stimulation. Drug Addiction: Experimental Pharmacology, Vol. 1. Edited by J.M. Singh, L.H. Miller and H. Lal. Mount Kisco, New York: Futura Publishing Company, Inc. 1972.

For abstract, see Section III. Mechanisms of Action of Different Drugs.

LATIES, V.G. Actions of drugs and subjects. Review of T. Thompson and C.R. Schuster's Behavioral Pharmacology. Science 163: 558 (1969)

LATIES, V.G. Effects of d-amphetamine on concurrent schedules of heat and food reinforcement. Journal de Physiologie 63(3): 315-318 (1971)

LATIES, V.G. On the use of reference substances in behavioral toxicology. Adverse Effects of Environmental Chemicals and Psychotropic Drugs: Quantitative Interpretation of Functional Tests. Edited by E. Frantik. Proceedings of the I.A.O.H. Study Groups on Functional Toxicity, Vol 1. New York: Elsevier, 1973. Pp. 83-88.

LATIES, V.G. and WEISS, B. Behavioral mechanisms of drug action. Drugs and the Brain. Edited by P. Black. Baltimore, Maryland: The Johns Hopkins Press, 1969.

Our brief survey suggests that many questions about how drugs affect behavior must be put in terms of how the drugs interact with some of the variables that themselves control the behavior. Several of these variables have been studied: the experimental history, the schedule of reinforcement, the particular pattern and rate of responding, and the nature of the discriminative stimuli available to the organism. One broad generalization can safely be made: progress within psychopharmacology comes only after an adequate experimental analysis of behavior. Only after we understand the many factors that sustain and modulate behavior can we proceed to clarify the ways in which drugs modify that behavior.

LEANDER, J.D. and McMILLAN, D.E. Substantial oral morphine intake by the rat using schedule-induced polydipsia. Federation Proceedings 32: 726 (1973)

For abstract, see Section I. Methodology of Drug Research.

LEANDER, J.D., McMILLAN, D.E. and HARRIS, L.S. Effects of narcotic agonists and antagonists on schedule-induced water and morphine ingestion. The Journal of Pharmacology and Experimental Therapeutics (in press)

LEANDER, J.D., McMILLAN, D.E. and HARRIS, L.S. Schedule induced oral narcotic self-administration. Acute and chronic effects. The Journal of Pharmacology and Experimental Therapeutics (in press)

LEVINE, R., ZAKS, A., FINK, M. and FREEDMAN, A.M. Levomethadyl acetate: Prolonged duration of opioid effects, including cross-tolerance to heroin in man. Journal of the American Medical Association 226(3): 316 (October, 1973)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

LEWIS, E.G., DUSTMAN, R.E., PETERS, B.A. and BECK, E.C. Influence of delta-9-tetrahydrocannabinol on the human visual evoked response. Proceedings of the 80th Annual Convention of the American Psychological Association, 1972.

LEWIS, E.G., DUSTMAN, R.E., PETERS, B.A., STRAIGHT, R.C. and BECK, E.C. The effects of varying doses of delta-9-tetrahydrocannabinol on the human visual and somatosensory evoked response. Electroencephalography and Clinical Neurophysiology 35: 347-354 (1973)

The present study was designed to determine the effects of varying oral doses of delta-9-THC on the human visual and somatosensory evoked response.

Two groups of 10 subjects were studied. One group reported smoking marijuana at least twice a week (frequent user group) while subjects in the second group reported their marijuana use did not exceed twice per month (occasional user group). Delta-9-THC was extracted from raw marijuana plant material and administered orally on sugar cubes in doses of 0.2, 0.4 and 0.6 mg/kg. All subjects received each dose of delta-9-THC and a placebo in a randomized sequence. Recording sessions were separated by at least one week.

Lewis, E.G., Dustman, R.E., Peters, B.A., Straight, R.C. and Beck, E.C....continued

Data are reported for visual and somatosensory evoked responses recorded from frontal, central and occipital scalp 4 h after drug administration. For each response recorded under drug and placebo conditions amplitudes and latencies of consistenly identifiable wave components were calculated and analyzed.

No consistent evoked response differences were found between the frequent and occasional user groups. The most prominent finding was the consistency with which delta-9-THC slowed the latency of evoked response waves while producing relatively little change in amplitude. In contrast, most drugs have been found to exert their main effects on evoked response amplitude with only slight alterations of latency. It was thus hypothesized that delta-9-THC acts to increase the threshold of cortical and subcortical neurons or neural networks involved in producing the evoked response rather than to selectively inhibit brain-stem centers. Delta-9-THC administration produced no evidence of an excitatory action on the central nervous system. In those infrequent instances in which delta-9-THC did produce a change in evoked response amplitude it was always a decrease. Unlike alcohol, delta-9-THC did not alter amplitude hemispheric asymmetry.

LINTS, C.E. and HARVEY, J.A. Altered sensitivity to foot shock and decreased brain content of serotonin following brain lesions in the rat. Journal of Comparative and Physiological Psychology 67: 23-31 (1969)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

LLEWELLYN, M., IGLAUER, C. and WOODS, J.H. Cocaine dose preference in a choice procedure. The Pharmacologist 16: 215 (1974)

Under a two-lever concurrent schedule choice procedure, rhesus monkeys tend to respond exclusively on the lever associated with the higher of two intravenous cocaine doses. (Iglauer and Woods, J. Exp. Anal. Behav., 1974). The present study attempted to show a graded distribution of responding between the two levers associated with different doses of cocaine. The concurrent variable-interval 1-min procedure of Iglauer and Woods was modified so that the immediate availability of a reinforcer on one lever caused the other lever to become inactive until the reinforcer had been delivered. Three adult rhesus monkeys were used. The dose on one lever was held constant at 0.1 or 0.05 mg/kg/injection throughout the study. The dose on the other lever was selected from the range 0.013-0.8 mg/kg/injection and was held constant for several sessions until stability was observed. The greater proportion of total responding always occured on the lever associated with the greater of two doses of cocaine. In general the degree of this preference corresponded to the relative magnitude of the two doses.

LORENS, S.A. and MITCHELL, C.L. Influence of morphine on lateral hypothalamic self-stimulation in the rat. Psychopharmacologia 32: 271-277 (1973)

Morphine (5, 10, and 20 mg/kg, subcutaneously) both suppressed and elevated lateral hypothalamic self-stimulation response output. The duration of the depressant effect and the temporal appearance of the excitatory influence were dose dependent. With repeated daily injection tolerance developed to the suppressive effect while the facilitatory effect appeared earlier and tended to be enhanced. Thus the facilitatory action is not due simply to a rebounded phenomemon. Finally, no correlation between the effects of morphine on self-stimulation behavior and on wheel-running activity was observed.

LOWY, K., WEISS, B. and ABOOD, L. G. Influence of an anticholinergic psychotomimetic agent on behaviour in cats controlled by an auditory stimulus. Neuropharmacology 13: 707-718 (1974)

For abstract, see Section I. Methodology of Drug Research.

LYNCH, G.S., BALLANTINE, P., II and CAMPBELL, B.A. Potentiation of behavioral arousal after cortical damage and subsequent recovery. Experimental Neurology 23(2): 195-206 (February, 1969)

The effect of ablating the frontal cortex on the rat's activity-response to amphetamine was tested across a wide range of dosages and following varying postoperative intervals. Removal of the frontal poles (but not posterior cortical lesions) greatly potentiated the normal increases in spontaneous activity caused by amphetamine, and this effect became significantly reduced with longer post-operative intervals. Frontal lesions by themselves did not produce any changes in daily activity. The results are interpreted as supporting the hypothesis that the frontal cortex normally serves to control changes in behavioral arousal, and showing that recovery of this brain function takes place following cortical destruction.

LYON, M. The effect of no-shock or continuous shock upon avoidance behavior in rats under d-amphetamine. Activitas nervosa superior 13: 78-81 (1971)

That amphetamine initially increases the number of lever presses during unavoidable shock should not be surprising since it is depression of the lever which terminates ongoing shock on both schedules. The response changes under the drug are relevant to earlier training and show signs of extinction. During shock-free periods on the Av-R schedule the animals constantly engage in off-the-lever behaviour while this is punished on the Av-H schedule. The reaction of rats with amphetamine to no-shock is thus also consistent with the previous training on both schedules. Reversal tests also show that 2-3 mg/kg amphetamine sometimes "forces" the animal into irrelevant responding where consequences are increasing amounts of punishment (Teitelbaum and Derks 1958). Under amphetamine the animals appear to respond more or less continuously or not at all. Both features may represent perseveration in behaviour as a result of increasing behavioural stereotype which would explain why Av-R reversal and Av-H responding are more favourably affected at higher dose levels where stereotyped behaviours fit better with more effective forms of lever behaviour.

LYON, M. and RANDRUP, A. The dose-response effect of amphetamine upon avoidance behaviour in the rat seen as a function of increasing stereotypy. Psychopharmacologia 23: 334-347 (1972)

LYON, M. and SVENNILD, I. Counteraction of d-amphetamine induced operant (mult FI - FR) response changes by a neuroleptic (pimozide) in monkeys. Journal de Pharmacologie 5 (Supplement II): 62 (1974)

Five monkeys (cercopithecus) were trained on an alternating multiple FI 2' FR 48 schedule using a banana-orange juice reinforcement which was not affected by the anorexic effects of the drugs. D-amphetamine (0.3-0.5 mg/kg) and pimozide (0.01-0.06 mg/kg) were used singly and combined, in a partially counterbalanced order. Nearest preceding NaCl controls were matched comparisons. Response measures were: (1) Fixed Intervals: total responses/reinforcement and average latency of reinforced response; (2) Fixed Ratios: average time/reinforcement.

Lyon, M. and Svennild, I....continued

Results indicate: Amphetamine tends to produce maximal or no responding and longer pauses, when they occur. Pimozide already reduces total responding in a dose giving less than maximal amphetamine counteraction and counteracted amphetamine best on latency/reinforcement, respectively and time/reinforcement, respectively. The two drugs thus do not perfectly counteract each other behaviorally and full normalization with neuroleptics cannot generally be expected due to these factors.

LYONS, J., FERRARO, D.P., LYONS, J.E., SULLIVAN, J.G. and DOWNEY, D. Effects of delta-9-tetrahydrocannabinol on stimulus control. Bulletin of the Psychonomic Society 2(5A): 302-304 (1973)

Sixteen rats received extended discrimination training between two floor-tilt positions and then were given an extinction generalization test along the floor-tilt dimension. The stimulus control effects of four doses of delta-9-tetrahydrocannabinol (delta-9-THC), 0.0, 0.25, 0.50, or 2.0 mg/kg of body weight, were assessed in groups of four rats each. Delta-9-THC did not disrupt either discrimination performance or the occurrence of orderly generalization gradients. However, a significant dose-related enhancement of the postdiscrimination peak shift was obtained.

LYTLE, L.D., MOORCROFT, W.H. and CAMPBELL, B.A. Ontogeny of amphetamine anorexia and insulin hyperphagia in the rat. Journal of Comparative and Physiological Psychology 77(3): 388-393 (1971)

The effects of amphetamine and insulin on food intake were studied in neonatal and weanling rats. Amphetamine did not produce anorexia prior to 15 days of age and insulin did not produce hyperphagia until 25 days of age. Functional immaturity of the hypothalamus, a change in constituents monitored by the hypothalamus, or maturation of other structures may account for this developmental sequence.

McAULIFFE, W.E. and GORDON, R.A. A test of Lindesmith's theory of addiction. The frequency of euphoria among long-term addicts. American Journal of Sociology 79(4): 795-840 (January, 1974)

For abstract, see Section I. Methodology of Drug Research.

McCLUNG, R., DAFNY, N. and BURKS, T.F. Effects of morphine and naloxone on CNS field in unanesthetized rats. Federation Proceedings (in press)

For abstract, see Section I. Methodology of Drug Research.

McISAAC, W.M. Behavioral aspects of drug dependence. Advances in Mental Science, Drug Dependence. Austin, Texas: University of Texas Press, 1969. Pp. 143-214.

McISAAC, W.M., HARRIS, R.T. and HO, B.T. Behavioral correlates of brain distribution of tetrahydrocannabinol. Acta Pharmaceutica Suecica 8: 671-706 (1971)

McKEARNEY, J.W. The relative effects of d-amphetamine, imipramine and harmaline on tetrabenazine suppression of schedule-controlled behavior in the rat. The Journal of Pharmacology and Experimental Therapeutics 159(2): 429-440 (1968)

The benzoquinolizine derivatives, tetrabenazine (TBZ) and Ro 4-1284 suppress operant response rates. The effects of d-amphetamine, imipramine and harmaline in antagonizing this suppression were studied in the rat. d-Amphetamine and harmaline exerted a dose-dependent antagonism of the effects of TBZ in rats performing under either fixed-interval, variable-interval or fixed-ratio schedule of water presentation, or under a fixed-ratio schedule, of electric-shock termination. Previous investigators, using relatively gross indicators of behavior, have implied that imipramine and related drugs are antagonists of the behavioral effects of TBZ and other reserpine-like drugs. On the basis of the present results, this appears unwarranted. Over a wide range of dosage and time parameters, imipramine or desmethylimipramine did not antagonize the effects of TBZ, Ro 4-1284 or reserpine on schedule-controlled behavior. Imipramine did antagonize the effects of TBZ on fixed-interval response rate in the pigeon, but, in this species, imipramine itself markedly enhances response rates.

McKEARNEY, J.W. Responding under fixed-ratio and multiple fixed-interval fixed-ratio schedules of electric shock presentation. Journal of the Experimental Analysis of Behavior 14: 1-6 (July, 1970)

Squirrel monkeys, initially trained under a schedule of electric shock postponement and then under fixed interval schedules of electric shock presentation were studied under multiple fixed-interval fixed-ratio and under fixed-ratio schedules of shock presentation. Under the fixed-interval (10 min) component of the multiple schedule, a pause was followed by a gradual increase in responding to a rate maintained until shock presentation; under the fixed-ratio (3-, 10-, or 30-response) component of the multiple schedule, a brief pause was typically followed by a relatively high and uniform rate of responding until shock was presented. When the 60-sec timeout periods, which usually followed shock presentation, were eliminated from the multiple schedule for one monkey, responding was only transiently affected. In the one monkey studied, responding was maintained under a fixed-ratio schedule alone (with timeout periods), but rates of responding were lower than under the fixed-ratio component of the multiple schedule. Characteristic patterns of responding, similar to those engendered under schedules of food presentation or shock termination, can be maintained under fixed-ratio schedules of shock presentation; further, patterns of responding can be controlled by discriminative stimuli in multiple schedules.

McMAHON, T., FELDMAN, J. and SCHANBERG, S.M. Further studies of methamphetamine induced insulin release. Toxicology and Applied Pharmacology (in press)

McMILLAN, D.E. A comparison of the punishing effects of response-produced shock and response-produced time out. Journal of the Experimental Analysis of Behavior 10: 439-449 (September, 1967)

Electric shock and time out were compared as punishers in the squirrel monkey. At the parameters investigated, both suppressed responding to about the same degree. Scheduling punishment intermittently or administering pentobarbital reduced the effectiveness of both punishers. The effects of the punishers were different in that responding suppressed by shock recovered more within a session than responding suppressed by time out. Responding was suppressed after some shock punishment components, but less often after time out-punishment components. The similarities of the two punishers were more striking than the differences.

McMILLAN, D.E. Drugs and punished responding. I: Rate-dependent effects under multiple schedules. Journal of the Experimental Analysis of Behavior 19(1): 133-145 (January, 1973)

The effects of drugs were studied in pigeons whose responses were punished with electric shock during one component of a multiple fixed-interval 5 min fixed-interval 5-min schedule of food presentation. Most of the drugs analyzed for rate-dependent effects increased low rates of both punished and unpunished responding, while increasing higher rates less, or decreasing them; however, low rates of punished responding sometimes were increased more by pentobarbital, diazepam, and chlordiazepoxide than were matched rates of unpunished responding. In contrast, d-amphetamine and chlorpromazine usually increased low rates of unpunished responding more than matched rates of punished responding. These two drugs also decreased high rates of unpunished responding less than they decreased high rates of punished responding. Thus, the effects of drugs on punished responding depend on the control rate of punished responding; however, the rate-dependent effects of drugs on punished responding are not always the same as they are for unpunished responding.

McMILLAN, D.E. Drugs and punished responding. III: Punishment intensity as a determinant of drug effect. Psychopharmacologia 30: 61-74 (1973)

The effects of drug were studied on responding punished with various intensitites of electric shock. Morphine did not increase punished responding at any shock intensity. Chlorpromazine increased punished responding only when the dose was very large and only when the shock markedly suppressed responding. Pentobarbital and diazepam produced large increases in the rate of punished responding. These increases in punished responding depended on the shock intensity and on the control rate of responding.

McMILLAN, D.E. Drugs and punished responding. IV: Effects of propranolol, ethchlorvynol and chloral hydrate. Research Communications in Chemical Pathology and Pharmacology 6(1): 167-174 (July, 1973)

Pigeons were rewarded with grain for pecking a response key under a multiple schedule of food presentation. When key-peck responding was punished with electric shock, the rate of responding was decreased markedly. Ethychorvynol and chloral hydrate did not increase the rate of punished responding, but chlordiazepoxide produced large increases in the rate of punished responding. Propranolol, which has been reported to have sedativehypnotic activity, also did not increase the rate of punished responding. It appears that ethcholrvynol, chloral hydrate and propranolol do not increase punished responding, as do other drugs with sedative-hypnotic or minortranquilizing activity.

McMILLAN, D.E. The effects of sympathomimetic amines on schedule-controlled behavior in the pigeon. The Journal of Pharmacology and Experimental Therapeutics 160(2): 315-325 (1968)

Dose-response curves were determined for the effects of a series of sympathomimetic amines on the behavior of pigeons trained to peck a key under a multiple fixed-ratio fixed-interval schedule of food presentation. Mephentermine, d-amphetamine, hydroxyamphetamine and ephedrine all increased the rate of responding during the fixed-interval component of the schedule at low dosages. At higher dosages these drugs decreased the rate of responding during the fixed-ratio component of the schedule. Phenylephrine, metaraminol and norepinephrine had no effect on the rate of responding at low dosages and decreased the rate of responding during both components of the schedule at higher dosages. The effects of d-amphetamine and ephedrine on behavior were shown to be a function of the control rate of responding and the dosage.

McMILLAN, D.E. Physical dependence in rats after drinking narcotic analgesics. Federation Proceedings (in press)

For abstract, see Section I. Methodology of Drug Research.

McMILLAN, D.E. Some interactions between sympathomimetic amines and amine-depleting agents on the schedule-controlled behavior of the pigeon and the squirrel monkey. The Journal of Pharmacology and Experimental Therapeutics 163(1): 172-187 (1968)

Ephedrine and d-amphetamine increased the rate of key pecking by pigeons during the fixed-interval component of a multiple fixed-ratio, fixed-interval schedule of food presentation, but decreased the rate of key pecking during the fixed-ratio component. Tetrabenazine (TBZ) and phenylephrine decreased rates of responding during both schedule components. Ephedrine and d-amphetaime partially counteracted the rate-decreasing effects of TBZ during both schedule components, but phenylephrine only added to the rate-decreasing effects of TBZ. Analysis of the rates of responding during the fixed-ratio component and during local segments of the fixed-interval component suggested that the ability of ephedrine and d-amphetamine to partially reverse the effects of TBZ was related to the rate-increasing effect that these drugs have on low rates of responding, even when the low rates have resulted from injections of TBZ. The rate-decreasing effects of TBZ could also be reversed in the pigeon by caffeine, whereas d-amphetamine could also increase low rates after TBZ in the squirrel monkey and after NSD 1034 in the pigeon. Although certain dosages of both TBZ and NSD 1034 reduced the brain levels of norepinephrine in the pigeon, the dosages at which the brain levels of norepinephrine were lowered did not correlate well with the dosages at which behavioral changes occurred.

McMILLAN, D.E. and MILLER, A.T., JR. Interactions between carbon monoxide and d-amphetamine or pentobarbital on schedule-controlled behavior. Environmental Research 8(1): 53-63 (August, 1974)

Although carboxyhemoglobin values for the venous blood of pigeons exposed to carbon monoxide (CO) for 1.5 hours were similar to values obtained in other species exposed to the same CO concentrations, the schedule-controlled behavior (multiple fixed-ratio fixed-interval schedule) of the pigeons was relatively insensitive to the effect of CO. However, when the effects of d-amphetamine or pentobarbital on schedule-controlled behavior were studied in the presence of various concentrations of CO, interesting interactions were observed. CO blocked increases in the rate of key pecking produced by d-amphetamine or pentobarbital and enhanced decreases in the rate of responding produced by d-amphetamine, and to some extent by pentobarbital. CO enhanced the effects of pentobarbital on the temporal pattern of key pecking during the fixed-interval component of the schedule, but the effects of d-amphetamine on this temporal pattern were not enhanced by CO.

McMILLAN, D.E. and MORSE, W.H. Some effects of morphine and morphine antagonists on schedule-controlled behavior. The Journal of Pharmacology and Experimental Therapeutics 157(1): 175-184 (1967)

The effects of morphine, nalorphine and two benzomorphan narcotic antagonists were studied under a multiple fixed-ratio, fixed-interval schedule of food presentation. At appropriate doses all of the drugs increased rate of responding under the fixed-interval component. Higher doses decreased responding under both the fixed-interval and fixed-ratio components. The rank order of potency was the same for both the rate-increasing the rate-decreasing effects, with cyclazocine being the most potent, then morphine, pentazocine and nalorphine. The effects obtained after weekly injections of morphine could be replicated, suggesting that effects of tolerance were minimal. After daily administration of morphine, however, higher doses decreased responding less, but the same qualitative effects were still observed.

McMILLAN, D.E., WADDELL, F.B. and CATHCART, C.F. Establishment of physical dependence in mice by oral ingestion of morphine. The Journal of Pharmacology and Experimental Therapeutics 190(2): 416-419 (1974)

For abstract, see Section I. Methodology of Drug Research.

MABRY, P.D. and CAMPBELL, B.A. Ontogeny of serotonergic inhibition of behavioral arousal in the rat. Journal of Comparative and Physiological Psychology 86(2): 193-201 (1974)

Neonatal rats, ranging from 10 to 25 days of age, were injected with para-chlorophenylalanine, which depletes brain serotonin, and then tested for locomotor effects after periods of 0, 24, 48, and 72 hr. Depletion of serotonin increased behavioral arousal in 15-, 20-, and 25-day-old animals, but not in those that were 10 days of age. Para-chlorophenylalanine potentiated the locomotor activity induced by amphetaime, but again 10-day-old animals did not show the effect. Those results were interpreted as evidence for the delayed maturation of a serotonergic inhibitory system that modulates behavioral arousal.

MABRY, P.D. and CAMPBELL, B.A. Serotonergic inhibition of catecholamine-induced behavioral arousal. Brain Research 49: 381-391 (1973)

Amphetamine-induced locomotor activity in rats was potentiated by treatment with $_{p}$-CPA, a depletor of brain serotonin. At stronger doses, $_{p}$-CPA and amphetamine acted synergistically to produce activity levels that were greater than would be expected if the effects of the two drugs were simply additive. Administration of 5-HTP, the precursor of serotonin, prevented this effect. When rats treated with $_{p}$-CPA were given an acute injection of reserpine, there resulted a biphasic action. $_{p}$-CPA enhanced the heightened locomotor activity that immediately follows acute reserpine, but the subsequent level of sedation was not affected. These findings suggest that there is a serotonergic inhibitory system controlling catecholaminergic arousal.

MAICKEL, R.P., BRAUNSTEIN, M.C., McGLYNN, M., SNODGRASS, W.R. and WEBB, R.W. Behavioral, biochemical, and pharmacological effects of chronic dosage of phenothiazine tranquilizers in rats. The Phenothiazines and Structurally Related Drugs. Edited by I.S. Forrest, C.J. Carr and E. Usdin. New York: Raven Press, 1974.

For abstract, see Section I. Methodology of Drug Research.

MAICKEL, R.P., LEVINE, R.M. and QUIRCE, C.M. Differential effects of d- and l-amphetamine on spontaneous motor activity in mice. Research Communications in Chemical Pathology and Pharmacology 8(4): 711-714 (August, 1974)

For abstract, see Section I. Methodology of Drug Research.

MAICKEL, R.P. and MALONEY, G.J. Effects of barbital on deprivation-induced water consumption by rats. Physiology and Behavior 8: 1175-1178 (1972)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

MAICKEL, R.P., ROMPALO, A.M. and COX, R.H., JR. Differential effects of monoamine oxidase inhibitors. Research Communications in Chemical Pathology and Pharmacology 8(4): 727-730 (August, 1974)

For abstract, see Section I. Methodology of Drug Research.

MANHEIMER, D.I., MELLINGER, G.D. and BALTER, M.B. Psychotherapeutic drugs: Use among adults in California. California Medicine 109: 445-451 (December, 1968)

MANHEIMER, D.I., MELLINGER, G.D. and BALTER, M.B. Use of marijuana among an urban cross-section of adults. Communication and Drug Abuse. Edited by J.R. Wittenborn, J.P. Smith and S.A. Wittenborn. Springfield, Illinois: Charles C. Thomas, 1970. Pp. 225-243.

MANHEIMER, D.I., MELLINGER, G.D., SOMERS, R.H. and KLEMAN, M.T. Technical and ethical considerations in data collection. International Journal of the Addictions (in press)

MANNO, J.E., KIPLINGER, G.F., RODDA, B.E., FORNEY, R.B. and MANNO, B.R. Dose-dependent alterations in human motor and mental performance after smoking marijuana cigarettes. Chapter 1 of Drug Addiction: Clinical and Socio-Legal Aspects, Vol. II. Edited by J. Singh. Mount Kisco, New York: Futura Publishing Company, 1972. Pp. 3-11.

MANNO, J.E., MANNO, B.R. and KIPLINGER, G.F. Motor and mental performance with marihuana: Relationship to administered dose of THC and its interaction with alcohol. Behavioral Actions of Marihuana. Edited by L.L. Miller. New York: Academic Press (in press)

MARLEY, E. and MORSE, W.H. Effects of alpha-methyl derivatives of noradrenaline, phenethylamine and tryptamine on operant conditioning in chickens. British Journal of Pharmacology and Chemotherapy 31: 367-389 (1967)

MARR, M.J. Effects of chlorpromazine in the pigeon under a second-order schedule of food presentation. Journal of the Experimental Analysis of Behavior 13: 291-299 (May, 1970)

Chlorpromazine was studied for its effects on responding under a second order schedule in which food was presented following a sequence of 20 one minute fixed-interval components. A brief visual stimulus occured at the completion of each fixed interval including the one that terminated with food presentation. Chlorpromazine showed rate-dependent effects in that it increased low rates in the early components of the second-order schedule and, to a lesser extent, decreased high rates in the later components. Chlorpromazine also increased rates in the early quarters within the 1-min fixed-internal components and to a smaller extent decreased rates in the final quarter. The alteration in the patterns of responding within 1-min fixed-interval components terminating in a brief stimulus presentation was substantially less than that which occurred throughout the succession of 1-min fixed-interval components terminating in food presentation, thus suggesting that the presentation of the brief stimulus exerted more control over responding within components than did food presentation over the sequence of components. This result and others suggest that studies using drugs may be useful in elucidating the factors controlling patterns of responding in second-order schedules.

MARR, M.J. Second-order schedules. Conditioned Reinforcement. Edited by D. Hendry. Homewood, Illinois: Dorsey Press, 1969. Pp. 37-60.

MARTIN, B.R., DEWEY, W.L., HARRIS, L.S., and BECKNER, J. Marihuana-like activity of new synthetic tetrahydrocannabinols. Pharmacology, Biochemistry and Behavior (in press)

For abstract, see Section II. Drug Chemistry and Metabolism.

MARTIN, B.R., HARRIS, L.S. and DEWEY, W.L. Behavioral and pharmacological properties of 11-methyl-and 9-nor-delta-8-tetrahydrocannabinol. Federation Proceedings 33: 540 (1974)

For abstract, see Section II. Drug Chemistry and Metabolism.

MARTIN, B.R., HARRIS, L.S., DEWEY, W.L., MAY, E.L. and WILSON, R.S. Behavioral and pharmacological properties of 11-methyl- and 9-nor-delta-8-tetrahydrocannabinol. Federation Proceedings 33(3, Part I): 540 (March, 1974)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

MARTIN, J.C. and ELLINWOOD, E.H., JR. Conditioned aversion to a preferred solution following methamphetamine injections. Psychopharmacologia 29: 253-261 (1973)

Holtzman (Sprague-Dawley) rats which were injected in amounts ranging from 0.50-3.0 mg/kg i.p. of methamphetamine avoided a 0.1% saccharin solution which had been paired temporally with the injection, and drank water in a subsequent two-bottle choice situation under non-drug conditions. The aversion persisted for the duration of the experiment, which lasted and obtained whether the animals were fluid-deprived or fluid-satiated. Saline-injected controls, on the other hand, exhibited a 90% saccharin solution preference. Rats which received 0.25 mg/kg contiguous with the drug, or animals given 3.0 mg/kg paired with water, exhibited as extreme a preference for the saccharin solution as did the saline controls. It was concluded that neither a drugmediated taste quality change nor physiological cues associated with thirst were adequate explanations for the avoidance behavior exhibited, but that the drug was perceived as a noxious stimulus at levels above 0.50 mg/kg under the conditions described above.

MATSUOKA, S., DOMINO, E.F., TERADA, C., IKEDA, T., and COOPER, I.S. The sleep cycle of diskinetic patients before and after cryothalamotomy. Electroencephalography and Clinical Neurophysiology 23: 80-81 (1967)

MATSUZAKI, M. and OKAMOTO, M. Long-term alteration of sleep-wakefulness cycle during chronic pentobarbital dosing and withdrawal in cat. The Pharmacologist 16: 247 (1974)

The effects of chronic pentobarbital dosing on sleep-wakefulness cycle during the treatment and the drug abstinence were studied. Physical dependence was produced by repeated administration of maximally tolerable anesthetic doses of sodium pentobarbital, twice daily for 5 weeks through implanted intragastric tube (2nd Int'l. Symp. of Drug Addiction). EEG, neck EMG and eye movement were recorded continuously throughout the chronic treatment and the withdrawal. At the same time, neurologic and behavioral responses were noted daily at preset times. During the chronic treatment, states of physiological sleep (slow wave sleep (SWS) and paradoxical sleep (REM) were markedly suppressed. Following abrupt drug withdrawal, various withdrawal signs which include grand mal type seizures occurred within 20 to 24 hours and continued for 4 to 7 days. SWS and REM were completely absent while animals were displaying most severe withdrawal signs (2-4 days). SWS gradually appeared with the diminution of overt abstinence signs; 2-3 days later, REM emerged and continued to increase to rebound for 5-7 days. Complete recovery of the sleep-wakefulness cycle occurred in 3 weeks.

MELGES, F.T., TINKLENBERG, J.R., HOLLISTER, L.E. and GILLESPIE, H.K. Marihuana and temporal disintegration. Science 168: 1118-1120 (May, 1970)

High oral doses of marihuana extract, calibrated for content of I (-)-delta-1-tetrahydrocannabinol, significantly impaired the serial coordination of cognitive operations during a task that required sequential adjustments in reaching a goal. This disintegration of sequential thought is related to impaired immediate memory.

MELGES, F. T., TINKLENBERG, J. R., HOLLISTER, L. E. and GILLESPIE, H. K. Marihuana and the temporal span of awareness. Archives of General Psychiatry 24: 564-567 (June, 1971)

Oral doses of extracts of marihuana were found to induce a greater concentration on the present and a foreshortening of the span of awareness into the future. Although there were individual differences in emotional reactions, the greater concentration on the present was associated, in general, with euphoric moods.

MELLINGER, G.D. Psychotherapeutic drug use among adults: A model for young drug users? Journal of Drug Issues 1: 274-285 (1971)

MEYER, R.E., COCHIN, J., MILLER, J.M. and ROSOW, C. The relationship between aggression and host difference in vulnerability to opiate addiction in the white mouse. Committee on Problems of Drug Dependence. Washington, D.C.: National Academy of Sciences, National Research Council, 1970.

Our data suggest that a relationship exists between isolation induced aggression in the white mouse and opiate seeking behavior and between opiate avoidance and the absence of fighting behavior. Further, studies are underway to replicate these findings and to define more completely the nature of the opiate-seeking and avoiding behavior.

MICZEK, K.A. Does THC induce aggression? Suppression and induction of aggressive reactions by chronic and acute delta-9-tetrahydrocannabinol treatment in laboratory rats. Pharmacology of Cannabis. Edited by M. Braude and S. Szara. Baltimore, Maryland: University Park Press, 1975.

MICZEK, K.A. and BARRY, H., III. Delta-9-tetrahydrocannabinol and aggressive behavior in rats. Behavioral Biology 11: 261-267 (1974)

Fighting by pairs of albino rats, in a situation without painful shock, was measured by frequency or duration of dominant behaviors (biting attacks, threat postures, allogrooming, autogrooming), defensive-submissive behaviors (defensive-upright, submissive-supine and immobile-crouching postures), and mutual upright postures. Administration of delta-9-tetrahydrocannabinol (1, 2, or 4 mg/kg, intraperitoneally) to the subordinate rat impaired the defensive-submissive behaviors, while the non-drugged dominant rat's biting attacks became more frequent and injurious. Administration of the drug to the dominant rat greatly reduced attacks and threats toward the non-drugged subordinate rat, and the dominance was weakened but not reversed.

MICZEK, K.A. and BARRY, H., III. Effects of delta-9-tetrahydrocannabinol on aggressive behavior in laboratory rats. Drug Addiction: Neurobiology and Influences on Behavior, Vol. 3. Edited by J.M. Singh and H. Lal. New York: Stratton Intercontinental Medical Book Company, 1974.

According to various previous reports, delta-9-tetrahydrocannabinol (THC) increases or decreases aggressive behavior in laboratory animals. We have investigated this drug in a situation which reliably generates sequences of stereotypic fighting behavior in rats without preceding painful stimulation. Rats maintained at 85% of their free-feeding weight were trained to eat food pellets in a chamber. The frequency, duration and temporal pattern of ten postures and movements characteristic of offensive-dominant and defensive-submissive behavior were recorded for two rats in 15-minute tests in the same chamber without food. The normal dominant behavior includes biting attacks, attack and threat postures, self-grooming and social grooming, whereas the submissive animal normally displays defensive-upright, submissive-supine and immobile-crouching postures, urination, defecation and absence of grooming behavior, while being threatened and attacked, but usually without injuries.

The submissive animal was injected intraperitoneally, at 30 min before the start of the test, with THC (1, 2 or 4 mg/kg) or the control fluid (20% propylene glycol, 1% Tween 80 - isotonic saline, in a volume of 1 mg/kg). In the submissive animal, THC clearly increased the duration of immobile-crouching postures, while greatly decreasing the duration of defensive-upright and submissive-supine postures. The drugged, submissive animal also was groomed and was attacked more frequently and suffered more severe injuries. The drug effects were closely similar in 15 submissive animals which had no previous experience and 11 submissive animals which had extensive experience with the fighting situation. Therefore, THC impaired the defensive-submissive behavior pattern which effectively prevents or minimizes injury in normal intraspecies fighting. Contrary to some reports that THC increases aggressive behavior, a further experiment showed that administration of the drug to the dominant rat greatly decreased attack and threat behavior.

MICZEK, K.A., GIBBONS, J.L, and BARRY, H. III. Effects of delta-9-tetrahydrocannabinol and methysergide on defensive behavior in rats. Federation Proceedings 32(3): 725 (1973)

A stereotypic sequence of fighting behavior by pairs of male albino rats were generated without painful stimulation in 15 minute tests in which both rats, individually trained to approach and eat a food pellet on previous occasions, confronted each other without food available. The effects of delta-9-tetrahydrocannabinol (THC) (1, 2, 4 mg/kg) and methysergide (5, 10 mg/kg), I.P., 30 minutes before the test in different groups of rats, were measured on their defensive behavior in confrontations with experienced, dominant, nondrugged animals. Injuries were suffered under both drug treatments, but not in the control tests for the same animals. Immobile crouching also was increased by either drug. Upright defensive posturing was decreased by THC but increased by methysergide. Other components of the submissive - defensive behavior pattern (submissive supine posture, defecation, grooming) were not altered by either drug. Running speed to a food pellet was unaffected by THC but increased by methysergide. Although THC (a constituent of marihuana) and methysergide (a 5-hydroxytryptamine antogonist) act on different components of defensive behavior, both impair ability to avoid injury.

MIDDAUGH, L.D., BLACKWELL, L.A., SANTOS, C.A., III and ZEMP, J.W. Effects of d-amphetamine sulfate given to pregnant mice on activity and on catecholamines in the brains of offspring. Developmental Psychobiology 7(5): 429-438 (1974)

Offspring of C57BL/6J mice injected with d-amphetamine sulfate during the last third of pregnancy had slightly reduced body weight at birth, altered concentrations of catecholamines (CA's) in their brains during development, and increased activity after they had matured. Norepinephrine concentrations were depressed at birth, returned to control values by Day 3, and were elevated at 21 and 30 days after birth. Dopamine values were elevated at 30 days after birth. At 75 days of age, animals prenatally exposed to the drug had CA concentrations similar to controls, but had heightened activity levels compared to controls tested in the open field. The results of these experiments demonstrate that d-amphetamine sulfate administered to mice during the last third of pregnancy produce transient alterations in CA concentrations and long-lasting changes in behavior.

MIDDAUGH, L.D., SANTOS, C.A., III and ZEMP, J.W. Effects on phenobarbital given to pregnant mice on behavior of mature offspring. Developmental Psychobiology (in press)

Mature offspring of C57BL/6J mice (Mus musculus) injected daily with phenobarbital (40 mg/kg) for the last third of pregnancy differed from saline and untreated control animals on 3 measures of behavior. Offspring of phenobarbital treated animals had higher locomotor scores than controls during an open field activity test at 75 days of age. Male offspring were also tested on a 1-trial passive avoidance task and treated animals were found to be deficient. Finally, femals offspring responded less than controls on fixed ratio schedules of reinforcement. The behavioral changes suggest that offspring of mice injected with phenobarbital during pregnancy are less responsive to the stimuli in their environment which maintain behavior.

MILLER, J.M. and COCHIN, J. The effect of continued morphine (M) administration on motor activity in the mouse. The Pharmacologist 16: 248 (1974)

Because reports of tolerance to the effects of chronic M administration on motor activity in the mouse have been contradictory, the following experiment was performed. The M effect measured was change in activity as monitored in a photocell-activity chamber. Male CD-1 mice received 22 daily injections of M sulfate (2.5, 5.0, 10 or 20 mg/kg s.c.). The mice were placed in the activity chamber in groups of 5, 3 groups at each dose. A 5-min baseline count was obtained 30 min before the injection. Additional 5-min counts were made immediately following the injection and at 30 min intervals for 3 hours thereafter. The animals were tested after daily injections 1, 8, 15 and 22. Compared to saline controls, all M groups exhibited reduced motor activity in the test period just after injection on day 1. This early period of depressed activity was followed by stimulated activity which was dose related and reached a peak at 60 min. Activity counts after daily injections 8, 15 and 22 revealed the development of tolerance to the depressant effect, resulting in an apparent increase in sensitivity to the stimulant effect. In this experiment we have not seen any evidence of tolerance to the stimulation of activity that follows M administration.

MILLER, J.M. and COCHIN, J. Some aspects of tolerance to morphine in the mouse. Committee on Problems of Drug Dependence. Washington, D.C.: National Academy of Sciences, National Research Council, 1968. P. 5462.

We have demonstrated differences in the rate, degree, character and persistence of tolerance to the effect of chronic administration of 6 and 8 mg/kg doses of MS in mice as measured by the hot plate technique.

MILLER, J.M., MEYER, R.E., HINDMAN, R.D. and COCHIN, J. Etonitazene-induced shift of day/night drinking pattern in the white mouse. A measure of opiate-seeking behavior. The Pharmacologist 13: 262 (1971)

Knowing that the mouse normally consumes the major portion of its total fluid intake during the night, we hypothesized that an etonitazene (ETA)-induced shift toward a daytime drinking pattern may be indicative of drug seeking behavior. When ETA solutions (7 mcg/ml and 15 mcg/ml) were substituted for water, there was a concentration-related shift toward daytime drinking such that the two drug groups had daytime intakes of 12.5% and 17.5% respectively, compared to 7.5% by the control group. After 8 wks. both groups showed marked cross-tolerance to the analgesic effect of morphine sulfate (20 mg/kg) as measured by the hot-plate test. After 11 wks. both drug groups showed marked physical dependence as measured by a modification of the naloxone test. When presented with a drug/water choice the 15 mcg group preferred drug, while the 7.5 mcg and control groups showed no preference and water preference respectively. The altered day/night drinking pattern corresponds well with tolerance, naloxone-precipitated withdrawal and drug seeking behavior in a choice situation and seems to be a sensitive measure of opiate dependence in the mouse.

MILLER, L.L., editor. Marijuana. Effects on Human Behavior. New York: Academic Press, 1974.

For abstract, see Section I. Methodology of Drug Research.

MILLER, L.L. and DREW, W.G. Cannabis: Review of behavioral effects in animals. Psychological Bulletin 81(7): 401-417 (July, 1974)

Research studies concerning the action of cannabis and its derivatives on numerous aspects of animal behavior including spontaneous activity, escape and avoidance behavior, schedule-controlled behavior, state-dependent learning, miscellaneous appetitively and nonappetitively motivated behavior, food and water intake, and aggression are reviewed. Disparate findings are discussed and attributed mainly to differences in dosage and experimental procedure. It is suggested that in a number of instances the effects of cannabis are similar to those of anticholinergic drugs. Guidelines for future research are suggested.

MILLER, L. and DREW, W.G. Effects of marijuana on recall of narrative material and Stroop colour-word performance. Nature 237: 172-173 (May, 1972)

MILLER, L.L. and DREW, W.G. Impairment of latent learning in the rat by a marihuana component. Nature 243: 473-474 (June, 1973)

MILLER, L.L., DREW, W.G. and JOYCE, P. Delta-9-THC: Effect on acquisition and retention of a one-trial passive avoidance response. Behavioral Biology 8(3): 421-426 (March, 1973)

In two separate experiments, the effect of 5 or 15 mg/kg delta-9-THC on acquisition and retention of a one-trial passive avoidance in rats was investigated. Neither dose affected passive avoidance. However, THC at 5 mg/kg appeared to interfere with retention using an active retest procedure, only if an S was retested under the influence of the drug. It was concluded that the drug could have some specific effect on performance rather than memory.

MILLER, L., DREW, W.G. and McCOY, D.F. Effects of post-trial injections of scopolamine and eserine on acquisition of a simultaneous brightness discrimination. Psychological Reports 29: 1147-1152 (1971)

4 groups of rats were given injections of scopolamine, methylscopolamine, eserine or saline immediately following the completion of an acquisition trial on a brightness discrimination in a T-maze. Results indicated that eserine and scopolamine groups displayed little or no reduction in errors over 50 acquisition trials, while Ss treated with methylscopolamine or saline showed a marked reduction in errors over the last 15 trials. While the data can be interpreted in terms of a consolidation model of memory, a progressive increase in failures to eat on rewarded trials by groups receiving the centrally active drugs, indicates that side effects of these drugs probably played a role in learning impairments.

MILLER, L.L., DREW, W.G. and WIKLER, A. Comparison of delta-9-THC, LSD-25 and scopolamine on non-spatial single alternation performance in the runway. Psychopharmacologia 28: 1-11 (1973)

Rats were trained in a straight runway on a non-spatial single alternation (NSSA) which involved presentation of reward (R) and nonreward (N) in a fixed repeating sequence (i.e. R-N-R-N...). Patterned running results since rats learned to run fast on R trials and slow on N trials. This task can be regarded as an animal analog of the goal directed serial alternation task employed with humans. After patterned running was well established the effects of graded doses of delta-9-THC, LSD and scopolamine were delineated. Although all drugs modified alternation performance, each agent produced distinctly specific effects on the different components of NSSA. Delta-9-THC disrupted alternation by decreasing running speed on R trials and increasing running speed on N trials. Lower doses of LSD increased running speed on N trials while leaving R trial speeds unchanged. At the highest dose, LSD decreased running speed on R trials while leaving N trial speeds only slightly elevated from baseline. Scopolamine disrupted alternation solely by decreasing speed on R trials. The results were discussed with reference to the effects of these drugs on internal inhibition, registration and recall of internal cues and timing behavior.

MIYASAKA, M. and DOMINO, E.F. Neuronal mechanisms of ketamine-induced anesthesia. International Journal of Neuropharmacology 7: 557-573 (1968)

MOLANDER, L. and RANDRUP, A. Investigation of the mechanism by which L-DOPA induces gnawing in mice. Acta Pharmacologica et Toxicologica 34: 312-324 (1974)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

MORETON, J.E. and DAVIS, W.M. Effects of delta-9-tetrahydrocannabinol on locomotor activity and on phases of sleep. The Pharmacologist 12(2): 258 (1970)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

MORETON, J.E. and DAVIS, W.M. Electroencephalographic study of effects of delta-9- and delta-8-tetrahydrocannabinol and cannabis extract on sleep in the rat. The Pharmacologist 13(2): 246 (1971)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

MORETON, J.E. and DAVIS, W.M. Electroencephalographic study of the effects of tetrahydrocannabinols on sleep in the rat. Neuropharmacology 12: 897-907 (1973)

For abstracts, see Section III. Mechanisms of Action of Different Drugs.

MORETON, J.E., ROEHRS, T. and KHAZAN, N. Sleep-awake activity and self-injection pattern of rats dependent on morphine, methadone, or L-alpha-acetyl-methadol (LAAM). Federation Proceedings 33: 516 (1974)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

MORETON, J.E., ROEHRS, T., KHAZAN, N. and Merrell-National Laboratories. Patterns of drug self-administration and sleep-awake activity during the state of dependence on morphine, methadone, and L-alpha-acetylmethadol (LAAM). Committee on Problems of Drug Dependence. Washington, D.C.: National Academy of Sciences, National Research Council, 1974.

Rats prepared with chronic cortical EEG and EMG electrodes and with i.v. cannulas were permitted to self-administer morphine (10 mg/kg/injection) on a fixed ratio schedule of reinforcement to establish physical dependence. When methadone (2 mg/kg/injection) or LAAM (1 mg/kg/injection) was substituted for morphine, these dependent rats titrated the daily drug intake and maintained the dependence state. A significant shift from inter-injection intervals of 2.5 $\pm$ for morphine to shorter intervals of 1.4 $\pm$ 0.1 hours was noted for methadone and to much longer intervals for LAAM (8.8 $\pm$ 0.8 hours). While the distribution of sleep, REM sleep, and awake during these inter-injection intervals was, in general, analogous, LAAM exhibited a relatively delayed onset of action. However, EEG slow bursts emerged with little delay following LAAM injections which may represent, in part, a significant agonistic property.

MORETON, J.E., YOUNG, G.A., MELTZER, L. and KHAZAN, N. Effects of naloxone on post-addict rats relapsing to morphine self-administration. Presented at Federation Meetings, Atlantic City, New Jersey, April, 1975.

Female Sprague-Dawley rats were prepared with chronic cortical and muscle electrodes and i.v. cannulas. They were administered morphine by i.p. injections, then trained to lever press for i.v. self-injections or morphine (10 mg/kg) to maintain dependence, and subsequently withdrawn for two weeks. At this point, one or two pellets of naloxone base (100 mg) or placebo pellets were implanted subcutaneously. The rats were then returned to the experimental cages and allowed to self-administer morphine or isotonic saline. Rats that were implanted with two 100 mg naloxone pellets did not relapse to morphine self-injections. Although half of the rats implanted with one 100 mg pellet also failed to relapse to morphine, the remainder increased their lever pressing and morphine intake sufficiently to overcome the antagonistic effect of naloxone and to re-establish dependence. Rats implanted with placebo pellets and given access to morphine re-established lever pressing, while those given access to isotonic saline extinquished their lever pressing. These findings demonstrate the ability of the narcotic antagonist, naloxone, to interfere with relapse to morphine in post-addict rats.

MORSE, W.H. and KELLEHER, R.T. Schedules as fundamental determinants of behavior. The Theory of Reinforcement Schedules. Edited by W.N. Schoenfeld. New York: Appleton-Century-Crofts, 1970. Pp. 139-185.

MOSKOWITZ, H. and McGLOTHLIN, W. Effects of marihuana on auditory signal detection. Psychopharmacologia 40: 137-145 (1974)

23 male subjects were tested for auditory signal detection under a no-treatment condition, and smoke marihuana conditions containing 0, 50, 100 and 200 mu-g delta-9-THC per kg body weight. Signal detection was measured under conditions of concentrated attention, in which the subject reported the presence or absence of a tone in 3-sec noise burst; and divided attention, where the subject also repeated a series of six digits which were presented simultaneously with the noise burst. No differences were found between the no-treatment and placebo conditions. Significant dose-dependent impairment of signal detection resulted for the marihuana conditions under both concentrated and divided attention. Application of signal setection theory indicated that impaired performance was due to a decline in sensitivity (d'), independent of changes in subject criteria (beta). There was also some indication of change in criteria--a greater tendency for erroneous reporting of a signal when it was not present.

MOSKOWITZ, H. and SHARMA, S. Eye movements during a signal detection task under marihuana. Perception and Psychophysics (in press)

MOSKOWITZ, H., SHARMA, S. and McGLOTHLIN, W. Effect of marihuana upon peripheral vision as a function of the information processing demands in central vision. Perceptual and Motor Skills 35: 875-882 (1972)

Detection of peripheral light stimuli was examined with 12 Ss under 4 treatment units of smoked marihuana. Marihuana severely impaired detection performance and the decrement was linearly related to dose. Information-processing demands from the central fixation light did not affect the degree of impairment.

MOSKOWITZ, H., SHARMA, S. and SCHAPERO, M. A comparison of the effects of marijuana and alcohol on visual functions. Current Research in Marihuana. Edited by M.F. Lewis. New York: Academic Press, 1972.

MOSKOWITZ, H., SHEA, R. and BURNS, M. Effects of marihuana on the psychological refractory period. Perceptual and Motor Skills 38: 959-962 (1974)

Reaction times to an auditory stimulus (RT_1) and a subsequent visual stimulus (RT_2) were measured for 12 Ss under three levels of smoked marihuana. Marihuana impaired responses; effect was larger on RT_2 than on RT_1. However, delays of RT_2 are longer than would be predicted in terms of the psychological refractory period.

MUNKVAD, I. The mechanism of action of psychopharmacological agtens on behaviour. Acta Pharmacologica et Toxicologica 35(Supplement I): 11 (1974)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

MUNKVAD, I., PAKKENBERG, H. and RANDRUP, A. Aminergic systems in basal ganglia associated with stereotyped hyperactive behavior and catalepsy. Brain, Behavior and Evolution 1: 89-100 (1968)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

NAKAI, Y. and DOMINO, E.F. Differential effects of pentobarbital, ethyl alcohol and chlorpromazine in modifying reticular facilitation of visually evoked responses in the cat. International Journal of Neuropharmacology 8: 61-72 (1969)

NAKAMURA, J., HENDERSON, G.L. and WINTERS, W.D. The behavioral and EEG effects of 1-alpha-aceylmethadol (LAAM) in the rat. Proceedings of the Western Pharmacological Society 17: 155-158 (1974)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

NASH, P., COLASANTI, B. and KHAZAN, N. Long-term effects of morphine on the electroencephalogram and behavior of the rat. Psychopharmacologia 29: 271-276 (1973)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

NEWMAN, L.M., LUTZ, M.P., GOULD, M.H. and DOMINO, E.F. Delta-9-THC and ethyl alcohol: Evidence for cross-tolerance in the rat. Science 175: 1022 (1972)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

NIELSEN, E.B. and LYON, M. Drinking behaviour and brain dopamine: Antagonistic effect of two neuroleptic drugs (pimozide and spiramide) upon amphetamine- or apomorphine-induced hypodipsia. Psychopharmacologia 33: 299-308 (1973)

Hypodipisia produced by injection of d-amphetamine (2.0 mg/kg) or apomorphine (0.8 mg/kg) in rats, was partially antagonized by two DA-specific neuroleptic drugs, Pimozide and Spiramide, respectively. Pimozide revealed a maximal amphetamine-antagonistic effect at dose levels between 0.1 --0.4 mg/kg. Hypodipisia could also be produced by Pimozide alone in doses greater than 1.0 mg/kg. Pretreatment of the apomorphine-induced hypodipsia with 0.05 mg/kg Spiramide also reliably counteracted drinking deficits.

The interaction of water deprivation combined with the presence or absence of food in the test situation was also examined, but no effect was found.

The possibility that perserverative rearing on the hind legs under d-amphetamine might interfere with drinking was tested with high vs. low drinking-tubes in the Pimozide-amphetamine experiments. There was evidence for a slight initial effect of drinking position, but the general form of the dose-response curve was not greatly altered.

It was concluded that dopamine effects cannot easily be excluded from a role in the control of drinking, and that the primary role often accorded norepinephrine in relation to amphetamine effects should be re-examined with respect to the specific behavioural functions which are altered.

NIELSEN, E.B. and LYON, M. Some possible mechanisms involved in amphetamine or apomorphine induced hypodipsia. Journal de Pharmacologie 5(Supplement II): 72 (1974)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

NORTON, S. Amphetamine as a model for hyperactivity in the rat. Physiology and Behavior 11: 181-186 (1973)

Exploratory behavior of saline and amphetamine-injected rats has been analyzed using time-lapse photography. Three models are proposed for the expected effects of drugs causing hyperactivity in rats. The conclusions which are reached from the analysis are that control behavior of rats under the condition employed shows a high degree of patterning and stability and that at moderately low doses amphetamine causes dose-related changes in frequency of certain behavioral acts and a shortening of the duration of an act, once it is initiated. These two actions can be assumed to encompass the effect of amphetamine described as behavioral stimulation or hyperactivity. In addition, amphetamine causes increased randomization of initiation of behavior acts. This disruption of normal behavior sequences is not detected by most methods of analysis of hyperactive behavior but has been shown here to be a dose-related phenomenon accompanying the other drug-induced changes.

O'BRIEN, C. P. Conditioning aspects of narcotics addiction. Journal of Psychiatric Research (in press)

The importance of conditioning factors in narcotic addiction and relapse has been established in animal studies and has been suggested by clinical experience. Wikler has developed a theoretical system which involves both classical and operant conditioning, but systematic studies in humans are lacking.

Stimuli which precipitate either "craving" or "sickness" were elicited from 8 former addicts, drug-free at least 6 months and 100 addicts currently undergoing methadone treatment. The subjects were able to arrange the stimuli in a hierarcy from most to least potent. Addicts were able to clearly distinguish between the symptoms of "cravings" and "sickness", but the stimuli which provoke each of these overlap. Various desensitization paradigms were utilized to extinguish the responses to these stimuli using both psychophysiological and subjective dependent variables.

One series of extinction trials involved the use of the narcotic antagonist cyclazocine. Previous studies with antagonists have assumed random experimentation with narcotics by the addict in his environment. In this study systematic extinction trials were conducted in the clinic. Heroin addicts were detoxified and permitted to inject themselves with the narcotic hydromorphone (Dilaudid) under bouble-blind saline controlled conditions, while maintaining their usual rituals. Baseline responses were obtained. After a blocking dose of cyclazocine was achieved, thrice weekly extinction trials were conducted consisting of self-injections of either saline or hydromorphone under double-blind conditions.

Results with 15 patients to date indicate that, (1) the procedure is acceptable to patients; (2) all injections even saline, are pleasureable initially, but after 10-15 trials they have become neutral and continued injections become increasingly aversive; (3) self injections in the clinic are generalized to other environments according to patient reports (supported by frequent urine tests); (4) pupillometry is the best measure of pharmacological "high", but conditioned constriction to the injection of saline may occur; (5) video tapes and slides of addicts "shooting up: are potent stimuli for most addicts and post-addicts, but not for individuals who have undergone extinction trials.

This treatment technique is still in a preliminary stage of development. The drop-out rate due to cyclazocine side effects is high (up to 50 per cent), but this should be reduced by naltrexone, an antagonist with few side effects. It remains to be seen whether relapse occurs after termination of antagonist when the patients know that getting narcotic effects is again possible.

O'BRIEN, C. P. The role of conditioning in narcotic addiction. International Symposium on Behavior Modification. Edited by E. Chirinos (in press)

OGLESBY, M. W., ROSENBERG, J. and WINTER, J. C. Behavioral and biochemical effects of chronic administration of bromide in the rat. Psychopharmacologia 32: 85-92 (1973)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

OLSON, J. and CARDER, B. Behavioral tolerance to marihuana as a function of amount of prior training. Pharmacology Biochemistry and Behavior 2(2): 243-247 (1974)

Rats were trained to run an alley for food reinforcement. Rats dosed with marihuana distillate before each session from the beginning of training showed a very slow improvement of performance during training. Rats that first received marijuana after reaching asymptotic performance showed a disruption of performance under the drug. These rats, however, rapidly developed a tolerance to the drug. It was concluded that increased prior training increases the rate of behavioral tolerance development.

OVERTON, D.A. Experimental methods for the study of state-dependent learning. Federation Proceedings 33(7): 1800-1813 (July, 1974)

Drugs produce a variety of effects on performance, on the formation of memories, and on their retrieval. One of these effects is state-dependent learning. To study state-dependent learning, investigators commonly use a 2 x 2 experimental design in which four groups are first trained and then tested for recall under the conditions N-N, N-D, D-N and D-D, respectively (N = no drug, D = drug). However, this design generally does not provide sufficent data to allow an evaluation of the relative strengths of the various possible drug effects. As a result, impaired performance caused by other drug effects frequently attributed to state-dependent learning and vice versa. The limitations of this design are discussed and alternative strategies are proposed. If a drug produces only a weak state-dependent learning effect, learned behaviors may be made contingent on the drug state by a "drug discrimination" training procedure. Such procedures are currently being used to answer a variety of questions about drug actions on the brain. This paper discusses available experimental methods, with emphasis on methods for deriving dose-response relationships, on the interpretation of transfer test results, on methods that allow quantitive and qualitative comparisons of the discriminable effects of various drugs, and on the limitations of each method. It is concluded that drug discrimination procedures are less prone to yield erroneous conclusions that is the 2 x 2 experimental design. Data obtained with rats in a shock escape T-maze task are presented to illustrate some of the properties and limitations of drug descrimination procedures.

OVERTON, D.A. State-dependent learning produced by addicting drugs. Opiate Addiction: Origins and Treatment. Edited by S. Fisher and A.M. Freedman. Washington, D.C.: V.H. Winston and Sons, Inc., 1974.

Available evidence increasingly supports the generalization that state-dependent learning (SDL) is produced by most abused drugs. This suggests that studies of SDL may predict the abuse potential of drugs, and also raises the possibility that SDL may be cuasally involved in the addictive process. Although no explicit relationship between drug abuse and SDL has been demonstrated, experimental studies of this question have only recently begun. This paper will selectively review data on SDL which appear related to drug abuse, and will summarize the major theoretical formulations which have been put forward relating SDL to abuse.

OVERTON, D.A. State-dependent retention of learned responses produced by drugs: Its relevance to sleep learning and recall. Sleep: Physiology, Biochemistry, Psychology, Pharmacology, Clinical Implications. Edited by W.P. Koella and P. Levin. Proceedings of First European Congress on Sleep Research. Basel, Switzerland: Karger, 1973.

Several drugs produce an effect called SDL. If a response is learned while an animal is drugged it can thereafter be performed best when the animal is again drugged, and it is performed more poorly or not at all in the absence of drug. Data by EVANS et al. (1970) suggest that some types of learning which can take place during REM sleep are smimlarly retrievable only during subsequent REM periods and cannot be remembered when the subject is awake. Thus drugs and REM sleep appear to have effects on memory and retention which are at least formally similar. Such drug effects have been extensively studied and this paper attempts to extrapolate from the drug literature as regards the state dependency effects which sleep might produce and the experimental mehtodology which might be useful in demonstrating such effects. This paper is explicitly speculative, and is not intended to imply that drugs and sleep acutally do have similar effects on learning and retention, beyond those shown by the data.

OVERTON, D.A. and LEBMAN, R.I. Rapid drug discrimination produced by ketamine, a dissociative anesthetic. Proceedings of the 81st Annual Convention of the American Psychological Association. Washington, D.C.: The American Psychological Association, 1973. Pp. 1007-1008.

OVERTON, D.A. and WINTER, J.C. Discriminable properties of drugs and state dependent learning. Federation Proceedings 33(7): 1785-1786 (1974)

PAPESCHI, R. An investigation on the behavioral and hypothermic effects of yohimbine: Interaction with drugs affecting central and peripheral monoamines. Archives internationales de Pharmacodynamie et de Therapie 208: 61-80 (1974)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

PAPESCHI, R., RANDRUP, A. and LAL, S. Effect of ECT on dopaminergic and noradrenergic mechanisms. I. Effect on the behavioural changes induced by reserpine, alpha-methyl-p-tyrosine or amphetamine. Psychopharmacologia 35: 149-158 (1974)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

PARRY, H.J. Patterns of psychotropic drug use among American adults. Journal of Drug Issues 1: 269-273 (1971)

PARRY, H.J. Use of psychotropic drugs by U.S. adults. Public Health Reports 83(10): 799-810 (October, 1968)

PARRY, H.J. and CISIN, I.H. Students, parents, and drugs. Today's Education: NEA Journal (May, 1973)

PARRY, H.J., CISIN, I.H. and BALTER, M.B. Concomitants of marihuana use among Americans aged 18-29. Special Report D-1. Washington, D.C.: Social Research Group, The George Washington University, 1972.

PATRICK, G.A., DEWEY, W.L. and HARRIS, L.S. Relationship of brain morphine concentration to tail-flick activity in pellet-implanted and acutely treated mice and rats. Federation Proceedings 33(3, Part I): 474 (March, 1974)

Brain morphine (M) levels were measured according to a modification of the fluorometric method in animals in which the tail flick test was performed. In mice implanted S.C. with M pellets, significant analgesia was observed 20 mins after implantation though brain M was not measurable. Increased analgesia paralleled increased brain M at 1 and 4 hours after implantation. By 24 hrs analgesia had begun to decline and was entirely absent at 72 hrs, though brain M levels remained elevated through 78 hrs. When the M pellets were removed at 72 hrs, brain M declined steadily, returning to zero 6 hrs later. These data suggest that the encapsulation observed around the pellet does not greatly interfere with the absorption

Patrick, G.A., Dewey, W.L. and Harris, L.S....continued of M. Brain M levels were found to correlate with S.C. doses of morphine sulfate (MS) and tail flick activity in mice and rats. In mice the brain M level at the ED50 was found to be 140NGS/G tissue. Following a single S.C. injection of 8MGS/KG of MS, mouse brain M levels peaked at 30 mins after injection, corresponding to peak analgesic effect. In rats, an injection of 16MGS/KG S.C. produced peak brain M levels and peak analgesia at 45 to 60 mins after administration.

PETERSON, D.W. and SPARBER, S.B. Increased fixed-ratio performance and differential d- and l-amphetamine action following norepinephrine depletion by intraventricular 6-hydroxydopamine. The Journal of Pharmacology and Experimental Therapeutics 191(3):349 (1974)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

PICKENS, R. and HARRIS, W.C. Self-administration of d-amphetamine by rats. Psychopharmacologia 12: 158-163 (1968)

PICKENS, R. and PLUNKETT, C.R. Morphine self-administration by rats: Confounding activity effects. Committee on Problems of Drug Dependence. Washington, D.C.: National Academy of Sciences, National Research Council, 1970. Pp. 6592-6597.

PICKENS, R. and THOMPSON, T. Cocaine-reinforced behavior in rats: Effects of reinforcement magnitude and fixed-ratio size. The Journal of Pharmacology and Experimental Therapeutics 161(1): 122-130 (May, 1968)

Cocaine was shown to serve as a reinforcer for the rat. The effects of different infusion doses and fixed-ratio schedules on cocaine self-administration were studied. Within the range of doses that maintained responding, the response rate was found to vary inversely as a function of drug dose per infusion (reinforcement magnitude) and directly as a function of size of the fixed ratio. Outside this range, low doses produced ragged performance and high doses caused responding to cease entirely. In general, ratio performance was somewhat dependent on reinforcement magnitude, with higher ratios being achieved by intermediate and higher drug doses. Food reinforcement under conditions resembling those used with cocaine also yielded an inverse relationship between reinforcement magnitude and response rate, reconciling what appeared to be a major difference between the reinforcers. The most striking characteristic of cocaine-reinforced behavior was long but regularly spaced pauses after reinforcement. Comparable pauses were obtained in food-reinforced fixed-ratio performance after cocaine infusion, suggesting the effect may be due at least in part to performance disruption produced by the drug.

PICKENS, R. and THOMPSON, T. Simple schedules of drug self-administration in animals. Drug Addiction: Experimental Pharmacology, Vol. 1. Edited by J. Singh, L.H. Miller and H. Lal. Mount Kisco, New York: Futura Publishing Company, 1972. P. 107.

PICKENS, R., THOMPSON, T. and YOKEL, R.A. Characteristics of amphetamine self-administration by rats. Current Concepts on Amphetamine Abuse. Edited by E.H. Ellinwood, Jr. and S. Cohen. Washington, D.C.: U.S. Government Printing Office, 1972.

PILLARD, R.C. and FISHER, S. Effects of chlordiazepoxide and secobarbital on film-induced anxiety. Psychopharmacologia 12: 18-23 (1967)

Normal college students were given a single dose of chlordiazepoxide, secobarbital or placebo 85 min before being shown an anxiety-inducing film. Measures of sedation and of subjective anxiety were taken before and after the film. Results indicate that chlordiazepoxide and secobarbital had a measurable sedative action compared with placebo. Neither medication showed a significant anti-anxiety effect.

PIRAINO, A.J. and DiGREGORIO, G.J. Quantitation of barbiturates in the induced parotid saliva of rats. The Pharmacologist 16: 217 (1974)

PIRCH, J.H. and OSTERHOLM, K.C. Influence of alpha-methyltyrosine on enhancement of shuttle-box avoidance by marijuana and pentobarbital. Research Communications in Chemical Pathology and Pharmacology 8(2): 203 (June, 1974)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

PRYOR, G.T. Acute and subacute behavioral and pharmacological interactions of delta-9-THC with other drugs. Proceedings of the International Conference on the Pharmacology of Cannabis, Savannah, Georgia, December 3-6, 1974 (in press)

Using a battery of tests - conditioned avoidance behavior, photocell activity, heart rate, body temperature, and rotarod performance - we have evaluated some of the interactions between delta-9-THC (5.0 or 10 mg/kg in sesame oil administered intragastrically) and thirteen other drugs - phenobarbital, nicotine, caffeine, diphenylhydantoin, desmethylimipramine, aspirin, methamphetamine, tolbutamide, chlordiazepoxide, methaqualone, cocaine, LSD-25, and phencyclidine.

The interactions were studied after acute administration and after subacute pretreatment for six days with delta-9-THC or the test drug. In these initial studies only one or two doses of delta-9-TCH and each test drug were evaluated. Delta-9-THC was administered 2 hours and the test drug 30 minutes before each test.

The results, while complex and subject to further verification using other dose and time parameters and other test systems, suggest that the depressant effects of delta-9-THC tend to predominate. In general if the test drug was depressant (even though the dose used was ineffective alone), it added to or potentiated the depression caused by delta-9-THC. If the drug was stimulant, this property was antagonized and the depressant properties of delta-9-THC were predominant. Tolerance developed to many of the effects of delta-9-THC and this tolerance extended to its interactions with most other drugs. On the other hand, the tolerance that developed to some drugs did not always attenuate their interactive effects with delta-9-THC and some showed cumulative effects that enhanced the depression caused by acute administration of both.

PURI, S.K. and LAL, H. Effect of dopaminergic stimulation or blockade on morphine-withdrawal aggression. Psychopharmacologica 32: 113-120 (1973)

Aggregation during morphine abstinence elicited social aggression (rearing, vocalization, attack-bites) in the morphine dependent rats. Pretreatment with L-dihydroxyphenylalanine (50 mg/kg), DL-dihydroxyphenylalaine (200 mg/kg), dextro-amphetamine sulfate (2 mg/kg) or apomorphine hydrochloride (1.25 mg/kg) enhanced that aggression severalfold. Alpha methyl-p-tyrosine (200 mg/kg) abolished the morphine withdrawal aggression that was elicited either by mere aggregation or by aggregation combined with amphetamine. However, alpha methyl-p-tyrosine did not block the aggression in apomorphine treated rats. Haloperidol (0.63-2.5 mg/kg) also blocked the aggression due to mere abstinence or abstinence supersensitized by amphetamine. Similarly, methadone hydrochloride (5-20 mg/kg) blocked morphine withdrawal aggression supersensitized by apomorphine. These data are intepreted to suggest dopaminergic basis of morphine withdrawal aggression and a latent supersensitivity of dopaminergic neuropathways during morphine dependence.

PURI, S.K. and LAL, H. Reduced threshold to pain induced aggression specifically related to morphine dependence. Psychopharmacologia 35: 237-241 (1974)

Male rats of Long-Evans strain were chronically administered increasing doses until a maximally tolerated maintenance-dose of morphine (400 mg/kg/day), phenobarbital (400 mg/kg/day), ethanol (20 ml of 50% v/v/day) or amphetamine (16 mg/kg/day) was reached. After several days of maintenance doses, the rats were withdrawn from those drugs. When grouped, morphine-withdrawn rats showed intermittent spontaneous-aggression (rearing, vocalization, attack-bites). Amphetamine (2 mg/kg) treatment potentiated morphine withdrawal aggression. However, animals withdrawn from phenobarbital, ethanol or amphetamine failed to show spontaneous aggression with or without amphetamine. Similarly, shock intensity required to elicit pain-induced aggression was significantly decreased in morphine-withdrawn rats but not in rats withdrawn from phenobarbital, ethanol or amphetamine. These results suggest that the aggression seen during abstinence is caused by specific changes in the central nervous system uniquely produced by the chronic administration of narcotic drugs.

QUOCK, R.M. and HORITA, A. Apomorphine: Modification of its hyperthermic effect in rabbits by p-chlorophenylalanine. Science 183: 539 (1974)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

RANDRUP, A. and MUNKVAD, I. Behavioural stereotypies induced by pharmacological agents. Pharmakopsychiatrie. Neuro-Psychopharmakologie 1: 18-26 (1968)

The word stereotypy is used in psychiatry, psychology and psychopharmacology to designate different forms of behaviour. The present paper deals with a very spectacular form of stereotyped behaviour produced in many animal species by amphetamine and other stimulant drugs.

Evidence is presented which indicates that this stereotypy is associated with a certain form of behavioural stimulation produced by action of the stimulant drugs upon a dopaminergic system in the basal ganglia.

"Amphetamine-psychosis" observed in the clinic shows many symptoms similar to those seen in certain forms of schizophrenia (including stereotypy), and the stereotypies produced by amphetamine in animals are specifically antagonized by neuroleptic drugs, used for the treatment of schizophrenia. On this basis the relation of these stereotypies to psychopharmacology is pointed out, and it is suggested as a working hypothesis that the dopaminergic system in the basal ganglia may be involved in the pathogenesis of schizophrenia.

RANDRUP, A. and MUNKVAD, I. Biochemical, anatomical and psychological investigations of stereotyped behavior induced by amphetamines. Amphetamines and Related Compounds: Proceedings of the Mario Negri Institute for Pharmacology Research, Milan, Italy. Edited by E. Costa and S. Gorattini. New York: Raven Press, 1970. Pp. 695-713.

For abstract, see Section III. Mechanisms of Action of Different Drugs.

RANDRUP, A. and MUNKVAD, I. Brain dopamine and amphetamine induced stereotyped behaviour. Acta Pharmacologia et Toxicologia 25(Supplement 4): 62 (1967)

RANDRUP, A. and MUNKVAD, I. Correlation between specific effects of amphetamines on the brain and on behavior. Current Concepts on Amphetamine Abuse. Edited by E.H. Ellinwood, Jr. and S. Cohen. Washington, D.C.: U.S. Government Printing Office, 1972.

For abstract, see Section III. Mechanisms of Action of Different Drugs.

RANDRUP, A. and MUNKVAD, I. Influence of amphetamines on animal behaviour. Stereotypy, functional impairment and possible animal-human correlations. Psychiatria, Neurologia, Neurochirurgia 75: 193-202 (1972)

The behavioural stimulation of animals brought about by amphetamines is selective: certain activities (items of behaviour) are increased and others concurrently decreased. With increasing doses of amphetamine this leads to an extremely stereotyped activity, consisting of continuous repetition of one or a few items of behaviour.

The selective stimulation causes impairment of the functional capacity of the animals, e.g. by derangements of operant and social hebaviour.

Possible human-animal correlations and implications for the clinic (amphetamine addiction, schizophrenia) are discussed.

The biochemical actions of amphetamine underlying the behavioural effects are not discussed here, but reference is made to recent reviews by the authors published elsewhere and to other papers in the present symposium.

RANDRUP, A. and MUNKVAD, I. Mechanisms by which amphetamines produce stereotypy, aggression and other behavioural effects. VIII. Congress Collegium International Neuro-Psychopharmacologicum, Copenhagen. Praha: Avicenum Press, 1972.

For abstract, see Section III. Mechanisms of Action of Different Drugs.

RANDRUP, A. and MUNKVAD, I. Mechanisms by which amphetamines produce stereotypy, aggression and other behavioural effects. Psychopharmacologia 26(Supplement): 37 (1972)

For abstract, see Section II. Drug Chemistry and Metabolism.

RANDRUP, A. and MUNKVAD, I. Pharmacological studies on the brain mechanisms underlying two forms of behavioural excitation: Stereotyped hyperactivity and "rage." Annals of the New York Academy of Sciences 159: 928-938 (1969)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

RANDRUP, A. and MUNKVAD, I. Roles of brain noradrenaline and dopamine in pharmacelogically induced aggressive behaviour. Symposium on Pharmacological Agents and Biogenic Amines in the Central Nervous System. Edited by J. Knoll and K. Magyar. Budapest, Hungary: Akademiai Kiado, 1973. Pp. 131-139.

RANDRUP, A. and MUNKVAD, I. Stereotype behavior produced by amphetamine and other substances. Neuro-Psychopharmacology, Vol. 5. Edited by H. Brill, J.O. Cole, P. Deniker, H. Hippius and P.B. Bradley. Amsterdam, the Netherlands: Excerpta Medica Foundation, 1967. P. 1225.

For abstract, see Section III. Mechanisms of Action of Different Drugs.

RANDRUP, A. and MUNKVAD, I. Various forms of stereotype activity produced by amphetamine in certain animal species and man. Neuropsychopharmacology, Vol. 5. Edited by H. Brill, J.O. Cole, P. Deniker, H. Hippius and P.B. Bradley. Amsterdam, the Netherlands: Excerpta Medica Foundation, 1967. P. 1224.

In earlier papers we have reported pharmacological investigations of stereotype sniffing activity produced in rats by moderate doses of amphetamine (about 3 mg/kg s.c.). Although the sniffing (accompanied by licking and biting of cage wires) is highly characteristic of this stereotype behavior, other forms of stereotype can be produced in rats by smaller doses of amphetamine.

We have extended these behavioral observations by giving amphetamine to some other animals: mice, guinea pigs, cats and squirrel monkeys. In all these species we could produce stereotype behavior, but the form of stereotypy differed from species to species, including sniffing, biting, movements of head, trunk or extremities, repetition of certain repertoires etc. This indicates that it is not the form of activity, but stereotypy as such, which is the most characteristic feature of the abnormal behavior produced by amphetamine. Other behavioral features were also observed and recorded in several species e.g. decrease in normal activities such as grooming and locomotion. Elements of aggressive or fearful behavior (fighting, "freezing", vocalization) were occasionally seen.

This evidence made us review the clinical literature about amphetamine psychosis in man, and some case reports describing various forms of stereotype activities were found. Decreased locomotion as well as fear, rage and acts of violence are also on record.

Randrup, A. and Munkvad, I. Various forms...continued

The results of this comparison between species will be discussed in relation to: firstly, the use of amphetamine stereotypies in rats as a screening test for neuroleptica, and secondly, the similarity between symptoms of amphetamine psychosis in man and symptoms of schizophrenia.

RANDRUP, A., MUNKVAD, I., FOG, R., KJELLBERG, B., LYON, M., NIELSEN, E., SVENNILD, I. and SCHIØRRING, E. Behavioural correlates to antipsychotic efficacy of neuroleptic drugs. Presented at the International Symposium on Antipsychotic Drugs, Pharmacodynamics and Pharmacokinetics, Stockholm, Sweden, September 17-19, 1974.

RANDRUP, A., MUNKVAD, I. and SCHEEL-KRÜGER, J. Mechanisms by which amphetamines produce stereotypy, aggression and other behavioural effects. Proceedings of the Symposia held at the VIII Congress of the Collegium Internationale Neuro-Psychopharmacologicum, Copenhagen, Denmark, August 14-17, 1972. Edited by T.A. Ban, J.R. Boissier, G.J. Gessa, H. Heimann, L. Hollister, H.E. Lehmann, I. Munkvad, H. Steinberg, F. Sulser, A. Sundwall and O. Vinar. Amsterdam, the Netherlands: North Holland Publishing Company, 1973.

For abstract, see Section I. Methodology of Drug Research.

REGELSON, W., BUTLER, J.R., SCHULTZ, J., KIRK, T., PEEK, L. and GREEN, M.L. Delta-9-tetrahydrocannabinol (Delta-9-THC) as an effective antidepressant and appetite stimulating agent in advanced cancer patients. Presented at the International Conference on the Pharmacology of Cannabis, National Institute on Drug Abuse, December 3-6, 1974.

RENAULT, P.F., SCHUSTER, C.R., FREEDMAN, D.X., SIKIC, B., de MELLO, D.N. and HALARIS, A. Repeat administration of marihuana smoke to humans. Archives of General Psychiatry 31: 95-102 (July, 1974)

Tolerance to marihuana was investigated in two experiments. Four men were given smoke from 435 mg of marihuana (1.5 delta-9-tetrahydrocannabinol (THC)) twice a day for ten days preceded and followed by three days of a placebo twice a day; three additional men were given a higher dose (2.8% THC).

Time estimation was disrupted on the higher dose and gradually improved. Heart rate increase did not show tolerance. Enhancement of postural cradiovascular responses, when present, decreased in duration in three subjects. One developed a brief toxic psychosis, another pneumonitis of uncertain etiology. Dysphoric and psychotoxic effects were evident as a cumulative effect of the high dose.

Three additional men were given the low dosage once a week for six to eight weeks, and time estimation and heart rate changes were similar to those seen with frequent administration at that dose. Tolerance, recently reported in man, probably requires more frequent administration or a different dosage than the schedules employed here.

ROBUSTELLI, F., GLICK, S.D., GOLDFARB, T.L., GELLER, A. and JARVIK, M.E. A further analysis of scopolamine impairment of delayed matching with monkeys. Communications in Behavioral Biology 3: 101-109 (March, 1969)

The effect of intramuscular administration of scopolamine hydrobromide was studied in a thirst motivated delayed matching test with monkeys. Four different delay intervals were randomly presented: 0 sec., 2 sec., 8 sec. and 32 sec. In addition, trials of simultaneous matching were given, also in randomized order. Both accuracy and response rate were impaired by the drug under all delay conditions, as well as in the simultaneous matching. In a second series of experiments, the motivational level of the subjects was varied. A decrease of this level produced a decrease of response rate, and impaired accuracy. An increase of the motivational level resulted in an increase of response rate, with an improvement in accuracy. In the scopolamine treated animals the increase of the motivational level could counteract the scopolamine produced descrease of response rate, though accuracy was still impaired. Results are discussed in relation to the main hypotheses so far suggested of the behavioral effects of anticholinergic substances. Short term memory deficit or competitive responses disinhibition hypotheses seemed not to be confirmed. Furthermore, manipulation of the motivational variable suggested that, though scopolamine produced a decrease of the motivational level, this decrease could not account for all of the impairment of the delayed response performance. A perceptual or an associative disturbance seemed, therefore, to be the most likely cause for the residual part of such impairment.

ROEHRS, T. and KHAZAN, N. REM sleep rebound and EEG correlates in methadone dependent rats upon withdrawal. The Pharmacologist 15: 167 (1973)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

ROFFMAN, M., REDDY, C. and LAL, H. Control of morphine-withdrawal hypothermia by conditional stimuli. Psychopharmacologia 29: 197-201 (1973)

Male rats were given increasing doses of morphine sulfate to cause addiction. Each injection was paired with a bell. After a number of pairings, the bell acquired conditional-stimulus property in that, like morphine, it prevented withdrawal hypothermia during 72 h of withholding morphine. In another group the withdrawal hypothermia was precipitated by withholding of morphine injections. The bell reversed that hypothermia.

ROLINSKI, Z. and SCHEEL-KRÜGER, J. The effect of dopamine and noradrenaline antagonists on amphetamine induced locomotor activity in mice and rats. Acta Pharmacologica et Toxicologica 33: 385-399 (1973)

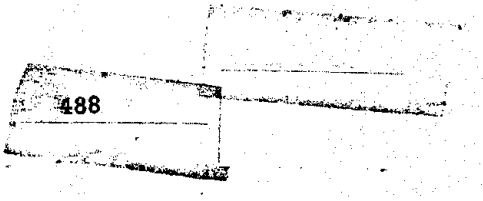
The effect of noradrenaline antagonists, aceperone, phenoxybenzamine and dihydroergotamine and neuroleptic drugs with dopamine receptor blocking properties, i.e. haloperidol, perphenazine, trifluperazine, spiramide and pimozide was tested on the locomotor and rearing activity induced by amphetamine, 25 mg/kg, in rats. In general it was found that the neuroleptic drugs in very low doses, haloperidol, 0.10 mg/kg; perphenazine, 0.05 mg/kg; trifluperazine, 0.15 mg/kg; spiramide, 0.05 mg/kg and pimozide, 0.15 mg/kg produced complete inhibition of the amphetamine activities, whereas much higher doses of aceperone, 20 mg/kg and phenoxybenzamine, 20 mg/kg only produced partial antagonism. Dihydroergotamine (20 mg/kg) produced no significant effect on the amphetamine locomotor and rearing activity. In mice trifluperazine (0.2 and 0.4 mg/kg) produced a very marked inhibitory effect, whereas spiramide (0.15 and 0.20 mg/kg) produced a significant but short-lasting effect on the locomotor activity after 4 and 8 mg/kg d-amphetamine. Aceperone (5 and 10 mg/kg and phenoxybenzamine (10 mg/kg) also produced a strong antagonistic effect on the motility. Furthermore mu-methyltyrosine (250 and 350 mg/kg), an inhibitor of the biosynthesis of dopamine and noradrenaline, produced complete inhibition, whereas FLA-63 (20 and 40 mg/kg), an inhibitor of the formation of noradrenaline produced partial inhibition. In conclusion these results indicate that the locomotor effect in mice and rats after amphetamine is dependent on both dopaminergic and noradrenergic mechanisms. However, dopamine may be regarded as most significant, since the amphetamine motility only seems possible in the presence of functional active dopamine receptors.

ROSENCRANS, J.A. and SHEARD, M.H. Effects of an acute stress on forebrain 5-hydroxytryptamine (5-HT) metabolism in C.N.S. lesioned and drug pretreated rats. European Journal of Pharmacology 6: 197 (1969)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

SAGALES, T., ERILL, S. and DOMINO, E.F. Differential effects of scopolamine and chlorpromazine on REM and NREM sleep in normal male subjects. Clinical Pharmacology and Therapeutics 10: 522-529 (1969)

The study compares the effects of scopolamine, and chlorpromazine on the EEG and the EOG in sleeping subjects. Saline was used as a control. Scopolamine hydrobromide (0.006 mg. per kilogram) clearly retarded the onset of stage REM. No immediate rebound was seen in the analysis of the sleep pattern for two hours after the first recording of this stage. The total amount of REM sleep during the full period of recording was therefore diminished. The decrease in REM resulted in an increased amount of stages I and II. No significant changes were observed in stages III or IV or in the periods of wakefulness. A significant increase in body movements was noted. Methscopolamine bromide (0.0055 mg. per kilogram) did not produce any substantial modification in the pattern of sleep. Chlorpromazine hydrochloride (0.4 mg. per kilogram) produced an increase of stage III activity apparently at the expense of stage II sleep. The observed changes further support a role of cholinergic mechanisms in human REM sleep.



SASSENRATH, E.N., GOO, G.P., COWEN, J.D. and CHAOMAN, L.F. Effects of long-term chronic exposure to delta-9-tetrahydrocannabinol (THC) in the rhesus monkey. Proceedings of the Fourth Annual Meeting of the Society for Neuroscience, St. Louis, Missouri, October 20-24, 1974.

The effects of chronic daily oral drugging with THC (at 2.4 mg/kg/day) on social behavior and stress-related neuroendocrine measures in group-caged rhesus and fascicularis macaques have been studied. During the first few weeks drugging of single members of cage groups of 3 to 6 subadult or young adult rhesus monkeys, the treated subjects showed paradoxical combinations of behaviors characteristic of withdrawal, sleepiness, hyperactivity, and anxiety, with a wide range of inter-individual differences. After 6 to 9 months of drugging, a high level of behavioral tolerance had developed to the immediate effects (1 to 5 hours post drug) of THC in all subjects. In two peer groups of 3 males and 3 females each, the one drugged female in each group showed increased aggressiveness, resulting in marked rise in dominance rank for each. These females also showed a 3-months delay in pregnancy compared to 4 non-drugged female cagemates. After nine-months drugging of single members of 6 other 3 or 4-membered cage groups, there were no observed changes in basal excretion levels of epinephrine, norepinephrine, MIPG or cortisol or in ACTH-response levels of cortisol which specifically differentiated the 6 drugged subjects from their 16 non-drugged cagemates. These data suggest that the observed behavioral effects of THC are not mediated via direct action on the stress response systems monitored, but via a central action which can also affect reproductive function.

SCHANBERG, S.M. and COOK, J.D. Effects of acute and chronic methamphetamine on brain norepinephrine metabolism. Current Concepts in Amphetamine Abuse. Edited by E. Ellinwood, Jr. and S. Cohen. Washington, D.C.: U.S. Government Printing Office, 1972.

SCHECHTER, M.D. and WINTER, J.C. Effect of BOL on the LSD induced alteration of flicker discrimination in the rat. Archives internationales de Pharmacodynamie et de Therapie 196(1): 64 (1972)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

SCHECHTER, M.D. and WINTER, J.C. Effect of mescaline and lysergic acid diethylamide on flicker discrimination in the rat. The Journal of Pharmacology and Experimental Therapeutics 177(2): 461 (1971)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

SCHEEL-KRÜGER, J. Behavioural and biochemical comparison of amphetamine derivatives, cocaine, benztropine and tricyclic anti-depressant drugs. European Journal of Pharmacology 18: 63-73 (1972)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

SCHEEL-KRÜGER, J. Central effects of anticholinergic drugs measured by the apomorphine gnawing test in mice. Acta Pharmacologica et Toxicologica 28: 1-16 (1970)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

SCHEEL-KRÜGER, J. Comparative studies of various amphetamine analogues demonstrating different interactions with the metabolism of the catecholamines. European Journal of Pharmacology 14: 47-59 (1971)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

SCHEEL-KRÜGER, J. Pharmacological studies on a counter-balancing adrenergic-cholinergic system in the brain. Acta Physiologica Scandinavica 330 (Supplement): 66 (1969)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

SCHEEL-KRÜGER, J. and JONAS, W. Pharmacological studies on tetrabenazine-induced excited behaviour of rats pretreated with amphetamine or nialamide. Archives internationales de Pharmacodynamie et de Therapie 206(1): 47-65 (November, 1973)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

SCHEEL-KRÜGER, J. and RANDRUP, A. Aggressive behaviour provoked by pargyline in rats pretreated with diethyldithiocarbamate. Journal of Pharmacy and Pharmacology 20: 946-949 (1968)

SCHEEL-KRÜGER, J. and RANDRUP, A. Evidence for a cholinergic mechanism in brain involved in the tetrabenazine reversal by thymoleptic drugs. Journal of Pharmacy and Pharmacology 21: 403-406 (1969)

SCHEEL-KRÜGER, J. and RANDRUP, A. Pharmacological evidence for a cholinergic mechanism in brain involved in a special stereotyped behaviour of reserpinized rats. British Journal of Pharmacology 34(1): 217 (1968)

SCHEEL-KRÜGER, J. and RANDRUP, A. Production of a stereotyped behaviour in rats by dopamine in the absence of noradrenaline. Acta Pharmacologica et Toxicologica 25 (Supplement 4): 61 (1967)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

SCHIØRRING, E. Amphetamine induced selective stimulation of certain behaviour items with concurrent inhibition of others in an open-field test with rats. Behaviour 39: 1-17 (1971)

The main conclusions of the experiments are: 1) Amphetamine (5 mg/kg s.c.) cannot be characterized as a "general stimulant". According to the overt behaviour studied the drug has a selective stimulating action with concomitant selective inhibition, as some behaviour items increase while other simultaneously decrease. 2) Amphetamine causes disruption of behaviour patterns as well as development of new combinations of items, which are not associated in normal subjects. 3) Amphetamine can induce changes in locomotion activity: a) Increase in the pre-phase, zero in the stereotypy-phase and increase (with later normalization) in the after-phase b) the locomotion was abnormally persevering or stereotyped; several rats followed a restricted route and other types of fixed locomotion patterns (These data will be published separately).

The possible relation from the animal data to the study of stereotyped behaviour found in the psychopathology of humans, including amphetamine-addiction and the underlying brain mechanisms is discussed.

SCHIØRRING, E. Social isolation and other behavioural changes in a group of three vervet monkeys (Cercopithecus) produced by single, low doses of amphetamine. Psychopharmacologia 26: 117 (Supplement 1972)

Problems of psychopathology are closely associated with the individual in a social context. Drug effects upon group-behaviour should therefore be considered as important. The present work demonstrates the influence of low doses of amphetamine on the interaction of three vervet monkeys, using an open-field test. Individual and social behaviour patterns and items were registrated. The triadic social behaviour was significantly, selectively changed by 0.1 and 0.15 mg/kg body-weight d-amphetamine sulphate. Total isolation (no social items present) as well as various aberrations in the frequency, duration and qualitative characteristics of 2-group and 3-group activity occurred. Stereotyped self-grooming, "staring" into space, changes in the rank order of the females and the sexual pattern of the male were seen. Severe decreases in social interaction was furthermore demonstrated in experiments, where the dyadic mother/infant relationship was studied. The mother showed increased aggression and resistance against the approach of the infant. Normal social contact with the infant was replaced by isolated self-grooming or "staring". Possible parallels to clinical phenomena such as drug-addiction, psychosis, group-therapy are drawn and the importance of a psychopharmacological approach to basis science (esp. social psychology) is emphasized. Dopaminergic and noradrenergic transmitter substances are discussed in relation to the behavioural data and correlated with other, previously published, results from our laboratory.

SCHIØRRING, E. and HECHT, A. Behavioural effects of morphine in acute doses in rats and mice. Journal de Pharmacologie 5(Supplement II): 90 (1974)

Social and individual behaviour of rats and mice were studied in an open-field test. The effect of low, acute doses of morphine was different in the two species. In rats morph. (2; 3.5; 5 mg/kg) induced an increase in frequency of group formations, following and hindleg-grooming. Rearing, mutual sniffing and nose-to-nose contact postures were unchanged. 7.5 and 10 mg/kg morph. produced a bi-phasic effect, starting with a sedated phase. In mice morph. (2; 5; 10; 15 mg/kg) induced a decrease in the behavioural response. Locomotion, grooming, rearing, exploration of objects and social interaction were decreased. 100 to 150 mg/kg morph. produced a stereotyped, hyperactive locomotion pattern, without grooming or other activities.

The neurotransmitter noradrenaline is suppossed to play an important role, possibly interacting with the dopaminergic system in the basal ganglia. Stimulating properties of morph. might be of direct importance for the understanding at the psychological level of the addictive characteristics of the drug, also in human subjects. Blocking effects of apomorphine will be discussed in relation to the treatment of morphine dependence.

SCHIØRRING, E. and RANDRUP, A. "Paradoxical" stereotyped activity of reserpinized rats. International Journal of Neuropharmacology 7: 71-73 (1968)

Rats were treated with 7.5 mg/kg reserpine s.c. As expected the general effect was strong sedation, but by observations 7, 9 to 11 and 19-21 hr. after the injections nineteen out of seventy-two rats (=26%) temporarily displayed a paradoxical, stereotyped activity which is described. Some resemblance between this behaviour and the stereotypy seen in rats after amphetamine is mentioned.

SCHIØRRING, E. and RANDRUP, A. Social isolation and changes in the formation of groups induced by amphetamine in an open-field test with rats. Advances in Neuro-Psychopharmacology. Edited by O. Vinař, Z. Votava and P.B. Bradley. Amsterdam, the Netherlands: North-Holland Publishing Company, 1971. Pp. 285-298.

Groups of 8 naive male rats, placed in a large cage (open-field), were treated with d-amphetamine sulphate and the effects on their social behaviour were studied.

With a relatively small dose, 1 mg/kg, there was a change in the way groups of 3 rats or more were formed: grouping in the corners of the cage was decreased, while grouping at the walls but outside the corners was increased. With higher doses of amphetamine (3 and 5 mg/kg) there were also periods without any social interaction between the rats (social isolation).

Animal experiments on the effects of drugs upon group behaviour may be of interest in relation to drug-therapy of psychiatric patients, consequences of drug abuse and to the basal investigation of group-psychology.

SCHLANT, R.C. and NUTTER, D.O. Effect of lysergic acid diethylamide (LSD) upon ventricular function and myocardial contractility. Clinical Research 18: 72 (1970)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

SCHOENFELD, R.I. Melatonin: Effect on punished and nonpunished operant behavior of the pigeon. Science 171: 1258-1260 (1971)

Intramuscular injections of melatonin had a dose-dependent, rate increasing effect on responding maintained by a fixed-interval schedule of positive reinforcement. When a punishment contingency was added to the fixed-interval schedule, the overall rates were not increased although responding was increased during the initial part of each interval.

SCHUSTER, C.R., JR. Psychological approaches to opiate dependence and self-administration by laboratory animals. Federation Proceedings 29(1): 2-5 (January-February, 1970)

SCHUSTER, C.R. Variables affecting the self-administration of drugs by rhesus monkeys. Use of Nonhuman Primates in Drug Evaluation. Edited by H. Vagtborg. Austin, Texas: University of Texas Press, 1968. Pp. 283-299.

SCHUSTER, C.R. and THOMPSON, T. Self-administration of and behavioral dependence on drugs. Annual Review of Pharmacology 9: 483-502 (1969)

SCHUSTER, C.R. and WOODS, J.H. The conditioned reinforcing effects of stimuli associated with morphine reinforcement. International Journal of the Addictions 3(1): 223-237 (Spring, 1968)

SCHUSTER, C.R. and WOODS, J.H. The positive reinforcing properties of morphine as a function of dosage/injection. Federation Proceedings 26: 614 (1967)

Five rhesus monkeys were conditioned to respond for food and intravenous injections of morphine SO_4 on a 2.5 min. variable-interval schedule of reinforcement. One-hr. periods in each 24-hr. session were distinguished by the presentation of either a green or white light. Morphine reinforcement was available in the presence of the white light during four 1-hr. periods spaced at 6-hr. intervals. Food reinforcement was available in the presence of the green light during 1-hr. periods before and after the morphine periods. Dosages of 10, 25, 100, 250, and 1000 mu-g/kg/inj. of morphine were studied to determine their reinforcing strength. Before and after each morphine dosage was studied for 15 consecutive sessions, saline injections were programmed in lieu of morphine. In 4 of the 5 animals response rate for 10 mu-g/kg/inj. was significantly elevated above saline control levels. Drug-lever response rates increased as a function of dosage/inj. up to 100 mu-g and decreased at higher dosages. The number of drug reinforcements/day remained relatively constant over this range of dosages. Food-lever responding decreased markedly for several sessions following the withdrawal of the higher dosages of morphine.

SCHUSTER, C.R., WOODS, J.H. and SEEVERS, M.H. Reinforcement properties of cocaine and SPA as a function of unit dose. The Pharmacologist 9: 201 (1967)

Rhesus monkeys were conditioned to respond for intravenous injections of cocaine or SPA (1, 2-diphenyl-dimethyl aminoethane HCI) on a continuous reinforcement schedule. When given a 4-hr. opportunity to respond for drug each day, drug responding became stable within three weeks. After stabilization of drug responding, dosage/injection was varied. A baseline dosage/injection was chosen and changes in dosage/injection were interpolated in this baseline. The baseline intake was recovered rapidly for both drugs regardless of the change in dosage/injection. Drug intake was a sharp negatively accelerated function of dosage/injection for both drugs with the function being essentially flat from 0.1 mg/kg/inj. to 1.2. mg/kg/inj. for cocaine and from 0.25 mg/kg/inj. to 1.0 mg/kg/inj for SPA. These data suggest that different classes of pharmacological agents may be discriminated on the basis of the function relating intake to dosage/injection. A comparison to narcotics was drawn to support this generalization.

SCHUSTER, C.R., WOODS, J.H. and SEEVERS, M.H. Self-administration of central stimulants by the monkey. Abuse of Central Stimulants. Edited by F. Sjovist and M. Tottie. Stockholm, Sweden: Almquist and Wiksell, 1969.

The monkey (macacca mulatta) voluntarily initiates and maintains for long periods characteristic and reproducible patterns of self-administrative behavior for all of the common drugs of dependence. These behavioral patterns, the pharmacologic response, and the nature of psychotoxicity are strikingly similar to those of humans who abuse large quantities of drugs. This paper presents data with the central stimulants which suggest that this technic may serve as a model for the evaluation of psychological dependence for those drugs like the stimulants which do not induce physical dependence.

SCHWARTZ, A.S. and MARCHOK, P.L. Depression on morphine-seeking behaviour by dopamine inhibition. Nature 248(5445): 257 (March, 1974)

SCHWARTZ, A.S. and MARCHOK, P.L. Depression of morphine-seeking behavior in the rat by haloperidol. Committee on the Problems of Drug Dependence. Washington, D.C.: National Academy of Sciences, National Research Council, 1974.

SCHWIN, R., HILL, S.Y., GOODWIN, D.W. and POWELL, B. Marihuana and critical flicker fusion. The Journal of Nervous and Mental Disease 158(2): 142-144 (1974)

Critical flicker fusion (CFF) has been used extensively in studying the physiology of vision. CFF refers to the minimal number of successive flashes of light per second that produces a sensation of steady light. The fusion threshold is affected by a variety of drugs having the capacity to alter central nervous system (CNS) excitability. The present study examines the effect of smoking 1 g of marihuana containing 1.5 per cent (-) -delta^9-transtetrahydrocannabinol (THC) on the CFF threshold. Results of this study indicate that marihuana enhances the CFF threshold, unlike other drugs classified as CNS "depressants." The increased excitability of the visual system following marihuana smoking is discussed with reference to previous reports of "perceptual sharpening."

SCOTT, J.P. Effects of psychotropic drugs on separation distress in dogs. Presented at the 9th Congress Collegium Internationale Neuropsychopharmacologicum, Paris, France, July 11, 1974.

Separation distress can be reliably elecited in young dogs 3-8 weeks of age by removal to an unfamiliar environment and /or separation from mother and littermates. It is expressed as discrete vocalizations that are easily counted and show rates up to 120 per min. or more. It is therefore a readily induced emotional state that lends itself to modification by and testing of psychotropic drugs. In general , tranquilizers (chlorpromazine, meprobamate, valium, reserpine) have little effect at doses producing marked physiological side effects. Ethanol likewise has little effect. Sodium pentobarbital has irregular effects, and only at doses that produce muscular incoordination. Among anti-depressants, d-amphetamine sulfate increases vocalization rates expressed at intermediate levels. Imipramine completely suppresses vocalization without side effects, but only in beagles and certain beagle hybrids. In summary, this important emotional reaction is resistant to effects of most psychotropic drugs. Genetic differences appear to be very important and point the way to futher detailed biochemical research.

SCOTT, J.P., LEE, C-T., and HO, J.E. Effects of fighting, genotype, and amphetamine sulfate on body temperature of mice. Journal of Comparative and Physiological Psychology 76(3): 349-352 (1971)

These experiments demonstrate complex interaction between behavior genotype, drug effects, and internal physiological reactions. Fighting significantly elevates body temperature in male mice of both the C57BL/6 and BALB/c inbred strains, and may contribute to the increased toxicity of amphetamine sulfate in grouped mice. This drug has widely different effects on the two genotypes, lowering temperatures in C57s at all levels tested, but raising it in BALBs at 10mg/kg and above. At 10 mg/kg fighting is inhibited in C57s but not in BALBs, except when elevated temperatures reach lethal levels.

SEEGAL, R.F. and ISAAC, W. Sensory influences upon amphetamine tolerance. Physiology and Behavior 7: 877-879 (1971)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

SEEVERS, M.H. A euphoria-dysphoria homeostasis hypothesis as a basis for drug seeking behavior. Committee on Problems of Drug Dependence. Washington, D.C.: National Academy of Sciences, National Research Council, 1967. P. 5079.

SEGAL, D.S. and MANDELL, A.J. Differential behavioral effects of hypothalamic polypeptides. The Thyroid Axis, Drugs, and Behavior. Edited by A. J. Prange, Jr. New York: Raven Press, 1974.

Intraventricular infusions of thyrotropin releasing hormone (TRH) and of somatotropin release-inhibiting factor (SRIF)were found to have differential effects on the behavior of freely moving rats. TRH increased spontaneous motor activity, whereas comparable doses of SRIF suppressed activity. This differentiation suggests specific physiological roles for these hypothalamic polypeptides in the regulation of behavior and their potential effectiveness in the treatment of disorders of mood.

SEGAL, D.S. and MANDELL, A.J. Long-term administration of d-amphetamine: Progressive augmentation of motor activity and stereotypy. Pharmacology Biochemistry and Behavior 2: 249-255 (1974)

The competitive relationship between d-amphetamine induced stereotypy and locomotor activity indicates the importance of their concurrent evaluation, especially during chronic studies. Repeated injection 0.5, 1.0, 2.5, 5.0, or 7.5 mg/kg d-amphetamine for 36 successive days, in rats continuously exposed to the experimental chambers, produced a progressive augmentation in stereotypy and/or locomotion (depending on dose) during the 3-4 hr. interval following injections (post-injections phase). In contrast, dark phase locomotor activity (8-20 hr. after each daily injection) was maximally reduced (30-40% of controls) after the first injection of either 5.0 or 7.5 mg/kg d-amphetamine and gradually declined to this level with repeated injection of 1.0 and 2.5 mg/kg. Carry-over of both the post-injection augmentation and dark phase reduction of locomotion was revealed during amphetamine retest 8 days following discontinuation of daily d-amphetamine injections. Possible mechanisms underlying these behavioran alterations are discussed.

SETHY, V.H. and WINTER, J.C. Effects of yohimbine and mescaline on punished behavior in the rat. Psychopharmacologia 23: 160-166 (1972)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

SHAGASS, C. Effects of LSD on somatosensory and visual evoked responses and on the EEG in man. Recent Advances in Biological Psychiatry 9: 209 (1967)

SHAGASS, C. Invited discussion of Drs. M. Fink and T. Itil's paper: Evoked response and behavioral effects of LSD and ditran. Pharmacology: A Review of Progress, 1957 -1967. Edited by D. H. Efron. Washington, D. C.: PHS Publication No. 1836, 1969.

SHARKAWI, M. and GOLDSTEIN, A. Antagonism by physostigmine of the "running fit" caused by levorphanol, a morphine congener, in mice. British Journal of Pharmacology 37(1): 123-128 (September, 1969)

1. Drugs of the morphine type cause a stereotyped "running fit" in the mouse.
2. The intensity and duration of this response are related to the dose.
3. Measurement of this phenomenon serves as a good method for the quantitative comparison of drugs of this type and for the study of their antagonists.
4. Intracerebral injection of physostigmine antagonized the "running fit" induced by a wide range of doses of levorphanol.
5. The results are consistent with the hypothesis that drugs of the morphine type act by retarding the release of acetylcholine at some central cholinergic synapses.

SHARMA, S. and MOSKOWITZ, H. Effect of marihuana on the visual autokinetic phenomenon. Perceptual and Motor Skills 35: 891-894 (1972)

The effects of 4 dose levels of marihuana upon the visual autokinetic phenomenon were examined in 12 Ss. The amount of apparent movement was greatly increased under the two highest doses. Possible hazards associated with vehicle operation at night under marihuana are noted.

SHARMA, S. and MOSKOWITZ, H. Effects of two levels of attention demand on vigilance performance under marihuana. Perceptual and Motor Skills 38: 967-970 (1974)

12 Ss under marihuana performed a modified version of the Mackworth clock-vigilance task with two levels of attention and response demands. Similar continuous declines in signal detections over time were found for both experimental conditions indicating that the vigilance decrements induced by marihuana (200 mcg./Kg.B.W.) are unrelated to arousal level.

SHARPE, L.G., GARNETT, J.E. and CICERO, T.J. Analgesia and hyperreactivity produced by intracranial microinjections of morphine into the periaqueductal gray matter of the rat. Behavioral Biology 11(3): 303-313 (1974)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

SHEARD, M.H. Aggressive behavior: Modification by amphetamine, p-chlorophenylalanine and lithium in rats. Agressologie 14(5): 323 (1973)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

SHEARD, M.H. The effect of p-chlorophenylalanine on behavior in rats: Relation to brain serotonin and 5-hydroxyindoleactic acid. Brain Research 15: 524-528 (1969)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

SHEPPARD, C., FIORENTINO, D., COLLINS, L. and MERLIS, S. Performance errors on Ravens Progressive Matrices (1938) by sociopathic and schizotypic personality types. Psychological Reports 23: 1043-1046 (1968)

For abstract, see Section I. Methodology of Drug Research.

SHUSTER, L., WEBSTER, G.W. and YU, G. Increased running response to morphine in morphine pretreated mice. The Journal of Pharmacology and Experimental Therapeutics (in press)

SHUSTER, L., WEBSTER, G.W. and YU, G. Perinatal narcotic addiction in mice: Sensitization to morphine stimulation. International Journal of Addictive Diseases (in press)

SMITH, S.G. and DAVIS, W.M. Behavioral control by stimuli associated with acquisition of morphine self-administration. Behavioral Biology 9(6): 777-780 (December, 1973)

Seven rats were allowed to acquire self-administration behavior which was then extinguished. Two stimuli previously associated with self-administration, a buzzer and presence of drug in the organism, were tested for their effects upon conditioned drug-taking behavior. In tests of each stimulus separately, there was a gradual decline of behavioral control. However, when tested in combination they maintained behavior even if the conditioned reinforcing property of the buzzer had previously been extinguished. The significance of the results to behavioral control as it relates to the applied problem of eliminating conditioned drug-taking behavior was discussed.

SMITH, S. G. and DAVIS, W. M. Haloperidol effects on morphine self-administration: Testing for pharmacological modification of the primary reinforcement mechanism. The Psychological Record 23: 215-221 (1973)

For abstract, see Section I. Methodology of Drug Research.

SMITH, S. G. and DAVIS, W. M. Interrelationships of exteroceptive and interoceptive stimuli associated with morphine self-administration: Significance to elimination of drug-seeking behavior. Clinical Toxicology 7: 264-265 (1974)

Rats were implanted with indwelling jugular catheters and allowed to self-administer low doses (32 mu-g/kg) of morphine sulfate (MS) intravenously. Following acquisition of the operant behavior, a study was conducted concerning the behavioral control exerted on the drug-seeking response by interoceptive stimuli (drug sensations) previously experienced, and by an exteroceptive stimulus, a conditioned reinforcer established during MS self-administration. The results indicated that: (1) extinction of lever-pressing in the absence of both contingent MS and the conditioned reinforcer to backchain and abolish interoceptive or exteroceptive stimulus control over drug-seeking behavior; (2) control of drug-seeking behavior by a conditioned reinforcer associated with MS was very resistant to extinction in comparison to extinction of conditioned reinforcers associated with traditional primary reinforcers (i.e., food or water) under similar acquisitional situations; (3) the behavioral control previously exerted by a conditioned reinforcer which subsequently was extinguished could be re-established by mere association with drug sensations experienced without response contingency (i.e., subcutaneous injection of MS); (4) if the behavioral control of both the exteroceptive and interoceptive stimuli was extinguished individually before combined testing, drug-seeking behavior also was abolished.

A second study assessed the effects of response-contingent shocks on MS self-administration behavior. Results that response-contingent shock suppressed self-administration of MS. The significance of the results in both studies was evaluated relative to behavior control mechanisms and to the use of extinction or punishment technics to abolish MS self-administration behavior.

SMITH, S. G. and DAVIS, W. M. Punishment of amphetamine and morphine self-administration behavior. The Psychological Record 24: 477-480 (1974)

The effects of punishment on self-administration of morphine and amphetamine were examined. The date indicate that response-contingent shock is effective in suppressing lever-pressing for both abuse agents. The results are discussed in terms of a possible method for suppressing drug-seeking behavior in nondependent organisms.

SNYDER, E. W., LEWIS, E. G., BECK, E. C. and DUSTMAN, R. E. Lack of behavioral tolerance to delta-9-tetrahydrocannabinol in stumptailed macaques. Proceedings of the 81st Annual Convention of the American Psychological Association, 1973.

SNYDER, S. H. Stereoselective features of catecholamine disposition and their behavioral implications. Journal of Psychiatric Research 11: 1-10 (1974)

SNYDER, S.H., TAYLOR, K.M., COYLE, J.T. and MEYERHOFF, J.L. The role of brain dopamine in behavioral regulation and the actions of psychotropic drugs. American Journal of Psychiatry 127(2): 199-207 (August, 1970)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

SOFIA, R.D. and BARRY, H., III. The influence of SKF 525 on the analgesic actions of delta-1-tetrahydrocannabinol. Federation Proceedings 31(2): 506 (March-April, 1972)

The influence of SKF 525 on the analgesic actions of delta-1-tetrahydrocannabinol (THC) in mice and rats was investigated. Analgesia was tested by increase in response latency to a painful stimulus, in mice with the hote plate and tail flick methods and in rats with the tail flick, at 0.5 hour after injection of delta-1-thc (5 to 40 mg/kg I.P.) and morphine (1.25 to 10 mg/kg S.C.). In mice, delta-1-THC was approximately one-half to one-third as potent as morphine tested with both methods. In rats, delta-1-THC was only one-eighth as potent as morphine, suggesting a species difference for the 7-hydroxy metabolite of delta-1-THC is largely responsible for the behavioral effects of this drug, pretreatment with SKF 525-A (25 mg/kg, I.P.), a nonspecific inhibitor of liver microsomal enzymes responsible for drug metabolism, enhanced the analgesic activity of delta-1-THC tested in mice with both methods and in rats with the tail flick. Analgesic effect of delta-1-THC (20 mg/kg), tested with the hot plate in mice at intervals of 0.25 to 24 hours, was maximal 0.25 to 1 hour and disappeared between 4 and 8 hours. Pretreatment with SKF 525-A enhanced and prolonged the analgesic action of delta-1-THC, with peak effect at 1 hour and substantial analgesia persisting at 8 hours. The analgesic activity of delta-1-THC may be due primarily to the parent compound.

SOKOL, G.H. and MAICKEL, R.P. Toxic interactions of d-amphetamine and tricyclic antidepressants in mice. Research Communications in Chemical Pathology and Pharmacology 3(3): 513 (May, 1972)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

SOSKIN, W. Children of the Good Life. A Second Interim Report of Project Community, Berkeley, California, March, 1972.

SOULE, A.B., STANDLEY, K., COPANS, S.A. and DAVIS, M. Clinical uses of the Brazelton-neonatal scale. Pediatrics 54(5): 583-586 (November, 1974)

The clinical usefulness of the Brazelton Neonatal Assessment Scale was explored in examination of infants born to heroin-addicted mothers taking methadone. Scale scores differentiated these babies in drug withdrawal from data of a normal sample and provided important information on courses of illness. Systematic observation of newborn behaviors can be a significant adjunct in diagnosis and management.

SPARBER, S.B. Neurochemical changes associated with schedule-controlled behavior. Federation Proceedings (in press)

SPARBER, S.B. and PETERSON, D.W. Operant behavioural demonstration of qualitative differences between the d- and l-isomers of amphetamine. Frontiers in Catecholamine Research. New York: Pergamon Press, 1973.

SPAULDING, T.C. and DEWEY, W.L. The effect of phenitrone, a reported hashish antagonist, on the overt behavior of cats. Research Communications in Chemical Pathology and Pharmacology 7(2): 347-352 (February, 1974)

The compound phenitrone 3-(hexahydro-1H-YL)-nitropropiophenone HCl which has been reported to be a hashish antagonist exhibited interesting pharmacological and behavioral effects in mice, rats, and especially dogs. Cats which received phenitrone 10-80 mgs/kg. I.P. exhibited an alteration of their ongoing steady state pattern of behavior. At doses from 20-80 mgs/kg the cats showed a marked increase in vocalization and excitement and a notable disruption of autonomic and somatomotor functions. The purported hashish antagonist, phenitrone, exhibited interesting behavioral effects in cats which resembled behavior induced by several known psychotropic drugs such as mescaline and chlorpromazine in this species.

SPAULDING, T.C., FORD, R.D., DEWEY, W.L., McMILLAN, D.E. and HARRIS, L.S. Some pharmacological effects of phenitrone and its interaction with delta-9-THC. European Journal of Pharmacology 19: 310-317 (1972)

For abstract, see Section II. Drug Chemistry and Metabolism.

STEINERT, H.R., HOLTZMAN, S.G. and JEWETT, R.E. Some agonistic actions of the morphine antagonist levallorphan on behavior and brain monoamines in the rat. Psychopharmacologia 31: 35-48 (1973)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

STITZER, M. Comparison of morphine and chlorpromazine effects on moderately and severely suppressed punished responding in the pigeon. The Journal of Pharmacology and Experimental Therapeutics 191(1): 172-178 (1974)

Key-peek responding of pigeons was maintained under a fixed-interval 3-minute schedule of food delivery. Simultaneously, electric shock was delivered under a fixed-ratio schedule for responses occurring during alternate schedule components. Shock intensity and frequency were adjusted to produce either moderate or severe response suppression in the punishment components. Chlorpromazine, under both levels of punishment severity, further decreased most rates of punished responding, while generally increasing comparable rates of unpunished responding. Very low rates which occurred at the beginning of the punishment components were increased by drug, but to a lesser extent than comparable low rates of unpunished responding. The effects of morphine depended on shock severity. When punished responding was moderately suppressed (50-74%) with respect to unpunished responding, morphine increased comparable low rates in the two schedule components to

Stitzer, M. continued
the same extent. When punished responding was more severely suppressed, morphine further decreased very low rates of punished responding, but generally increased comparable rates of unpunished responding. The effect of both drugs on local rates within the intervals depended in an orderly way on control response rate.

STRAIGHT, R., WAYNE, A.W., LEWIS, E.G. and BECK, E.C. Marihuana extraction and purification for oral administration of known amounts of delta-9-tetrahydrocannabinol (THC). Biochemical Medicine 8 (3): 341-344 (December, 1973)

We have developed a simple method for the extraction, purification, estimation, and oral administration of delta-9-THC from a standardized batch of cannabis plant material for physiological and psychological studies of the effect of marihuana on man and primates. The technique of oral administration is applicable also to synthetic delta-9-THC recently made available by the National Institute of Mental Health.

Student Association for the Study of Hallucinogens, Inc. CNS depressants. A STASH literature review. Grassroots (November, 1974 supplement)

Student Association for the Study of Hallucinogens, Inc. STASH fact sheet on cocaine. Grassroots (February, 1972 supplement)

Student Association for the Study of Hallucinogens, Inc. STASH fact sheet on DOM ("STP"). Grassroots (July, 1972 supplement)

Student Association for the Study of Hallucinogens, Inc. STASH fact sheet on psilocybin. Grassroots (August, 1972 supplement)

SULLIVAN, R. and FREEMARK, N. Judgment of minimal aversion thresholds and tolerance levels in two modalities. Psychonomic Science 15: 107-108 (1969)

Eight males and four females judged a minimal aversion threshold (MAT) and a tolerance level for white noise and electric shock stimuli. Cross model rank correlations of both judgments were found to be significant. Significant sex and practice differences were found for electric shock judgments but not for white noise judgments.

TAKEMORI, A.E., PICKENS, R. and PLUNKETT, C.R. Substitution of GPA-1657 and GPA-1658 for morphine in drug self-administration by rats. Federation Proceedings 27(2): 754 (March, 1968)

Recently it had been reported that GPA 1657 had a more potent analgesic activity than morphine in rats and mice while GPA 1658 exhibited relatively little activity. It also appeared in single dose suppression studies that GPA 1658 suppressed abstinence syndrome in morphine-dependent monkeys while GPA 1658 did not. The present study determined the effect of substitution of these isomers on the self-administration of morphine. Rats were first made physically dependent on morphine by parenteral injections beginning with 10 and increasing to either 50 or 100 mg/kg t.i.d. over a 4-5 day period, and then equipped with a jugular catheter and given the opportunity to self-administer the drug at 10 mg/kg/infusion. When daily morphine intake had stabilized, various doses of either GPA 1657 or 1658 were substituted for morphine. Self-administration was maintained by the analgesically inactive GPA 1658 but not by the active GPA 1657. The frequency of self-administration of GPA 1658 resembled that of morphine, and GPA 1657 produced a typical extinction-like pattern of responding.

TAKEMORI, A.E., STESIN, A.J. and TULUNAY, F.C. A single-dose suppression test in morphine-dependent mice. Proceedings of the Society for Experimental Biology and Medicine 145: 1232-1235 (1974)

For abstract, see Section I. Methodology of Drug Research.

TART, C.T. On Being Stoned: A Psychological Study of Marijuana Intoxication. Palo Alto, California: Science and Behavior Books, 1971.

TAYLOR, K.M. and SNYDER, S.H. Amphetamine: Differentiation by d and l isomers of behavior involving brain norepinephrine or dopamine. Science 168: 1487-1489 (June, 1970)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

TAYLOR, W.A. and SULSER, F. Effects of intraventricularly administered l- d- and dl-p-hydroxyamphetamine (POH) on behavior and cerebral catecholamines. Presented at the Fifth International Congress on Pharmacology, San Francisco, California, 1972.

TESSEL, R.E. and WOODS, J.H. Structural relationship between meta-substituted n-ethyl amphetamines and self-administration in rhesus monkeys. The Pharmacologist 16: 215 (1974)

Doses of N-ethyl amphetamine (NEA) and its meta-fluoro (FEA), meta-bromo (BEA), meta-iodo (IEA) and meta-methyl (MEA) derivatives were substituted for response-contingent intravenous injections of cocaine to determine the ability of these compounds to reinforce fixed-ratio-30 responding in rhesus monkeys. All compounds except IEA maintained stable responding at rates higher than saline when each dose was available for at least 14 sessions. With NEA and FEA (0.01-0.10 mg/kg/injection), the maximum rates occurred at 0.03 mg/kg injection; with BEA and MEA (0.30-0.30 mg/kg/injection), maximum rates occurred at 0.10 mg/kg/injection. IEA (0.01-0.30 mg/kg/injection) failed to reinforce responding even though in other monkeys it had a potency comparable to that of a self-administered drug, BEA, and a rapid onset of behavioral action in suppressing fixed-ratio-30 food-reinforced responding. Since substituent size is primarily responsible for variations in the efficacy of drugs in this series in other systems (e.g., Pharmacologist 15: 140, 1973), the present data together with other findings indicate that substituent size influences the extent to which these compounds can function as reinforcers.

THOMPSON, T. and PICKENS, R. Drugs as reinforcers: Schedule considerations. Proceedings of Symposium on Schedule-Induced and Dependent Phenomena, Toronto, Canada (in press)

THOMPSON, T. and PICKENS, R. Interoceptive stimulus control of behavior. Chapter 1 of Stimulus Properties of Drugs. Edited by T. Thompson and R. Pickens. New York: Appleton-Century-Crofts, 1971. P. 3.

THOMPSON, T. and PICKENS, R. Stimulant self-administration by animals; Some comparisons with opiate self-administration. Federation Proceedings 29(1): 6-12 (January-February, 1970)

THOMPSON, T. and SCHUSTER, C.R. Behavioral Pharmacology. Englewood, New Jersey: Prentice-Hall, 1968.

This book is concerned only with observable behavioral changes in the field of behavioral pharmacology. The main scope of the book deals with principles and techniques of experimental psychology and principles of pharmacology as they apply to behavioral pharmacology.

THOR, D. H. Amphetamine induced fighting during morphine withdrawal. The Journal of General Psychology 84: 245-250 (1971)

Male hooded rats received ad lib d-amphetamine sulfate in concentrations of 50 or 200 mcg/ml in their drinking water for 10 days after withdrawal from morphine (100 mg/kg/day). Lethal and near-lethal fighting occurred among Ss consuming the greater amphetamine concentration. Less intense, ritualistic fighting occurred among Ss consuming the lesser amphetamine concentration. A control group under withdrawal from the same morphine regimen also exhibited nontraumatic fighting. Amphetamine appears to be an effective pharmacological stimulus to violent fighting during a broad segment of the withdrawal syndrome.

THOR, D.H. and HOATS, D.L. Morphine-amphetamine-induced fighting and interim socialization. Psychonomic Science 20(3): 156-158 (1970)

Traumatic and lethal fighting among male rats can be induced by a single moderate dose of amphetamine given during withdrawal from morphine. Socialization with other rats during the interval between terminal morphine and amphetamine modifies the course of subsequent aggressive behavior. Fighting is prolonged for rats maintained in isolation during the interdrug interval.

THOR, D.H., HOATS, D.L. and THOR, C. J. Morphine induced fighting and prior social experience. Psychonomic Science 18(3): 137-139 (1970)

Six groups of normally docile laboratory rats received morphine injections (to 600 mg/kg/day), placebo injections, or no injections under social or isolated conditions for 6 days. Postwithdrawal intragroup fighting was then monitored for 168 h by automated recording of loud vocalizations. Morphine-treated groups spontaneously began sustained (30h) fighting 3 days after terminal injections, with greatest fighting observed in the group receiving the drug under social conditions.

TILSON, H.A., RECH, R.H. and SPARBER, S.B. Release of ^{14}C-norepinephrine into the lateral cerebroventricle of rats exposed to a conditioned aversive stimulus. Pharmacology Biochemistry and Behavior (in press)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

TINKLENBERG, J.R. Study group (ad hoc): Cannabis study group on marihuana and alcohol. Psychopharmacology Bulletin 8(1): 9-10 (1972)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

TINKLENBERG, J.R., KOPELL, B.S., MELGES, F.T. and HOLLISTER, L.E. Marihuana and alcohol. Time production and memory functions. Archives of General Psychiatry 27: 812-815 (December, 1972)

In a double-blind study, time production tasks and clinical tests of memory function were performed by 15 normal subjects given placebo and "social" doses of alcohol (ethyl alcohol) and marihuana, calibrated to (-)-delta-1-tetrahydrocannabinol. Using subjects as their own controls, it was found that, compared to alcohol and placebo, marihuana induced a significant under production of time intervals suggesting an acceleration of the internal clock. At these dose levels, there were no significant changes in memory function, but during marihuana intoxication some consistent trends toward greater impairment of tracking information over time were noted.

TINKLENBERG, J.R., MELGES, F.T. and HOLLISTER, L.E. Marihuana and memory. Psychopharmacology Bulletin 7(4): 20 (1971)

These findings suggest that mh. can impair performance on some tasks which require memory function, particularly if those tasks are complex. Tasks which require rote memory function are less vulnerable to effects.

TINKLENBERG, J.R., MELGES, F.T., HOLLISTER, L.E. and GILLESPIE, H.K. Marijuana and immediate memory. Nature 226: 1171-1172 (June, 1970)

TOLOSA, E.S. and SPARBER, S.B. Apomorphine in Huntington's Chorea: Clinical observations and theoretical considerations. Life Sciences 15: 1371 (1974)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

TROST, J.G. and FERRARO, D.P. Discrimination and generalization of drug stimuli in monkeys. Drug Addiction: Neurobiology and Influences on Behavior, Vol. 3. Edited by J.M. Singh and H. Lal. New York: Stratton Intercontinental Book Company, 1974.

TRUITT, E.B., JR. A behavioral comparison between alcohol and THC. Proceedings of the American Association for the Advancement of Science Meeting, Chicago, Illinois, December 19, 1970.

TRUITT, E.B., JR. and ANDERSON, S.M. The role of biogenic amines in the central actions of tetrahydrocannabinols and their metabolites. Acta Pharmaceutica Suecica 8: 696-697 (1971)

For abstract, see Section II. Drug Chemistry and Metabolism.

TSENG, L.F., LOH, H.H., HO, I.K. and WAY, E.L. The role of brain catecholamines in naloxone-induced withdrawals in morphine-dependent rats. Proceedings of the Western Pharmacological Society 17: 178-183 (1974)

TSENG, L.F., WEI, E. and LOH, H.H. Brain areas associated with bulbacapnine catalepsy. European Journal of Pharmacology 22: 363-366 (1973)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

UEHLING, B.S. Effects of chronic d-amphetamine sulfate administration during development in rats. International Journal of Neuropharmacology 8: 43-48 (1969)

The present investigation was concerned with the effects of long-term administration of d-amphetamine in the daily drinking water of rats on weight and three behavioral tasks. No tolerance to the drug was found for weight measures, nor in the behavioral measures of level pressing for illumination change or gross activity. Drug animals were significantly lighter than non-drug animals, pressed more for illumination change, and were more active. No difference was found between performance of drug and non-drug animals in an avoidance conditioning task. It may be that tolerance to the drug does not appear when measured by situations not employing strong motivational conditions (e.g. pressing for illumination change and activity), but where such conditions are employed (e.g. shock), tolerance as reflected in the lack of difference between drug and non-drug groups does appear.

UYENO, E.T. Alteration of rat behavior produced by 2, 5-dimethoxy-4-methylamphetamine. Proceedings of the Western Pharmacological Society 15: 108-109 (1972)

UYENO, E.T. Delta-9-tetrahydrocannabinol administration during pregnancy of the rat. Proceedings of the Western Pharmacological Society 16: 64-67 (1973)

UYENO, E.T. Delta-9-tetrahydrocannabinol and the competitive behavior of the rat. Federation Proceedings 33(3): 540 (March, 1974)

The time of peak effect study conducted at 1.5, 2, and 2.5 hrs. after an intraperitoneal injection of 0.5 mg/kg of delta-9-tetrahydrocannabinol (delta-9-THC) showed that the compound inhibited the dominance behavior of male Wistar rats in competition for a female in estrus. The groups of matched pairs, tested 2 hrs. after the treatment had the highest percentage of submissive experimental animals; therefore, the peak time was considered to be 2 hrs. after the injection. A dose-response experiment conducted at the time of peak effect indicated that 0.25, 0.5, and 1 mg/kg of delta-9-THC inhibited the sexual dominance behavior in a dose-dependent manner. The median effective dose (ED_{50}) is defined as an estimated dose by which 50% of the treated animals are expected to be submissive. The ED_{50} and 95% confidence limits calculated according to the profit method of Litchfield and Wilcoxon are 1.76 micromoles/kg and (0.70 - 4.40 micromoles/kg). A statistical analysis indicates that delta-9-THC is significantly less potent than lysergic acid diethylamide (ED_{50} = 0.08 micromole/kg; Uyeno: Intern. J. Neuropsychiatry, 188-190, 1967) in the inhibition of sexual dominance behavior. The present finding is consistent with that of Uyeno (Fed. Proc. 32:725, 1973) who found that delta-9-THC inhibited the dominance behavior of rats in competition for a food pellet.

UYENO, E.T. Disruption of maze performance by delta-9-tetrahydrocannabinol. Proceedings of the 81st Annual Convention of the American Psychiatric Association, 1973.

UYENO, E.T. Disruption of retrieving behavior of the rat by LSD. Proceedings of the 80th Annual Convention of the American Psychiatric Association, 1972.

UYENO, E.T. Effects of delta-9-tetrahydrocannabinol in the viability and behavioral development of the rat. Committee on Problems of Drug Dependence. Washington, D.C.: National Academy of Sciences, National Academy of Engineering, National Research Council, 1973. Pp. 167-177.

UYENO, E.T. Effects of delta-9-tetrahydrocannabinol on the dominance behavior of the rat. Federation Proceedings 32(3): 725 (March, 1973)

The time of peak effect experiment conducted 1, 1.5, and 2 hrs. after a single intraperitoneal administration of 0.5 mg/kg of delta-9-tetrahydrocannabinol (delta-9-THC) showed that the compound inhibited the dominance behavior of male Wistar rats in a food competition situation. The group tested 1.5 hrs. after the injection had the highest percentage of submissive experimental animals; therefore, the time of peak effect was considered to be 1.5 hrs. post injection. The peak time of delta-9-THC was much later than that (0.25 hr.) of 0.008 mg/kg of lysergic acid diethylamide (LSD-25), obtained in our previous study (Int. J. Neuropharmacol. 5, 317, 1966). A dose-response study conducted at the time of peak effect showed that 0.25, 0.5, and 1 mg/kg of delta-9-delta-THC inhibited considerably the dominance behavior in a dose-related manner. The median effective dose (ED_{50}) estimated from the dose-response curve is 1.9 micromoles/kg; and the 95% confidence limits, computed according to the graphic profit method are 0.99 and 3.65 micromoles/kg. An analysis of potency ratio showed that delta-9-THC was significantly less potent than LSD-25 (ED_{50} = 0.03 micromole /kg) in inhibiting the dominance behavior. The present finding is consistent with that of Hollister et al (Clin. Pharm. Therap. 9, 783, 1968) who reported that delta-9-THC tended to reduce aggression in man.

UYENO, E.T. Effects of lysergic acid diethylamide on the maternal behavior of the rat. The Journal of Psychology 75: 271-273 (1970)

UYENO, E.T. Effects of prenatally administered lysergic acid diethylamide on the viability and behavioral development of rat offspring. Committee on Problems of Drug Dependence. Washington, D. C.: National Academy of Sciences, National Research Council, 1970. Pp. 6550-6554.

UYENO, E.T. Effects of 2, 5-dimethoxy-4-methylamphetamine on the behavior of rats in competition for food. Committee on Problems of Drug Dependence. Washington, D.C.: National Academy of Sciences, National Academy of Engineering, National Research Council, 1972.

UYENO, E.T. Enhancement of swimming performance with delta-9-tetrahydrocannabinol. Presented at the 13th Annual Meeting of The Psychonomic Society, St. Louis, Missouri, November 2-4, 1972.

According to their swimming times (i.e., duration of swim), 22 Wistar male rats were matched and assigned to experimental and control groups. The experimental animals were injected intraperitoneally with 2 mg/kg of delta-9-tetrahydrocannabinol dissolved in dehydrated alcohol, whereas the control animals were given the vehicle. The results of the postdrug swim test showed that the mean swimming time of the experimental group was significantly longer than that of the control group.

UYENO, E.T. Influence of drugs on the aggressive and dominant behavior of the rat. Presented at the NATO International Conference, Monte Carlo, Monaco, July 1-6, 1973.

The present results, indicating that delta-9-THC inhibits aggressive and dominant behavior are consistent with those of Santos, Sampaio, Fernandes, and Carlini (1966), of Kilbey, Fritchie, McLendon, and Johnson (1972), and of McIsaac, Fritchie, Indanpaan-Heikkila, Ho, and Englebert (1971). Other studies have have shown that delta-9-THC disrupts the retention performance of rats tested in an underwater swim maze (Uyeno, 1973) and distorts the time perception of human subjects (Hollister, Richards, & Gillespie, 1969). Despite the disrupting side effects, delta-9-THC and other psychotropic compounds can be used as effective research tools to study the physiological and chemical determinants of aggressive behavior. Moreover, interdisciplinary research involving development and pharmacological approaches will probably lead to better understanding of the determinants and origins of aggressive behavior.

UYENO, E.T. Lysergic acid diethylamide, chlorpromazine and maze performance. Archives internationales de Pharmacodynamie et de Therapie 184(2): 389-394 (April, 1970)

For abstract, see Section I. Methodology of Drug Research.

UYENO, E.T. Lysergic acid diethylamide and a novel stimulus. Psychonomic Science 18(1): 52 (1970)

The mean running time of rats injected with 0.016 mg/kg of lysergic acid diethylamide (LSD-25) was not significantly different from that of others, administered saline solution. However, when a novel stimulus (hurdle) was presented in the runway, the mean running time of the experimental group was significantly longer than that of the control group.

VACHON, L. and SULKOWSKI, A. Attention, learning and speed in psychomotor performance after marihuana smoking. Proceedings from National Conference on Marihuana (in press)

We conclude from these results that since attention, memory and psychomotor speed are not affected by marihuana, the central processing of relevant stored information is more difficult after administration of this drug.

VACHON, L., SULKOWSKI, A. and RICH, E. Marihuana effects on learning, attention and time estimation. Psychopharmacologia 39: 1-11 (1974)

Ten young, healthy male volunteers smoked a marihuana cigarette with 2.5% delta-9-THC and a THC-exhausted placebo cigarette. The marihuana administration was associated with an increase in heart rate, elevation of systolic blood pressure, conjunctival reddening and specific airway conductance increase; time perception and Automated Digit Symbol Substitution Test performance were impaired. Diastolic blood pressure and attention measured by the Continuous Performance Task were not affected.

The placebo preparation produced a subjective pleasant "high" but no physiologic effects nor performance change. The "high" induced by the active preparation was often rated as unpleasant.

VAILLANT, G.E. Clinical significance of anticholinergic effects of imipramine-like drugs. American Journal of Psychiatry 125: 154-156 (1969)

VAILLANT, G.E. A comparison of antagonists of physostigmine-induced suppression of behavior. The Journal of Pharmacology and Experimental Therapeutics 157 (3): 636-648 (1967)

Experiments were designed to assess the effects of a variety of drugs in antagonizing the suppression of operant behavior by physostigmine. The experimental preparations were pigeons and monkeys pretreated both with physostigmine and with methylatropine; the latter drug was given to block peripheral effects of physostigmine. The operant behavior was maintained on fixed interval and fixed ratio schedules by food reinforcement or shock termination. Previous observations that physostigmine exerted a very nonspecific suppressant effect upon operant behavior were confirmed; the observed effects seemed mediated by a muscarine-like effect of physostigmine on the central nervous system. Physostigmine-induced suppression of behavior was not differentially affected by type of schedule or by type of reinforcer. Scopolamine, atropine, trihexyphenidyl, benztropine, diphenhydramine and imipramine antagonized physostigmine-induced suppression at dose levels comparable to those known to antagonize acetylcholine in the periphery and those producing sedative effects in humans. Chlorpromazine, dihydro-beta-erythroidine, mecamylamine and amphetamine proved ineffective in reversing physostigmine-induced suppression of behavior.

VILLARREAL, J.E. The effects of morphine agonists on morphine-dependent rehesus monkeys. Agonist and Antagonist Actions of Narcotic Analgesic Drugs. Edited by H.W. Kosterlitz, H.O.J. Collier and J.E. Villarreal. Baltimore, Maryland: Baltimore University Park Press, 1973. Pp 73-93.

VOLAVKA, J., CROWN, P., DORNBUSH, R., FELDSTEIN, S. and FINK, M. EEG, heart rate and mood change ("high") after cannabis. Psychopharmacologia 32: 11-25 (1973)

Fourteen experienced marijuana users smoked marijuana, hashish, delta-9-THC, and placebo. EEG, ECG and ratings of subjective feelings of "high" and pleasantness were recorded. EEGs were processed by period analysis.

In EEG, marijuana and delta-9-THC increased the amount of alpha activity, and the three Cannabis preparations decreased the amount of beta activity. The average frequency of alpha activity was decreased by 0.15--0.20 c/sec after marijuana, hashish and delta-9-THC. The peak EEG effect occurred during the first 10 min after smoking; most of the changes disappeared after 40 min. Heart rate was increased by all the three drugs, and the effect persisted for the entire observation period (50 min).

Feelings of "high" were elicited by each Cannabis preparation. This was not true of the pleasantness of the experience: only marijuana and hashish were perceived as more pleasant than placebo. Intensity of "high" increased with the amount of alpha activity, and decreased with the average alpha frequency. Pleasantness was unrelated to the EEG.

The "high" showed a linear increase with heart rate, whereas pleasantness of the experience was an inverted U-function of heart rate.

VOLAVKA, J., DORNBUSH, R., FELDSTEIN, S., CLARE, G., ZAKS, A., FINK, M. and FREEDMAN, A.M. Marijuana, EEG, and behavior. Annals of the New York Academy of Sciences 191: 206-215 (December, 1971)

Data from two experiments are presented. The first (chronic) experiment showed that marijuana induced dysphoria and EEG synchronization when smoked daily by four heroin postaddicts for 10-22 days.

The second (acute) experiment employed 10 student volunteers. A placebo and two dose levels (7.5 and 22.5 mg THC) of marijuana were used. An EEG effect of rapid onset and short duration was detected by computer analysis. The principal changes were an increase in percent time alpha and an associated reduction in theta and beta bands. The performance on short-term memory and reaction time tasks was impaired. Heart rate was increased. These physiological and behavioral responses were dose-related.

In future studies, EEG and behavioral tasks should be administered as soon after smoking as possible and smoking time should be reduced. A continuous alerting task should be used for EEG studies of marijuana. The time course of the EEG and behavioral changes produced by the smoking of marijuana should be further investigated.

VOLAVKA, J., DORNBUSH, R., FELDSTEIN, S., and FINK, M. Effects of delta-9-tetrahydrocannabinol on EEG, heart rate, and mood. Electroencephalography and Clinical Neurophysiology 33: 453 (1972).

Ten experienced marijuana users smoked placebo, 10, or 20 mg of THC-delta-9, EEG, EKG and a rating scale for the subjective feeling of "high" were used. EEGs were processed by period analysis.

THC elicited a short-lived increase in alpha amount immediately after smoking, which was accompanied by a decrease of beta and theta quantities. Heart rate showed a dose-related increase which began during smoking: the peak increase was reached during the first 8 min after smoking.

In the latter part of the experimental session, THC inhibited the emergence of EEG signs of sleep. Heart rate was negatively related to the occurrence of these sleep signs. Heart rate, as well as the EEG alpha activity, increased with subjective feeling of "high". These relationships were independent of the dose of THC.

These results replicate the effects of marijuana on EEG and heart rate. THC-delta-9 elicits physiological effects which parallel the effects of marijuana.

VOLAVKA, J., LEVINE, R., FELDSTEIN, S. and FINK, M. Short-term effects of heroin in man. Archives of General Psychiatry 30:677 (May, 1974)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

VOLAVKA, J., LEVINE, R., KOMLOSI, M. and FINK, M. EEG and task performance after heroin in post-addicts. Electroencephalography and Clinical Neurophysiology 37: 195 (1974)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

WATERS, D.H. and OKAMOTO, M. Increased central excitability in nondependent mice during chronic barbital dosing. Drug Addiction: Experimental Pharmacology, Vol. 1. Edited by J.M. Singh, L. H. Miller and H. Lal. Mount Kisco, New York: Futura Publishing Company, Inc., 1972.

WAY, E.L., LOH, H.H., HO, I.K., IWAMOTO, E.T. and WEI, E. Neuroanatomical and chemical correlates of naloxone-precipitated withdrawal. Narcotic Antagonists. Edited by M.C. Braude, L.S. Harris, E.L. May, J.P. Smith and J.E. Villarreal. Advances in Biochemical Pharmacology, Vol. 8. New York: Raven Press, 1973.

Physical dependence on morphine is manifested by a highly characteristic behavior when morphine intake is abruptly terminated or when a morphine antagonist is administered. In the rodent rendered dependent on morphine by subcutaneous morphine pellet implantation, one of the most characteristic signs of withdrawal precipitated by naloxone administration is stereotyped jumping

Way, E.L., Loh, H.H., Ho, I.K., Iwamoto, E.T. and Wei, E. continued behavior. In experiments utilizing the application of crystalline naloxone to discrete brain areas of the morphine-dependent rat, the thalamus was found to be one of the, if not the, most sensitive regions responding to precipitated withdrawal. Severe withdrawal signs were elicited after administration of naloxone in the thalamus but not in the neocortical, hippocampal, hypothalamic, or tegmental areas of the brain. A study of the biochemical changes occurring during naloxone-precipitated withdrawal in the mouse revealed that the jumping response was accompanied by a sudden elevation of dopamine in the caudate nucleus while norepinephrine and serotonin remained unchanged. Pharmacologic manipulations designed to block the sudden dopamine increase effected an inhibition of the jumping response. That the dopamine increase was not the consequence of the jumping action was evidenced by the fact that dopamine increased even through jumping was prevented by D-tubocurarine. Increase in cholinergic activity by cholinesterase inhibition reduced the dopamine increase as well as the jumping response.

WEI, E. Brain lesions attenuating "wet shake" behavior in morphine-abstinent rats. Life Sciences 12, Part I: 385-392 (1973)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

WEI, E., LOH, H.H. and WAY, E.L. Neuroanatomical correlates of wet shake behavior in the rat. Life Sciences, 12, Part II: 489-496 (1973)

For abstract, see Section I. Methodology of Drug Research.

WEI, E., TSENG, L.F., LOH, H.H. and WAY, E.L. Morphine withdrawal syndrome: Similarity to thermoregulatory behavior. Presented at the Third Annual Meeting, Society for Neuroscience, San Diego, California, November 7-10, 1973.

WEISS, B. Amphetamine and the temporal structure of behavior. Amphetamines and Related Compounds: Proceedings of the Mario Negri Institute for Pharmacological Research, Milan, Italy. Edited by E. Costa and S. Garattini. New York: Raven Press, 1970.

WEISS, B. Enhancement of performance by amphetamine-like drugs. Abuse of Central Stimulants. Edited by F. Sjovist and M. Tottie. Stockholm, Sweden: Almquist and Wiksell, 1969. Pp. 31-60.

WEISS, B. Tools for the assessment of behavioral toxicity. Behavioral Toxicology: Early Detection of Occupational Hazards. Edited by C. Xintaras, B.L. Johnson and I. deGroot. Washington, D.C.: U.S. Government Printing Office, 1974. Pp. 444-449.

WEISS, B. and GOTT, C.T. A microanalysis of drug effects on fixed-ratio performance in pigeons. The Journal of Pharmacology and Experimental Therapeutics 180(2): 189-202 (1972)

Pigeons trained to peck a lighted key on a fixed-ratio 30 (FR 30) schedule of food presentation received various dose levels of dl-amphetamine sulfate, sodium pentobarbital or imipramine hydrochloride. Performance was gauged in terms of the 30 interresponse times (IRTs) within the ratio. The first IRT of the ratio, the time between reinforcement and the first response, increased in a dose-related fashion after amphetamine and imipramine and decreased after pentobarbital. The subsequent IRTs displayed similar alterations after these drugs, but the magnitude of the effect depended, in part, on ordinal position within the ratio. Further analyses revealed that changes in the incidence of IRTs greater than one second ("outliers") correlated closely with the mean IRT changes, leading to the hypothesis that drugs mainly act on the cohesiveness of the FR pattern. Changes in the character of the interval histograms revealed further, more subtle alterations, which could be viewed as springing from changes in response topography.

WEISS, B. and LATIES, V.G. Behavioral pharmacology and toxicology. Annual Review of Pharmacology 9: 297-326 (1969)

Two dominant themes in this review both grow out of the current search for correlations between brain chemistry and behavior. One is the role of adrenergic mechanisms in behavior. The other is the enhancement of learning by a drug originally claimed to affect RNA in the brain. Both surveys underscore the need to understand the behavioral mechanisms of drug action--our third theme. The fourth, behavioral toxicology, bears witness to a new concern by society and to the fact that much of what we call behavioral pharmacology is the study of selective toxicity, a point prominently featured in the previous sections. As in previous reviews, our selection of papers is meant to indicate trends, not to provide exhaustive coverage.

WEISS, B. and LATIES, V.G. Comparative pharmacology of drugs affecting behavior. Federation Proceedings 26(4): 1146-1156 (July-August, 1967)

The following points were made. Qualitative species differences in drug effects on certain components of behavior are often found, e.g., imipramine and chlordiazepoxide-like drugs increase wakefulness in the cat and dog and produce sleep in monkeys and man. In contrast, drug effects on interactional behavior, such as the effect of major and minor tranquilizers on active or passive avoidance behavior, seem more similar across species including man; the same is true of drug effects on discrimination tasks that reveal errors of omission and commission in information processing (rat and man). The prediction of drug effects from animals to man thus requires awareness of the qualitative differences in response among species (as a function of drug class), and the selection and use of animal species or strains most like humans in their baseline behavior and drug response. Systematic observational techniques are also applicable across species and can provide a broader range of behavioral and physiologic information.

WEISS, B. and LATIES, V.G. The psychophysics of pain and analgesia in animals. Animal Psychophysics: The Design and Conduct of Sensory Experiments. Edited by W.C. Stebbins. New York: Appleton-Century-Crofts, 1970.

Looking back on the history of our research on titration schedules, we are struck by how much of it was forged by an interplay of behavioral and pharmacologic questions. The development of the technique was spurred by the lack of a satisfactory behavioral approach to questions of pain and analgesia. It rather quickly became clear, however, that our ability to use the titration technique as a pharmacologic tool depended on a thorough understanding of its behavioral properties. In exploring these properties, we encountered a number of interesting behavioral questions. Given what we already knew about the complexity of drug-behavior interactions, it was a natural step to seek out the dimensions of the interaction.

A similar kind of history, substituting physiologic or anatomic for pharmacologic questions, underlies many of the other techniques described in this book. The perspective imposed by having to understand and control behavior, in order to ask intelligent questions about other variables, forces us to speak explicitly about behavioral variables. By driving investigators away from speculation and toward concrete manipulations, research in animal psychophysics should continue to make valuable contributions to a science of behavior.

WEISS, B. and LATIES, V.G. Reconciling the effects of amphetamine on human and animal behavior. Proceedings of the Twelfth Meeting of the European Society for the Study of Drug Toxicity, Uppsala, Sweden, June, 1970.

The information about how amphetamines affect human behavior comes mainly either from experiments on the enhancement of performance or from observations on drug abuse. The basic behavioral pharmacology of the amphetamines derives from experiments on animal behavior within the context of schedules of reinforcement. Reconciling these two divergent sources of data can be accomplished, at least for vigilance (signal detection) performance and simple intellectual tasks, by looking at them as examples of reinforcement schedules. If the decline in performance they typically display with time is viewed as extinction, then the restoration of performance by amphetamines can be viewed as a restoration of extinguished behavior, a result characteristic of animal behavior experiments. This way of describing amphetamine's effects on human performance makes it easier to formulate experiments on marginal toxicity and the breakdown of performance under high doses.

WHITE, R.P., DREW, G.W. and FINK, M. Neuropharmacological analysis of agonistic actions of cyclazocine in rabbits. Biological Psychiatry 1: 217-330 (1971)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

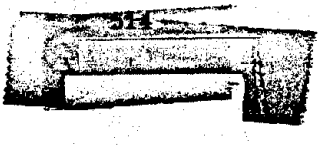
WIKLER, A. Conditioning of successive adaptive response to the initial effects of drugs. Conditional Reflex 8(4): 193-210 (October-December, 1973)

Data in the literature indicate that conditioned responses (CRs) generated by repeated pairing of conditional stimulus (CS) with administration of a neurotropic drug may resemble its unconditional effects or they may be opposite in direction; furthermore, the CRs may change as such pairings are continued. In explanation, it is hypothesized that as in conditioning of physiological reflexes, a CS repeatedly paired with administration of a neurotropic drug eventually comes to activate central "processing" events that are evoked by the "stimulus" properties of the drug, i.e., the effects of the drug at receptor sites inside or outside the pia matter which lie in the afferent arms of "reflex" neural circuits; or, the CS comes to activate central processing events that are evoked by centripetal feedback responses to the effects of the drug at receptor sites in the processing or efferent arms of reflex neural circuits. Depending on the receptor site action of the drug, the conditioned autonomic and/or neuromuscular responses that are observed may be in the same direction as, or opposite in direction to the unconditioned effects of the drug. With continued pairings of CS and drug, the unconditioned processing events evoked by the stimulus properties of the drug, and hence the CRs also, change in consequence of compensatory (sometimes "overshooting") biochemical alterations proximal to the receptor site of action of the drug, induced by negative or positive neuronal feedback mechanisms. These concepts are utilized in a theory of opiate addiction and relapse.

WIKLER, A. Dynamics of drug dependence: Implications of a conditioning theory for research and treatment. Opiate Addiction: Origins and Treatment. Edited by S. Fisher and A.M. Freedman. Washington, D.C.: V.H. Winston and Sons, 1974.

WIKLER, A. Sources of reinforcement for drug using behavior--a theoretical formulation. Pharmacology and the Future of Man, Vol. 1. San Francisco, California: Karger, Basel, 1973.

In man, social reinforcers interacting with a 'need to belong' often initiate drug-using behavior (DUB), leading in many cases to 'direct' primary pharmacological reinforcement due to interactions between specific drug actions and non-drug-engendered sources of reinforcement (SsOR), e.g. 'psychic dependence'; and, in the case of certain drugs, to 'indirect' primary pharmacological reinforcement due to interactions between specific drug actions and drug-egendered SsOR, e.g. 'physical dependence'. These reinforcement processes may become conditioned to 'exteroceptive' and/or 'interoceptive' stimuli, thus generating secondary (conditioned) pharmacological reinforcement, 'direct' or 'indirect'. In the case of the latter, relapse may be strongly facilitated through triggering, by conditioned stimuli, of previously conditioned abstinence phenomena and DUB. Treatment should include experimental extinction of both conditioned responses under specific narcotic-antagonist blockade after 'detoxification', and generation of new, socially acceptable SsOR by appropriate rehabilitative and psychotherapeutic procedures.



WIKLER, A., NORRELL, H. and MILLER, D. Limbic system and opioid addiction in the rat. Experimental Neurology 34(3): 543-557 (1972)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

WIKLER, A. and PESCOR, F.T. Persistence of "relapse-tendencies" of rats previously made physically dependent on morphine. Psychopharmacologia 16: 375-384 (1970)

1. Measurements of 24 hr tap water consumption, body weight, "wet dog" shake frequency and free choice drinking (etonitazene, 5 meg/ml versus distilled water) were made at intervals up to 434 days following abrupt withdrawal of morphine (from a daily maintenance dose level of 200 mg/kg i.p.) in one group of rats ("postaddicts") and following termination of i.p. injections of saline in a control group of rats ("normals").

2. During the first five days after termination of injections, signs of primary morphine abstinence were observed in the "postaddict" rats: transient decrease in 24 hr tap water consumption and in body weight, and increase in "wet dog" shake frequency.

3. Secondary morphine-abstinence phenomena, consisting of significantly greater 24 hr tap water consumption and slightly higher "wet dog" shake frequency (compared with normal rats) were observed in "postaddict" rats over the 7th-23rd post-injection days. Thereafter, these differences persisted, but not at significant levels.

4. In a no-choice test (etonitazene, 5 mcg/ml or water on different occasions) conducted between the 28th and 37th days after termination of injections, "postaddict" rats drank significantly more etonitazene than water, whereas normal rats drank slightly less etonitazene than water.

5. In free-choice drinking tests (etonitazene, 5 mcg/ml versus water) conducted at intervals over a period of 434 days following termination of injections (morphine or saline), no significant differences in mean water consumption between "postaddict" and normal rats were observed. In contrast, "postaddict" rats drank significantly larger mean volumes of the etonitazene solution on every "relapse" test through the 336th and again on the 406th post-withdrawal day (but not on the 372nd or 434th day).

6. It is concluded that in the "postaddict" rat a "need" for an opioid persists for about one year after abrupt withdrawal of morphine, and that this "need" is based on long-term derangement of homeostasis. Although the physiological characteristics of such homeostatic derangement differ in the relatively short primary and more protracted secondary abstinence periods.

7. The long persistence of "relapse-tendency" in rats previously made physically dependent on morphine may be based on such long-term derangement of homeostasis coupled, perhaps, with "interoceptive" conditioning generated during daily cycles of primary abstinence from and relief by morphine in the "addiction" period, through which the internal sensorial effects of opioids (morphine while receiving injections; etonitazene imbibed in "relapse" tests) may acquire secondary reinforcing properties.

WIKLER, A., PESCOR, F.T., MILLER, D. and NORRELL, H. Persistent potency of a secondary (conditioned) reinforcer following withdrawal of morphine from physically dependent rats. Psychopharmacologia 20: 103-117 (1971)

1. On 9 nights (2000-0800) over a 25-day period, an anise-flavored aqueous solution of etonitazene, 5 mcg/ml, was provided as the sole drinking fluid for one group of physically dependent rats (MFETZ) maintained on morphine, 200 mg/kg i.p. once daily at 0800 (hence acutely abstinent each night) and for one group of saline-injected rats (SFETZ), while only anise-flavored water was available to comparable physically dependent (MFH_2O) and saline-injected (SFH_2O) groups.

2. Beginning 3 days after abrupt and permanent termination of morphine or saline injections, all rats were tested at intervals over a period of 287 days on nocturnal (2000-0800) choice drinking from 2 tubes (positions alternated), one contained anise-flavored water and the other, plain water.

3. Analyses of variance on the mean volumes of each of the two fluids consumed by each rat over blocks of choice-drinking tests revealed that through the VIIth test (137th post-injection day), MFETZ drank more anise-flavored water than any other group while there were no significant differences among the groups as regards consumption of plain water.

4. The evidence indicates that the potency of secondary reinforcers so generated can persist long after morphine withdrawal. Some implications for problems of relapse and treatment of opioid addicts are discussed.

WILSON, M.C. Discriminative properties of psychomotor stimulants in the rat. The Pharmacologist 15(2): 236 (1973)

Subjects were trained in the absence of exteroceptive stimuli under two experimental conditions (two lever situation), i.e., an i.p. inj. of saline or of 1.0 mg/kg of l-amphetamine ten min. prior to the experimental session, on a fixed-ratio (FR) ten schedule of food reinforcement. Two consecutive saline sessions were followed by two consecutive l-amphetamine sessions or vice versa with "test" sessions conducted every Friday. The saline, l-amphetamine sequence was reversed at weekly intervals. The "test drug" was administered i.p. ten minutes prior to the start of the experimental session. Responses on either lever did not result in food pellet presentation; the sequence and location of the first 100 responses were recorded as was the time required to make these responses. Dose response relationships for three or more dosages of phenmetrazine, d-amphetamine, fenfluramine, l-amphetamine, chlorphentermine, methylphenidate and atropine were ascertained. The results indicated that neither anorexia nor central stimulation (as determined by effects on a Sidman avoidance paradigm) was the effect used to discriminate between the two states.

WILSON, M.C., HITOMI, M. and SCHUSTER, C.R. Further studies of the self-administration of psychomotor stimulants in the rhesus monkey. Committee on Problems of Drug Dependence. Washington, D.C.: National Academy of Sciences, National Research Council, 1969. Pp. 6057-6063.

Data obtained from the present study demonstrated that comparable results are obtained with other psychomotor stimulants such as methylphenidate, phenmetrazine and pipradrol. The results seem to indicate that either a regulatory mechanism or a drug effect per se exists which controls the total amount of psychomotro stimulant drugs which the monkeys will self-administer.

WILSON, M.C., HITOMI, M. and SCHUSTER, C.R. Psychomotor stimulant self-administration as a function of dosage per injection in the rhesus monkey. Psychopharmacologia 22: 271-281 (1971)

The relationships between drug dosage per injection and response rate, and drug dosage per injection and total daily drug intake were ascertained in Rhesus monkeys which self-administered cocaine, pipradrol, methylphenidate and phenmetrazine intravenously. The study demonstrated the monkeys would self-administer all of these compounds over a wide range of dosages. Furthermore, the magnitude of reinforcement, i.e., dosage per injection, and the rate of responding in self-administering these compounds were inversely related. However, total daily drug intake was independent of the dosage per injection over a wide range of dosages. The results indicate that either the subjects can compensate for large changes in unit dosage so that daily drug intake remains stable or that a direct effect of these compounds functions in limiting their self-administration.

WILSON, M.C. and SCHUSTER, C.R. The effects of chlorpromazine on psychomotor stimulant self-administration in the rhesus monkey. Psychopharmacologia 26: 115-126 (1972)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

WILSON, M.C. and SCHUSTER, C.R. The effects of stimulants and depressants on cocaine self-administration behavior in the rhesus monkey. Psychopharmacologia 31: 291-304 (1973)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

WILSON, M.C. and SCHUSTER, C.R. Pharmacological modification of the self-administration of cocaine and SPA in the rhesus monkey. Committee on the Problems of Drug Dependence. Washington, D.C.: National Academy of Sciences, National Research Council, 1968.

For abstract, see Section III. Mechanisms of Action of Different Drugs.

WILSON, T.W., WALLACE, S.C. and McMILLAN, D.E. Morphine drinking as a model of opiate dependence. Presented at the 52nd General Session of the International Association for Dental Research and the Annual Session of the North American Division of IADR. Dental Research (in press)

For abstract, see Section I. Methodology of Drug Research.

WINTER, J.C. Behavioral effects of n,n-diethyltryptamine: Absence of antagonism by xylamidine tosylate. The Journal of Pharmacology and Experimental Therapeutics 169(1): 7 (1969)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

WINTER, J.C. A comparison of the stimulus properties of mescaline and 2,3,4-trimethoxyphenylethylamine. The Journal of Pharmacology and Experimental Therapeutics 185(1): 101 (1973)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

WINTER, J.C. The effects of 3,4-dimethoxyphenylethylamine in rats trained with mescaline as a discriminative stimulus. The Journal of Pharmacology and Experimental Therapeutics 189(3): 741-747 (1974)

It is known that the effects of mescaline (3,4,5-trimethoxyphenylethylamine), a hallucinogen, can function as a discriminative stimulus. The present investigation examined the ability of 3,4-dimethoxyphenylethylamine (DMPEA), a non-hallucinogen, to substitute for mescaline in animals previously trained with mescaline and saline. Subjects were first trained on a variable interval schedule of positive reinforcement. Two treatment conditions, mescaline hydrochloride (10 mg/kg) and saline, were then assigned to each animal. One treatment was S^D, the stimulus in whose presence responses were reinforced, and the other treatment was S^{delta}, the stimulus in whose presence no responses were reinforced. After approximately 10 sessions in which the drug treatments were alternated on successive days, a punishment contingency was added, i.e., in the presence of S^{delta}, responses were punished by the delivery of electric shock. The efficacy of the drug treatments as discriminative stimuli was established in test sessions in which responses were neither punished nor reinforced. Subsequent administration of a range of doses of DMPEA to subjects in which saline functioned as S^{delta} revealed that a dose of 10 to 30 mg/kg of DMPEA was equivalent to the training dose of mescaline. However, the same range of doses, when tested in subjects in which mescaline was S^{delta}, did not result in responding appropriate for the mescaline condition. Subsequently, direct comparisons of DMPEA and mescaline were made by substituting DMPEA for saline 1) in subjects previously trained with mescaline and saline and 2) in a second group which had previously received neither drugs nor behavioral training. Discriminated responding developed rapidly in both groups. The present results suggest that DMPEA cannot substitute for mescaline in a discriminative task and that comparable doses of the two drugs are discriminable in rats.

WINTER, J.C. Tolerance to a behavioral effect of lysergic acid diethylamide and cross-tolerance to mescaline in the rat: Absence of a metabolic component. The Journal of Pharmacology and Experimental Therapeutics 178(3): 625-630 (1971).

For abstract, see Section II. Drug Chemistry and Metabolism.

WINTER, J.C. Xylamidine tosylate: Differential antagonism of the hypothermic effects of n,n-dimethyltryptamine, bufotenine, and 5-methoxytryptamine. Archives internationales de Pharmacodynamie et de Therapie 198(1): 61 (1972)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

WOODS, J. H. Effects of morphine, methadone, and codeine on schedule-controlled behavior in the pigeon and rhesus monkey. Federation Proceedings 28: 511 (1969)

Rhesus monkeys and pigeons were reinforced with food presentations for responding following either fixed intervals (FI) of time or fixed numbers (FR) of responses. Visual signals indicated which schedule was in force. At small doses of the drugs used, FI responding was occasionally stimulated though FR responding was not. At larger doses, all of the drugs produced dose-related decreases in both FI and FR responding. At intermediate doses, methadone and codeine produced equal decrements in FI and FR responding whereas morphine depressed FI responding more than FR responding. Using FR responding to assess the relative potency of these drugs, codeine was least potent; methadone and morphine were equally potent. In the pigeon, naloxone counteracted the morphine-induced depression of responding.

WOODS, J. H., DOWNS, D. A. and VILLARREAL, J. E. Changes in operant behavior during deprivation- and antagonist-induced withdrawal states. Psychic Dependence. Edited by L. Goldberg and F. Hoffmeister. New York: Springer-Verlag, 1973.

Deprivation-induced and antagonist-induced changes in narcotic-dependent monkeys are very comparable in many respects. The two methods of inducing withdrawal elicit nearly identical behavioral and physiological signs. In addition, operant behavior appears to be similarly affected by deprivation and by antagonists. Non-drug reinforced behavior is disrupted by withdrawal regardless of the method of induction. Narcotic-reinforced responding is affected in much the same way by both methods of inducing of abstinence unless responding is correlated with amount of narcotic delivered. In the latter case, deprivation-induced withdrawal is ineffective in modifying morphine-reinforced responding. On the other hand, antagonists can cause increases or decreases in narcotic-reinforced responding depending upon the manner in which they are presented in relation to behavior. The successful application of antagonists in paradigms of aversive control (punishment and negative reinforcement) suggests that these procedures will be useful in the elucidation of behavioral processes associated with narcotic dependence.

WOODS, J. H. and SCHUSTER, C. R. Changes in operant behavior during withdrawal from morphine. Committee on Problems of Drug Dependence. Washington, D. C.: National Academy of Sciences, National Research Council, 1967. P. 5073.

WOODS, J. H. and SCHUSTER, C. R. Self-administration of pentazocine by the rhesus monkey. Committee on Problems of Drug Dependence. Washington, D. C.: National Academy of Sciences, National Research Council, 1969. Pp. 6052-6056.

WOODS, J. H. and TESSEL, R. E. Fenfluramine: Amphetamine congener that fails to maintain drug-taking behavior in the rhesus monkey. Science 185: 1067-1069 (September, 1974)

Fenfluramine, over a dose range from 0.003 to 3 milligrams per kilogram of body weight, failed to maintain self-injection behavior in rhesus monkeys that had initiated and maintained responding for cocaine or methohexital. This absence of a positive reinforcing effect could not be attributed to a slow onset of drug effect or to the use of behaviorally inactive doses. Fenfluramine, because of its distinctive properties, may produce fewer problems of human abuse than do amphetamine-type agents.

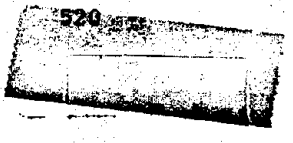
WOODS, J.H., WINGER, G.D. and STITZER, M. Patterns of barbiturate-reinforced responding in the rhesus monkey. The Pharmacologist 13: 206 (1971)

Rate and pattern of lever-press responding were studied when a response on one of two available levers led to the intravenous delivery of one of several barbiturates or saline. Access to the drug was limited to 3 hr/ 24 hr except for barbital which was limited to 3 hr/72 hr. Lever responding was increased and maintained by the following ranges of dose/injection: barbital (0.625 - 10.0 mg/kg), pentobarbital (0.25 - 4.0 mg/kg), amobarbital (0.25 - 4.0 mg/kg), Thiopental (0.50 - 4.0 mg/kg), methohexital (0.25 - 2.0 mg/kg). The reinforcing effects of these drugs were indicated by higher rates of responding on the lever that delivered the drug than on the inactive lever and by lower rates of responding when saline was delivered rather than one of the barbiturates. Rates of responding were inversely related to dose delivered with each injection for each of the barbiturates over the above ranges. Responding in some monkeys tended to occur in bursts followed by pauses, particularly with barbiturates of intermediate duration.

WUTTKE, W. The effects of d-amphetamine on schedule-controlled water-licking in the squirrel monkey. Psychopharmacologia 17: 70-82 (1970)

Three squirrel monkeys performed under a 5-min fixed-interval schedule of food presentation with licking a water-filled tube as the required operant response. All subjects developed the characteristic fixed-interval pattern of responding: an initial period of little or no responding followed by acceleration of responding to a final rate that is sustained until reinforcement. Over a range of doses, d-amphetamine had a dose-related enhancing effect on the overall rate of licking; higher doses decreased the overall rate. Analysis of the effects of d-amphetamine on the different rates within successive 30-sec periods of the interval showed that all doses in one subject and the higher doses in the two others changed the output of the licking behavior in a rate dependent way. Over a range of doses d-amphetamine not only increased the rate of licking but also the intake of water directly proportional to the number of responses. After high doses, which still increased the rate of responding, the water intake per lick decreased. The effects of d-amphetamine on licking behavior maintained under a fixed-interval schedule of food presentation were similar to the effects of amphetamine on other operant responses, such as pressing a lever or pecking a key. Schedule-controlled licking is influenced by d-amphetamine differently from drinking which is not under the control of explicit experimental consequences.

YANAGITA, T., ANDO, K., TAKAHASHI, S. and ISHIDA, K. Self-administration of barbiturates, alcohol (intragastric) and CNS stimulants (intravenous) in monkeys. Committee on Problems of Drug Dependence. Washington, D.C.: National Academy of Sciences, National Research Council, 1969. Pp. 6052-6056.



YANAGITA, T., HAGA, M. and SATO, S. Voluntary inhalation of organic solvents by monkeys. Committee on Problems of Drug Dependence. Washington, D.C.: National Academy of Sciences, National Research Council, 1969. Pp. 6064-6068.

YOKEL, R.A. and PICKENS, R. Intravenous self-administration of dextro and levo isomer of amphetamine and methamphetamine by rats. The Pharmacologist 13(2): 281 (1971)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

ZAKS, A., FINK, M. and FREEDMAN, A. Duration of methadone induced cross-tolerance to heroin. British Journal of the Addiction 66: 205-208 (1971)

ZAKS, A., FINK, M. and FREEDMAN, A.M. Levomethadyl in maintenance treatment of opiate dependence. Journal of the American Medical Association 220(6): 811 (May, 1972)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

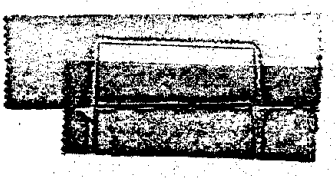
ZEMP, J.W. and MIDDAUGH, L.D. Some effects of prenatal exposure to d-amphetamine sulfate and phenobarbital on developmental neurochemistry and on behavior. International Journal of Addictive Diseases (in press)

Amphetamine. Prenatal intraperitoneal injection of d-amphetamine sulfate (5 mg/kg) produces decreases in the levels of catecholamines in the brain the day of birth and increases on day 30. Open field activity from days 12 to 31 was higher for group of animals injected with amphetamine or saline if scores were totaled across all test days. At day 75 the offspring of amphetamine-injected mothers exhibited altered open-field behavior. The effects were not observed with subcutaneous injection regardless of the dose used (2.5, 5.0, and 10.0 mg/kg). The lowest subcutaneous dose decreases neonatal viability.

Phenobarbital. Prenatal intraperitoneal injection of phenobarbital (80 mg/kg) resulted in decreased litter size, increased mortality, and decreased amounts of nucleic acid and protein in the brains of surviving offspring. Behavioral deficits associated with response perseveration could be demonstrated at 60 days in the mice prenatally exposed to this dosage. Subcutaneous injections of phenobarbital to pregnant mice at 80 and 40 mg/kg, but not 20 mg/kg, doses increased neonatal mortality. Mature animals prenatally exposed to 40 mg/kg phenobarbital have altered open field behavior and differ from control animals on a passive avoidance task. Mature offspring prenatally exposed to the 20 or 40 mg/kg dose also responded less than controls on an operant task requiring an increasing number of responses per reinforcement. These studies suggest that prenatal exposure to phenobarbital has in some way altered the animals reactivity to stimulation.

ZIMMERBERG, B., CHARAP, A.D. and GLICK, S.D. Behavioral effects of in utero administration of morphine. Nature 247: 376-377 (February, 1974)

ZIMMERBERG, B., GLICK, S.D. and JARVIK, M.E. Impairment of recent memory by marihuana and THC in rhesus monkeys. Nature 233: 343-345 (October, 1971)



V

Adverse Effects, Toxicity and Genetic Effects

V. Adverse Effects, Toxicity and Genetic Effects

ABEL, E.L., editor. Behavioral and Social Effects of Marijuana. New York: MSS Information Corporation, 1973.

For abstract, see Section II. Drug Chemistry and Metabolism.

ABRAMS, C.A.L. Cytogenetic risks to the offspring of pregnant addicts. International Journal of Addictive Diseases (in press)

Peripheral blood chromosomes were studied in 34 newborn infants who had been exposed to heroin and methadone in utero, and in 22 matched controls. Those infants (16) exposed predominantly to heroin showed a significant increase in the frequency of chromosomal aberrations compared with 14 controls (p less than 0.0001), whereas those (18) exposed predominantly to methadone showed no significant difference in the incidence of chromosomal aberrations compared with 8 controls. Chromosomal rearrangements (dicentrics, rings, markers) were observed, however, in both drug-exposed groups which leads us to suspect that heroin and methadone can induce chromosome damage in vivo, and permits us to infer that these drugs are potentially harmful to the fetus from the cytogenetic point of view.

ABRAMS, C.A.L. and LIAO, P-Y. Chromosomal aberrations in newborns exposed to heroin in utero. Presented at the 64th Annual Meeting of the American Society for Clinical Investigation, Inc., Atlantic City, New Jersey, May 1, 1972.

Equivocal evidence of chromosomal abnormalities has been found upon the administration of various psychotropic drugs. Opiates have received scant attention in this respect, and definitive information concerning their cytogenetic effects is lacking. We examined peripheral blood lymphocytes of 16 newborns aged $\frac{1}{2}$-31 days whose mothers had used heroin during pregnancy, and 14 newborn controls aged 1-13 days whose mothers were not drug users. Both groups of newborns received vitamin K before blood samples were taken. In the heroin group, five newborns had received medication for withdrawal symptoms, and one had had a viral illness before sampling. 10 mothers in the heroin group had received methadone during pregnancy. Cultures were set up in parallel for heroin subjects and controls. Whole blood inoculum (heelstick) was incubated for 72 hr, and colcemide added 2 hr before harvesting. 100 metaphases per subject were analyzed. The heroin group showed 81 chromatid breaks, 29 dicentrics, 28 fragments, 28 gaps, 9 isochromatid breaks, 5 deletions, and 3 bizarre forms in the 1600 mitoses analyzed. The control group showed 20 chromatid breaks and 4 gaps in the 1400 mitoses analyzed. The mean values for damaged chromosomes and for damaged cells in the heroin group were found to be 6 times higher than the corresponding values in the control group (p less than 0.0001). Although other drugs and various environmental factors must be considered as possible causes of the chromosomal aberrations observed, it is permissible to infer that heroin itself played the major role.

ADAMS, P.M. and BARRATT, E.S. Effect of chronic marijuana administration on stages of primate sleep-wakefulness. Biological Psychiatry (in press)

For abstract, see Section IV. Behavioral Studies.

ADLER, M.W., BENDOTTI, L., GHEZZI, D., SAMANIN, R. and VALZELLI, L. Dependence to morphine in differentially housed rats. Psychopharmacologia (in press)

ADLER, M.W., KOSTOWSKI, W., RECCHIA, V. and SAMANIN, R. Anatomical specificity as the critical determinant of the effect of raphe lesions on morphine analgesia. European Journal of Phamacology (in press)

ADLER, M.W., LIN, C., SMITH, K.P., TRESKY, R. and GILDENBERG, P.L. Lowered seizure threshold as a part of the narcotic abstinence syndrome in rats. Psychopharmacologia 35: 243-247 (1974)

For abstract, see Section I. Methodology of Drug Research.

AMAROSE, A.P., SCHUSTER, C.R. and MULLER, T.P. An animal model for the evaluation of drug induced chromosome damage. Oncology 27: 550-562 (1973)

For abstract, see Section III. Mechanism of Action of Different Drugs.

ASTON, R. Mechanisms contributing to barbiturate intolerance in rats. British Journal of Pharmacology 49: 527 (1973)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

ASTON, R. and HIBBELN, P. Induced hypersensitivity to barbital in the female rat. Science 157(3795): 1463-1464 (September, 1967)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

BAILEY, D.N. and JATLOW, P.I. Methaqualone, a new drug of abuse: Studies of analytical methodology and interpretation of serum drug levels in overdose. Clinical Chemistry 19: 666 (1973)

For abstract, see Section I. Methodology of Drug Research.

BAILEY, D.N. and JATLOW, P.I. Methaqualone overdose: Analytical methodology, and the significance of serum drug concentrations. Clinical Chemistry 19: 615-629 (1973)

For abstract, see Section I. Methodology of Drug Research.

BAILEY, D.N. and JATLOW, P.I. Methyprylon overdose: Interpretation of serum drug concentrations. Clinical Toxicology 6(4): 563-569 (1973)

Serum drug concentrations were obtained in 10 cases of methyprylon (Noludar) overdose seen at our medical center over a two-year period. A retrospective correlation of clinical findings with drug concentrations was made and compared with findings in other reported cases. Methyprylon concentrations in serum ranged from 1.7 to 8.8 mg/100 ml. Concentrations above 3.0 mg/100 ml were associated with unconsciousness whether or not other drugs were ingested. Six of the 10 cases involved at least one other drug in addition to methyprylon. All patients recovered quickly with supportive therapy only. Hemodialysis was not required in any of the cases.

BELLVILLE, J.W., SWANSON, G.D., HALDEMANN, G., AQLEH, K. and SATO, T. Respiratory effects of tetrahydrocannabinol, pentobarbital and alcohol. Proceedings of the Western Pharmacological Society 17: 215-218 (1974)

It is widely accepted that one isomer of tetrahydrocannabinol (delta-9-THC) is the major active compound in hashish and marijuana (1). While it has some stimulatory properties, it has many depressant qualities. Although it does not fit in a class of compounds similar to the barbiturates or the alcohols, it has been compared to other commonly used depressant drugs such as ethanol and pentobarbital.

It has been reported to produce no respiratory depression (2) but we question the sensitivity of the methodology used. Therefore the present investigation was designed to compare the respiratory effects of delta-9-THC to alcohol and pentobarbital when these medications are given orally.

BLUM, K., McDONALD, L., MADDUX, J. and WALLACE, J.E. Production of "wet-dog" shakes by chronic administration of methadone in female rats. Drug Addiction: New Aspects of Analytical and Clinical Toxicology, Vol. 4. Edited by J.M. Singh and H. Lal. Mount Kisco, New York: Futura Publishing Company, Inc., 1973. Pp. 123-126.

For abstract, see Section IV. Behavioral Studies.

BOLT, A.G. and FORREST, I.S. Metabolic studies of chlorpromazine-induced hyperpigmentation of the skin of psychiatric patients. Agressologie 9(2): 201-207 (1968)

BOND, D.D., BRACELAND, F.J., FREEDMAN, D.X., FRIEDHOFF, A.J., KOLB, L.C. and LOURIE, R.S., editors. The Year Book of Psychiatry and Applied Mental Health 1971. Chicago: Year Book Medical Publishers, Inc., 1971.

One chapter, entitled "Addiction and Drug Abuse," reviews treatment of narcotic addiction, effects of marihuana, marihuana psychosis, adverse reactions to marihuana, studies of marihuana users, drug abuse in adolescents, nature and extent of speed use in North America, effects of tranquilizing drugs and effects of smoking cigarettes.

BORGEN, L.A., DAVIS, W.M. and PACE, H.B. Effects of prenatal delta-9-tetrahyrocannabinol on the development of rat offspring. Pharmacology Biochemistry and Behavior 1: 203-206 (1973)

Pregnant rats were injected SC with 10 mg/kg delta-9-tetrahydrocannabinol (delta-9-THC) or vehicle solution on Days 10-12 of gestation. The course of pregnancy and parturition was unaffected by this drug treatment. The litter size, sex ratio, average birth weight and external appearance of the progeny did not differ from normal. Twenty-four male pups were selected from each of 6 delta-9-THC litters and 7 control litters for observations of physical maturation and for testing of reflexive and exploratory behavior development from birth to weaning. Cross fostered controls were employed. Offspring of delta-9-THC treated females showed delayed incisor eruption and retarded development of cliff avoidance and visual placing reflexes. Delta-9-THC progeny were significantly hyperactive in an open field arena at 9 days of age. Decrements in rearing and grooming behavior were found at 13 and 17 days of age. Differences in open field exploration had disappeared by weaning age. Although no differences in body weight were present at birth, delta-9-THC exposed pups showed retarded growth from the fourth day through weaning. The failure of cross fostering procedures to reduce any of these effects indicates a direct, prenatal drug action on the developing fetus.

BOWERS, M.B., JR. Acute psychosis induced by psychotomimetic drug abuse. II. Neurochemical Findings. Archives of General Psychiatry 27: 440-442 (October, 1972)

For abstract, see Section II. Drug Chemistry and Metabolism.

BRACELAND, F.J., FREEDMAN, D.X., FRIEDHOFF, A.J., KOLB, L.C., LOURIE, R.S. and ROMANO, J., editors. The Year Book of Psychiatry and Applied Mental Health 1973. Chicago: Year Book Medical Publishers, Inc., 1973.

One chapter, entitled "Addiction and Drug Abuse," reviews drug dependency among physicians, acute addictive states, in-patient community services for narcotic addicts, methadone treatment of opiate addiction and heroin addicts, drug abuse in juveniles, personality characteristics of marihuana users and nonusers, social and medical aspects of illicit use of LSD, emergency treatment of drug abusers, amphetamine addiction, reinforcers for drug abuse and prevention of drug abuse.

BRACELAND, F.J., FREEDMAN, D.X., FRIEDHOFF, A.J., LOURIE, R.S. and ROMANO, J., editors. The Year Book of Psychiatry and Applied Mental Health 1972. Chicago: Year Book Medical Publishers, Inc., 1972.

One chapter, entitled "Addiction and Drug Abuse," reviews complications of narcotic addiction, methadone maintenance for opiate dependence and heroin addiction, use of ancillary treatment, heroin withdrawal studies, effects of marihuana on adolescents and young adults, clinical aspects of marihuana intoxication, marihuana use among adults, adverse marihuana reactions, amphetamines, barbiturate dependence, LSD and chromosome damage, patterns of drug use, effects of smoking cigarettes and adverse effects of LSD.

BRAUDE, M.C., MANSAERT, R. and TRUITT, E.B., JR. Some pharmacologic correlates to marihuana use. Seminars in Drug Treatment 1(3): 229-246 (December, 1971)

BRIDGE, T.P. and ELLINWOOD, E.H., JR. Quaalude alley: A one-way street. American Journal of Psychiatry 130(2): 217 (1972)

BRILL, N.Q. Longitudinal study of college marijuana users. Proceedings of the Twentieth Annual Conference of Air Force Behavioral Scientists. Brooks Air Force Base, San Antonio, Texas, September, 1973.

BRILL, N.Q. and CHRISTIE, R.L. Marihuana use and psychosocial adaptation. Archives of General Psychiatry 31: 713-719 (November, 1974)

For abstract, see Section IV. Behavioral Studies.

BRILL, N. Q., CRUMPTON, E., FRANK, I. M., HOCHMAN, J. S., LOMAX, P., McGLOTHLIN, W. H. and WEST, L. J. The marijuana problem. Annals of Internal Medicine 73: 449-465 (1970)

Use of marijuana is increasing. Although predominantly used by young people, it is not confined to any age, social, or occupational group. Marijuana is unusually safe (as compared with alcohol or barbiturates). It appears to cause no physical dependence, and no tolerance develops on continued use, but psychic dependence and habituation do occur. Although statistical evidence is lacking, some clinicians believe personality changes occur in chronic users. They describe diminished drive, ambition, and motivation, along with poor judgment, distractability, impaired ability to communicate, and diminished capacity to carry out complex plans or pursue career goals and believe there is some organic basis for these changes. Others have been reluctant to attribute such changes to marijuana because the chronic user has usually taken other drugs and because chronic marijuana use may be a manifestation rather than a cause of personality disorders. Some see drug abuse by middle-class youth as a symptom of dissatisfaction with the present values and direction of society, and the solution is seen to lie in the resolution of this conflict rather than through laws or control. In the next 10 years many more mind-altering drugs will become available, making it more imperative for the development of imaginative controls to replace the punitive approaches that have aggravated rather than solved the problem.

BROOKES. L. G. and FORREST, I. S. Transplacental transfer of 3-H-chlorpromazine in guinea pigs, rabbits and sheep. Federation Proceedings 29(2): 347 (1970)

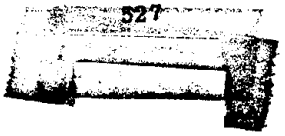
Since human feti are frequently exposed to phenothiazine or related drugs administered to the mother either during pregnancy or with the pre-delivery anesthesia, the transplacental transfer of chlorpromazine has been studied in chronically dosed rabbits, guinea pigs and sheep. Tracer doses of ^{3}H-chlorpromazine given to the maternal animals were followed in feti or neonates. Results to date indicate localization of 1 to 3% of the isotope dose in the organs of the offspring in guinea pigs and rabbits. In these species, intestine, stomach, liver and skin usually showed the major drug accumulations, followed by lung, kidney, eyes and brain, approximately in this order. Heart tissues were consistently found to store minimal amounts of drugs. Types and amounts of individual drug metabolites assayed by quantitative thin layer chromatography were compared to those seen in the adults of various mammalian species, including man.

BROOKES, L. G., HOLMES, M. A., SERRA, M. T. and FORREST, I. S. Placental transfer of chlorpromazine in rabbits and guinea pigs. Proceedings of the Western Pharmacological Society 13: 127-137 (1970)

For abstract, see Section II. Drug Chemistry and Metabolism.

BRUST, J. C. M. and RICHTER, R. W. Tetanus in the inner city. New York State Journal of Medicine 74(10): 1735-1742 (September, 1974)

Of 34 patients with tetanus seen at the Harlem Hospital Center from 1964 through 1971, 30 were heroin addicts. The case fatality rates were 70 percent for the addicts and 50 percent for nonaddicts. While curare appeared to be effective in controlling tetanospasms in those patients resistant to other agents, the most common cause of death was sudden cardiac standstill at a time when spasms were well controlled, and arterial blood gases were satisfactory. The cause of these arrests remains obscure.



BUCHENAUER, D., TURNBOW, M. and PETERS, M.A. Effect of chronic methadone administration on pregnant rats and their offspring. The Journal of Pharmacology and Experimental Therapeutics 189(1): 66-71 (1974)

Chronic administration of methadone to pregnant rats is associated with an increase in mortality compared with either nontreated pregnant rats or treated nonpregnant rats. These observations would suggest some interaction between pregnancy and methadone administration. Treatment of the female during pregnancy resulted in a decreased number of live offspring per litter, an increase in the percentage of stillborn pups, an increase in infant mortality and a retardation of growth of the pups nursing treated mothers. There was a dose-response relationship in most parameters at the lower doses used but at higher dose levels the dose-response was not as obvious. The overall effect of methadone on reproduction was seen as an increase in the number of maternal deaths, a decrease in the number of pups born per litter and a decrease in the number of pups weaned. One hundred and forty-eight pups were weaned from 20 control animals while 20 animals in each of the three treated groups, 2.5, 5 and 7.5 mg/kg of methadone, raised 78, 42 and 41 pups, respectively, to weaning age.

CATE, J.C. and JATLOW, P.I. Chlordiazepoxide overdose: Interpretation of serum drug concentrations. Clinical Toxicology 6(4): 553-561 (1973)

A retrospective study of 60 cases of chlordiazepoxide (Librium) overdose seen at this medical center was performed to establish the clinical significance of serum drug concentrations. Concentrations ranged from 0.1 to 6.6 mg/100 ml. Seventy-seven percent of the ingestions involved other drugs in addition to chlordiazepoxide, most often barbiturates and ethanol. Following ingestion of chlordiazepoxide alone, drowsiness or stupor occurred with concentrations above 2.0 mg/100 ml, but coma was not seen. If patients cannot be aroused following chlordiazepoxide ingestion, regardless of the serum concentration, another drug or cause of coma should be sought. On the other hand, chlordiazepoxide probably contributes to the total clinical picture in cases of mixed ingestions.

CHALLENOR, Y.B., RICHTER, R.W., BRUNN, B. and PEARSON, J. Nontraumatic plexitis and heroin addiction. Journal of the American Medical Association 225(8): 958-961 (1973)

Brachial and lumbosacral plexitis were observed as new complications of intravenous injection of heroin-adulterant mixtures in 13 patients (eight with brachial and five with lumbosacral plexitis). Clinical features included monoparesis with impaired sensation and hyporeflexia in the involved limb. Severe causalgia-like pain was a frequent symptom for lower-extremity lesions. Electrodiagnostic studies showed denervation in the weak limb, with localization of the causative lesion at a plexus rather than at a radicular or peripheral nerve level in 12 patients. One patient showed a radicular localization. The lesions appeared to be at least partially reversible. A direct toxic effect of the injectant or hypersensitivity reactions are possible causes.

CHAMBERS, C.D., BRILL, L. and INCIARDI, J.A. Barbiturate use misuse and abuse. Journal of Drug Issues 2(4): 15-20 (Fall, 1972)

Some of the accumulated knowledge of the prevalency of the use, misuse, and abuse of barbiturates is presented, as well as an enumeration of symptoms that might appear during intoxication and management considerations for the benefit of medical practitioners. It is suggested that all users are at risk for acute toxic reactions and some will be at risk for chronic intoxication and addiction. Minor symptoms for abusers include apprehension, muscular weakness, tremors, postural faintness, anorexia, and twitches. Major symptoms include grand mal episodes and psychoses. The 3 phases of treatment are detoxification and initial and extended abstinence. Special suicide prevention procedures should be implemented.

CHAPEL, J.L. and TAYLOR, D.W. Drugs for kicks. Crime and Delinquency 16(1): 1-35 (1970)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

CHAU, T.T., DEWEY, W.L. and HARRIS, L.S. Mechanism of the synergistic lethality between pentazocine and vasopressin in the rat. The Journal of Pharmacology and Experimental Therapeutics 186(2): 288 (1973)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

CHERUBIN, C.E., STENGER, R.E., STRAUSS, R., ROSENTHAL, W.S., PRINCE, A.M., BADEN, M. and McGINN, T.G. Chronic liver disease in asymptomatic narcotic addicts. Annals of Internal Medicine 76(3): 391-395 (March, 1972)

Liver sections from 44 consecutive autopsies of addicts were compared with 28 age matched nonaddict controls and 28 controls with gross liver abnormalities. Former addicts in a rehabilitation program were followed with liver function and SH/Australia antigen tests. Sixteen liver biopsies were obtained. Of active addicts, 12 had chronic aggressive hepatitis, 10 had chronic persistent hepatitis, and 14 had nonspecific reactive hepatitis. In both control groups, most had normal livers, fatty change, or cirrhosis. In the 16 former addicts, with persistently elevated serum glutamic-pyruvic transaminase values or SH/Australia antigenemia for 8 months or more after the cessation of drug use, only 3 liver biopsies were normal. The rest showed abnormalities similar to those of the autopsied addicts. The data suggest that a minority of addicts develop histologically severe chronic hepatitis. Most, however, have a moderate histological abnormality that probably continues for a long time, even after cessation of drug use.

CICERO, T.J., MEYER, E.R., BELL, R.D. and WIEST, W.G. Effects of morphine on the secondary sex organs and plasma testosterone levels of rats. Research Communications in Chemical Pathology and Pharmacology 7(1): 17-24 (January, 1974)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

COHEN, S., DITMAN, K.S. and HAYMAN, M., editors. Symptoms and signs of drug abuse: Continuing. Drug Abuse and Alcoholism Newsletter 1(10): 1-4 (December, 1972)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

COUSENS, K. and DiMASCIO, A. (-)-Delta-9-THC as an hypnotic. Psychopharmacologia 33: 355-364 (1973)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

CROFFORD, M. and SMITH, A.A. Growth retardation in young mice treated with dl-methadone. Science 181: 947-949 (September, 1973)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

CULVER, C.M. and KING, F.W. Neuropsychological assessment of undergraduate marihuana and LSD users. Archives of General Psychiatry 31: 707-711 (November, 1974)

For abstract, see Section IV. Behavioral Studies.

CUSHMAN, P., JR. Growth hormone in narcotic addiction. Journal of Clinical Endocrinology 35: 352 (1972)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

CUSHMAN, P., JR. Persistent increased immunoglobulin M in treated narcotic addiction. Journal of Allergy and Clinical Immunology 52(2): 122-128 (August, 1973)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

CUSHMAN, P., JR. and GRIECO, M.H. Hyperimmunoglobulinemia associated with narcotic addiction. American Journal of Medicine 54: 320-326 (March, 1973)

Increased serum immunoglobulins were common in narcotic addicts. Immunoglobulin M (IgM) levels were high in 75 percent of 46 adult addicts and in 65 percent of 63 adolescent addicts seeking methadone maintenance or detoxification. Isolated hypermacroglobulinemia was found in 56 percent. During methadone maintenance or abstinence high IgM levels were much less frequent. History of overt hepatitis, manifest liver disease, serum glutamic oxaloacetic transaminase (SGOT) or alkaline phosphatase levels did not correlate with the presence of high serum IgM levels. Serum immunoglobulin G (IgG) was used more variably and less frequently increased the IgM in the untreated addicts, but was commonly increased in the patients maintained on methadone. Prospective studies of 21 patients starting methadone maintenance showed a decrease in mean serum IgM during treatment. The incidence of normal IgM levels in these patients rose to 48 percent after one year compared to 24 percent before treatment. The pattern of immunoglobulin changes in narcotic addiction is significantly altered during methadone maintenance treatment, perhaps as a result in the reduction of drug abuse.

CUSHMAN, P., JR. and SHERMAN, C. Biologic false-positive reactions in serologic tests for syphilis in narcotic addiction. American Journal of Clinical Pathology 61(3): 346-351 (March, 1974)

Biologic false-positive (BFP) tests for syphilis was found in 23% of 69 New York heroin addicts. After 23 ± 7 months of methadone maintenance treatment, BFP decreased to 5.8%. No correlation between abnormalities in SGOT, alkaline phosphatase, albumin, total protein, and the presence or loss of BFP reactions was observed. Similarly, no correlation between serum IgM or IgG levels or latex-fixation titers and the presence or loss of BFP reactions was found. BFP is a nonspecific serologic abnormality seen in urban narcotic addicts, which is alleviated by methadone treatment, presumably as a result of reduced exposure to unknown antigens.

DAVIS, J. M., EL-YOUSEF, M. K., JANOWSKY, I. S. and SEKERKE, H. J. Treatment of benztropine toxicity with physostigmine. Fifth International Congress on Pharmacology 5: 52 (1972)

DAVIS, M. M., BROWN, B. S. and GLENDINNING, S. T. Neonatal effects of heroin addiction and methadone-treated pregnancies. Preliminary report on 70 live births. Proceedings of the Fifth National Methadone Conference, NAPAN, 1973.

The characteristics and neonatal course of infants born to methadone maintained mothers are compared to those of untreated or unsuccessfully treated heroin addicted mothers.

Futher comparisons were made by dividing the "methadone exposed" offspring in 2 groups according to maternal dosage level.

Preliminary data suggests a possible dose-effect relationship with a more favorable course in the newborns of low dosage than those of high dosage methadone maintained mothers.

Changes in the therapeutic approach to the pregnant addict are proposed.

DAVIS, M. M. and SHANKS, B. L. Neurological aspects of perinatal narcotic addiction. Addictive Diseases: An International Journal (in press)

The semiology and significance of neonatal "minor withdrawal" is developed. Its treatment and the consequent prevention of rebound, late, or classical withdrawal is proposed. Basic research implications are formulated.

DAVIS, W. M. and BRISTER, C. C. Increased toxicity of morphine-like analgesics in aggregated mice. Journal of Pharmacy and Pharmacology 23: 882-884 (1971)

DAVIS, W. M. and KHALSA, J. H. Morphine lethality in rats: Effects of inhibitors of brain catecholamine synthesis and methylation. Research Communications in Chemical Pathology and Pharmacology 6(3): 867-872 (1973)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

DAVIS, W. M. and LIN, C. H. Prenatal morphine effects on survival and behavior of rat offspring. Research Communications in Chemical Pathology and Pharmacology 3(2): 205-214 (March, 1972)

For abstract see Section IV. Behavioral Studies.

DENEAU, G. A. and KAYMAKCALAN, S. Physiological and psychological dependence to synthetic delta-9-THC in rhesus monkeys. The Pharmacologist 13(2): 246 (August, 1971)

For abstract, see Section IV. Behavioral Studies.

DENEAU, G. A. and WILSON, M. Evaluation of sedative-hypnotic agents for barbiturate-like physiological dependence capacity in the dog. Committee on the Problems of Drug Dependence. Washington, D. C.: National Academy of Sciences, National Research Council, 1970.

DEWEY, W. L. and HARRIS, L. S. Intraperitoneal infusion of narcotic antagonists in rats. Sixth International Congress of Pharmacology, Helsinski, Finland (in press)

Considerable effort has been put forth in recent years to develop long-acting preparations of a narcotic antagonist which would be useful in the rehabilitation of post-opiate addicts. We have determined the rate of release of a number of antagonists from such a preparation which would be necessary to antagonize the antinociceptive activity of morphine in rats. Male Sprague Dawley rats were anesthetized and an indwelling catheter was sutured into the peritoneal cavity one week prior to the experiment. Three groups of rats were infused with logarithmic-spaced doses of an antagonist, and the fourth group was infused with saline. Each rat was injected subcutaneously with morphine and tested on the tail flick test 20 minutes later at 24, 48, and 72 hours after the infusion was begun. At 24 hours naltrexone was the most potent antagonist tested; with an antagonistic dose 50 (AD-50) of 0.01 (0.004-0.037) mg/kg/day. Naloxone and cyclazocine were about equipotent with AD-50's of 0.25 (0.14-0.45) and 0.3(0.2-0.45) mg/kg/day respectively. Nalorphine was the least potent with an AD-50 of about 3 mg/kg/day. Some tolerance to the effects of morphine was seen in the saline infused rats, but there was no tolerance to the antagonistic activity over the 72 hour period. Although the constant infusion of these very low doses blocked the antinociceptive activity of morphine, considerably larger injected doses of the same antagonists were required to block the development of physical dependence when morphine was infused constantly over a six day period.

DEWEY, W. L., MARTIN, B. R., HARRIS, L. S. and BECKNER, J. S. Disposition of H^3-delta-9-tetrahydrocannabinol in brain of pregnant dogs and their fetuses. The Pharmacologist 16(2): 397 (1974)

For abstract, see Section II. Drug Chemistry and Metabolism.

DINGLEDINE, R. and GOLDSTEIN, A. Lethality of morphinian isomers levorphanol and dextrorphan. British Journal of Pharmacology 48: 718 (1973)

DITMAN, K. S. The value of LSD in psychotherapy. The Problems and Prospects of LSD. Edited by J. Ungerleider. Springfield, Illinois: Charles C. Thomas, 1968.

The literature contains much information concerning the therapeutic use of D-lysergic acid diethylamide (LSD) in a supervised medical setting by qualified psychiatrists and psychologists. A majority of these studies are anecdotal case histories and clinical studies without control groups (or with inadequate ones) against which to compare results. Psychotherapy with LSD can be described as psycholytic when it involves a continuing series of LSD sessions with a therapist, in which, over a period of months, the basic conflicts and symptoms are uncovered through ventilation, catharsis and abreaction. Psychedelic therapy is a different approach in which a single massive dose (200-1500mcg) is given in one protracted session in order to achieve the "rebirth" or "transcendental" conversion experience. In particular, this type of therapy has been claimed to be extremely helpful with chronic alcoholics who have not responded to any other form of treatment. Adverse experiences with LSD are frequently reported, particularly in an unsupervised, nonmedical setting.

DITMAN, K. S., MOSS, T., FORGY, E. W., ZUNIN, L. M., LYNCH, R. D. and FUNK, W. A. Dimensions of the LSD, methylphenidate and chlordiazepoxide experiences. Psychopharmacologia 14(1): 1-11 (1969)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

DITMAN, K. S., TIETZ, W., PRINCE, B. S., FORGY, E. and MOSS, T. Harmful aspects of the LSD experience. Journal of Nervous and Mental Disease 145(6): 464-474 (1967)

Some people have had disastrous reactions to the LSD experience, including psychotic episodes and suicide. Others claim no bad effects, but benefits from their LSD usage. In an attempt to understand this anomaly, 116 subjects were studied. They were classified into 3 groups: Those not requiring therapy after their LSD experience, those needing psychiatric outpatient care as a result of taking LSD, and those hospitalized after LSD usage. All subjects were interviewed to obtain biographical data and were administered the DWM card sort (consisting of 156 items descriptive of the LSD experience), which they were required to evaluate on a 5-point scale, ranging from "very much like the experience" to "very much unlike the experience." Statistical analysis revealed that the LSD sessions were more unpleasant for those groups requiring psychiatric care than for those requiring no treatment. The hospitalized group experienced more depression and paranoia than did the other groups.

DOMINO, E. F. Cholinergic mechanisms in narcotic dependence and withdrawal. Journal de Pharmacologie 5(Supplement 1): 42 (1974)

For abstract, see Section II. Drug Chemistry and Metabolism.

DORRANCE, D. L., BEIGHLIE, D. J., YOSHII, V., JANIGER, O., BRODETSKY, A. M. and TEPLITZ, R. L. Studies on the mechanism of interactions between lysergic acid and chromosomes. Journal of Laboratory and Clinical Medicine 84(1): 36-41 (July, 1974)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

DORRANCE, D., JANIGER, O. and TEPLITZ, R. L. In vivo effects of illicit hallucinogens on human lymphocyte chromosomes. Journal of the American Medical Association 212(9): 1488 (June, 1970)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

DUARTE-ESCALANTE, O. and ELLINWOOD, E. H., JR. Effects of chronic amphetamine intoxication on adrenegic and cholinergic structures in the central nervous system: Histochemical observations in cats and monkeys. Current Concepts in Amphetamine Abuse. Edited by E. H. Ellinwood, Jr. and S. Cohen. Washington, D. C.: U. S. Government Printing Office, 1972. Pp. 97-106

For abstract, see Section II. Drug Chemistry and Metabolism.

EIDELBERG, E. and LOSCHIAVO, C. M. Effects of morphine and opioid antagonists on the central nervous system. Committee on the Problems of Drug Dependence. Washington, D. C.: National Academy of Sciences, National Research Council, 1969.

EIDELBERG, E. and SCHWARTZ, A. S. Consequences of selective brain biogenic depletion upon the effects of morphine in rats. Committee on Problems of Drug Dependence. Washington, D. C.: National Academy of Sciences, National Research Council, 1970. Pp. 6422-6427.

ELLINWOOD, E. H., JR. Amphetamine model psychosis: The relationships to schizophrenia. Biological Mechanisms of Schizophrenia and Schizophrenia-like Psychoses. Edited by H. Mitsuda and T. Fukuda. Tokyo, Japan: Igaku Shoin Ltd., 1974. Pp. 89-96.

ELLINWOOD, E. H., JR. Amphetamine psychosis: Individuals, settings, and sequences. Chapter 14 of Current Concepts in Amphetamine Abuse. Edited by E. H. Ellinwood, Jr. and S. Cohen. Washington, D.C.: U.S. Government Printing Office, 1972. Pp. 143-157.

Psychopathic and schizophrenic individuals are much more prone to abuse amphetamines than any other groups of psychiatric patients, and schizophrenics and borderline schizophrenics tend to be abnormally susceptible to amphetamine psychosis. These facts, however, do not explain the fairly constant paranoid schizophrenic form of the psychosis and the associated stereotypic symptom clusters. From observations of certain of these stereotyped behavior patterns in human patients, as well as in lower animals chronically medicated with amphetamine, it appears that stimulation of arousal and attention mechanisms in the central nervous system is in part responsible for the form of the psychosis.

In summary, the amphetamine psychosis can best be understood as an interaction of predisposing personality, environment, and stimulation of arousal mechanisms in the central nervous system.

ELLINWOOD, E. H., JR. Amphetamine psychosis: A multi-dimensional process. Seminars in Psychiatry 1(2): 208-226 (May, 1969)

Psychopathic and schizophrenic individuals are much more prone to abuse amphetamines than any other diagnostic groups. Schizophrenic and borderline schizophrenics tend to be more susceptible to developing the psychosis. The predilection of these individuals to use amphetamines and to develop the amphetamine psychosis does not, however, explain the fairly constant form of the psychosis, a paranoid schizophrenic-like psychosis with certain stereotypical symptom clusters. From observations of certain of these stereotyped behavior patterns in humans as well as lower animals chronically medicated with amphetamine, it appears that central nervous system arousal and attention mechanisms are being stimulated and are, in part, responsible for the form of the psychosis. The amphetamine psychosis can best be understood as an interaction of predisposing personality, environment and stimulation of central nervous system arousal systems.

ELLINWOOD, E. H., JR. Amphetamine psychosis: Systems and subjects. Drug Abuse: Current Concepts and Research. Edited by W. Keup. Springfield, Illinois: Charles C. Thomas, 1972.

ELLINWOOD, E.H., JR. Amphetamine psychosis: II. Theoretical implications. Journal of Neuropsychiatry 4(1): 45-54 (1968)

Many symptoms of temporal lobe epilepsy are presented in the amphetamine psychosis including deja vu, complex visual hallucinations, and olfactory hallucinations. The paranoid psychosis seen in temporal lobe epilepsy is similar to the amphetamine psychosis. Many of the symptoms, including hallucinations, comprise recognition phenomena and their emotive counterparts. The limbic system and the temporal lobes are probably involved in relating present experience to past categories, expecially the emotional interpretation of experiences. As with the Kluver-Bucy monkeys many amphetamine psychotics have difficulty in locating past standards, but there is also stimulation of certain visual, sexual and aggressive behavior patterns. There appears to be hyperalertness to stimuli in the lateral periphery and hyperactivity of certain minor hemisphere functions. An hypothesis for one attentional system of the cerebral cortex and its relation to the amphetamine psychosis has been presented.

ELLINWOOD, E.H., JR. Behavioral and EEG changes in the amphetamine model of psychosis. Neuropsychopharmacology of Monoamines and Their Regulatory Enzymes. Edited by E. Usdin. New York: Raven Press, 1974. Pp. 281-297.

For abstract, see Section IV. Behavioral Studies.

ELLINWOOD, E. H., JR. Chronic amphetamine intoxication in several experimental animals. Psychopharmakologie 4: 351 (1971)

ELLINWOOD, E. H., PETERSEN, D. M. and CHAMBERS, C. D. Methaqualone: Another "safe" sedative? Journal of Drug Issues (Spring, 1974)

EL-YOUSEF, M.K., DAVIS, J.M., JANOWSKY, D.S. and FANN, W.E. Central atropine-like toxicity in combined psychotropic drug administration. Tennessee State Medical Journal 65(8): 719 (1972)

FERNANDEZ, J., BRENNAN, T., MASTERSON, J. and POWER, M. Cytogenic studies in the offspring of LSD users. The British Journal of Psychiatry 124: 296-298 (March, 1974)

Because of a reported increase in chromosome aberrations, spontaneous abortions, premature births and congenital malformations in the offspring of females who had used LSD prior to and during pregnancy, the off-spring of two female psychiatric patients (S1 and S2) who had been treated with known amounts of pure d-LSD 25 prior to conception were investigated so as to ascertain whether either of the following possible teratogenic mechanisms could be held accountable: (1) A disturbance of organogenesis caused by a persistent metabolite of LSD ingested by the mother at some time prior to conception and/or (2) Chromosome damage or point mutations in parental germ cells exposed to LSD prior to initiation of a pregnancy

Results of chromosome analyses of peripheral blood leucocyte cultures of both female parents and offspring were as follows: A single chromatid gap in a long arm of a group D (13-15) chromosome was seen in the preparations from parents S2; this is well within the frequency range for such anomalies in normal control cultures. Other than this, no cytogenetic abnormality was noted in any of the total 600 cells from both mothers and infants.

FERNANDEZ, J., BROWNE, I. W., CULLEN, J., BRENNAN, T., MATHEU, H. and FISCHER, I. LSD. . . an in vivo retrospective chromosome study. Annals of Human Genetics 37: 81-91 (1973)

In a single-blind retrospective in vivo study, chromosome analyses were performed on 32 psychiatric patients who had been treated with known amounts of pure d-LSD 25 as part of their psychiatric management and on 32 controls. The control group consisted of psychiatric patients who were on comparable psychopharmacological medication - other than d-LSD 25. Peripheral blood leucocyte cultures of all 64 subjects were studied. A total of 4099 (mean = 128.09) cells were studied in the experimental subject group and 4271 (mean = 133.46) cells in the control group. There was no evidence to suggest that pure d-LSD 25 influenced chromosome structure nor was there any evidence of the presence of centric fragments resembling the Ph^1 chromosome. 31 chromosome aberrations were noted in the experimental group (0.75% of cells studied) and 25 chromosome aberrations in the control group (0.59% of cells studied). These proportions e.g. 31 aberrations in 4099 cells and 25 aberrations in 4271 cells, show a non significant difference (X/sigma = 0.96). In conclusion, there was no evidence to suggest that pure d-LSD 25 given in therapeutic amounts (Total dose range = 25 - 1425 mu-g; Mean = 375.46 mu-g) produced increased chromosomal damage.

FINK, M. Treatment and prevention of opiate dependence. Contemporary Drug Problems. Washington, D. C.: Federal Legal Publications, 1972.

FINNEGAN, L. P. Drug dependence in pregnancy. I. Its effects upon immediate and long-term maternal and neonatal outcome. II. Innovative measures for the management of the pregnant woman and the passively dependent infant. Final Report: A Survey of New Techniques for the Treatment of Drug Abuse (in press)

FINNEGAN, L. P., REESER, D., CONNAUGHTON, J. F. and SCHUT, J. Maternal methadone dependence: Effect on neonatal jaundice. Pediatric Research (in press)

FINNEGAN, L. P., SHOURARE, Z., EMICH, J. P., CONNAUGHTON, J. F., SCHUT, J. and DELIVORIA-PAPADOPOULOS, M. Alterations of the oxygen hemoglobin equilibrium curve and red cell 2, 3-diphosphoglycerate (2, 3-DPG) in cord blood of infants born to opiate-dependent women. Pediatric Research 8(4) (April, 1974)

The absence of hyaline membrane disease (HMD) in low birthweight infants of heroin addicted mothers may be due to accelerated lung maturation in utero as shown in fetal rabbits. The aim of the present studies was to assess the tissue oxygenation of infants born to opiate-dependent mothers and relate it to the clinically documented absence of HMD. The cord bloods of 14 infants weighing between 1650 and 3460 grams at birth were obtained as well as maternal venous blood. Measurements of the P50 (partial pressure of oxygen at which hemoglobin is 50% saturated) hematocrit and red cell DPG were performed in maternal and fetal bloods. All infants monitored for signs and symptoms of HMD showed no evidence of disease. Mean values of P_{50} in the cord blood were 24.0 mmHg as compared to 19.5 mmHg in control infants, total 2, 3-DPG was 7458 muM/ml of RBC as compared to 5433 in normal controls. Maternal values were slightly elevated for both (P_{50}, 2, 3-DPG) as compared to normal controls. This shift of the curve to the right is achieved in term infants by the 6th-9th week of life under normal conditions. It seems that newborns of opiate-dependent mothers achieve tissue oxygen unloading comparable to that of a 6 week old term infant suggesting that opiates may function as enzyme inducers resulting in increased blood levels of 2, 3-DPG and a decrease in 0_2 affinity.

FISCHER, R. and HILL, R. M. Psychotropic drug-induced transformations of visual space. International Pharmacopsychiatry 6: 28-37 (1971)

It was found that ergotropic arousal-inducing drugs, such as psilocybin, a Ditran®-type 'glycolate' and D-amphetamine, significantly lower human spatial distortion thresholds, i.e. these drugs interfere with counter-adaptation to optical distortion, or the intention to see the world undistorted. The trophotropic arousal-inducing chlorpromazine on the other hand promotes such counter-adaptation, i.e. the optimization of visual information. The interference with optimization is independent of the rate at which the distorting stimulus is presented.

Optimization is regarded here as a cortical (perceptual-behavioral) interpretive process while interference with and promotion of the optimization are subcortical influences.

FISCHER, R., HILL, R. THATCHER, K. and SCHEIB, J. Psilocybin-induced contraction of nearby visual space. Agents and Actions 1(4): 190-197 (1970)

Using apparent fronto-parallel plane (AFP) monitoring techniques, the relative stability of the abathic plane, i.e. Euclidean visual space, was investigated in 16 volunteers with a median age of 23.5 years under 160 mu-g/kg psilocybin-induced ergotropic arousal. Handwriting area and pressure were also measured in the same subjects.

Drug-induced contraction of nearby visual space was inferred from changes of AFP curvature and tilt, as well as from increased handwriting area at drug peak. The 'rising horizon' (Rennert) in the drawings of schizophrenics is also considered a manifestation of the contraction of visual space and is described in terms of an arousal-dependent transformation of constancies. The 'projection' of central nervous system activity as experience 'out there' is also discussed as an arousal-dependent learned constancy.

FOG, R. and PAKKENBERG, H. Loss of brain cells in rats after long-term neuroleptic treatment. Presented at the First World Congress of Biological Psychiatry, Buenos Aires, Argentina, September, 1974.

FOG, R. L., RANDRUP, A. and PAKKENBERG, H. Chlorpromazine and related neuroleptic drugs in relation to the corpus striatum in rats. The Present Status of Psychotropic Drugs. Edited by A. Cerletti and F. Bove. Amsterdam, the Netherlands: Excerpta Medica Foundation, 1969. Pp. 278-279.

FORREST, I. S. The nature of the interaction between melanin and drugs. Psychopharmacology Bulletin 10(4): 38-40 (1974)

FREEDMAN, A. and FINK, M. Cannabis psychosis. Biochemical and Pharmacologic Aspects of Dependence and Reports on Marijuana Research. Edited by H. M. van Praag. Amsterdam, the Netherlands: Ervin F. Bohn, 1972. Pp. 194-204.

FRIEDHOFF, A. J. Biogenic amines and schizophrenia. Biological Psychiatry. New York: John Wiley and Sons, 1973. Pp. 113-124.

The ability to produce relapse in schizophrenia through the administration of specific compounds, such as methionine, represents a great advance toward our understanding of this illness. These studies, as well as the isolation of specific methylated hallucinogens from the urine of schizophrenic subjects and, in the case of tryptamine analogues, the demonstration that necessary enzymes for their production are present, point toward a methylation or demethylation defect as a factor in schizophrenia.

A disturbance in the relationship between the cholinergic and dopaminergic or adrenergic systems, involved at some level of symptom production in schizophrenia, has support from several lines of investigation. If these imbalances exist, it is not clear whether they result from abnormalities in metabolism or levels of catecholamines or serotonin or acctylcholine. However, a definite role for the extrapyramidal system as a regulator of behavioral functions involved in psychosis seems to be emerging. Also, we can now design compounds with relative assurance that they will either produce psychotomimetic effects or will be useful as therapeutic agents. This represents an impressive advance in knowledge.

Finally, the great advance in technology available for the study of biological processes ensures that further understanding of these issues will evolve.

FRIEDLER, G. and COCHIN, J. Altered post-natal growth pattern of offspring of female rats chronically treated with morphine prior to mating. The Pharmacologist 9: 230 (1967)

During the course of studies on morphine tolerance in female rats, we observed a significant effect of morphine sulfate (MS) pretreatment of female breeders on body weight of their offspring. Female breeder rats, Holzman strain, were given MS subcutaneously twice daily for 6-10 days. The dose was increased stepwise to a maximum of 60 mg/kg/day. Controls were similarly injected with physiologic saline. Rats were housed in pairs, each pair consisting of one experimental and one control female. Five days after termination of the injections, a male was placed in each cage containing a female pair. Males were removed after 5 days and the females transferred to individual cages. Offspring of the MS-injected females showed a significant decrease in body weight when compared with offspring of saline-injected controls. This phenomenon, most pronounced in female offspring, is presently not understood but may involve a direct morphine effect on the hypothalamic-hypophyseal axis as well as indirect effects of morphine pretreatment on maternal care and handling of the litters.

FRIEDLER, G., and COCHIN, J. The effect of cross-fostering on growth patterns in offspring of morphinized and withdrawn female rats. Federation Proceedings 27: 754 (1968)

We previously reported a significant effect of morphine (MS) administration to female rats, prior to mating, on growth patterns of their young. Offspring of MS-injected females showed a significant decrease in body weight when compared with the young of saline-injected controls (Pharmacologist 9 :258, 1967). Cross-fostering experiments were performed in order to determine the role of either postnatal maternal care or a possible milk factor on body weight differences observed. Female rats were injected with MS s.c. twice daily for 6 days with the dose increased stepwise to a maximum of 30 mg/kg/day. Rats were mated 5 days after MS injections were terminated. One to three days after birth, the young of morphinized females were placed with untreated foster mothers where they remained until weaning at 26 days of age; control offspring were similarly cross-fostered to withdrawn females. The significant differences in body weight between experimental and control offspring reported previously were not affected by the cross-fostering procedure. It is apparent that the phenomenon cannot be explained by an indirect effect of MS pretreatment on postnatal maternal factors. Prenatal influences are indicated and may involve a transplacental mechanism.

FRIEDLER, G. and COCHIN, J. Growth retardation in offspring of female rats treated with morphine prior to conception. Science 175: 654 (1972)

Treatment of female rats were morphine sulfate for 5 1/2 or 10 days, prior to drug withdrawal for 5 days and subsequent mating, results in retarded growth of offspring. The effect is not present at birth but appears at 3 to 4 weeks of age. It occurs even though offspring are not exposed to morphine in utero or postnatally. It is not eliminated by cross-fostering and is apparently of prenatal origin.

FRIEDLER, G. and COCHIN, J. Sensitivity and tolerance to morphine sulfate (MS) in the rat as affected by neonatal thymectomy of MS-pretreatment of the mother. The Pharmacologist 10: 188 (1968)

As part of a continuing study on the possible role of immune phenomena in the response to morphine two appreaches were used: 1) the effect of neonatal thymectomy; and 2) the effect of treating females with MS, prior to withdrawal, for 5 days and subsequent mating, on the responses to MS of their progeny. Holtzman male and female rats were tested for their initial reaction to a 10 mg/kg test dose of MS at 7 weeks of age, using latency of response to a thermal stimulus as a measure of the drug effect. Animals were retested at 1, 3 and 11 week intervals to assess the development of tolerance. No differences in tolerance were observed: between neonatally thymectomized rats and their sham-operated or non-operated controls; and between offspring of MS- or saline-pretreated females. However, a significant reduction in hot-plate response to the initial test dose of MS appeared among offspring of MS-pretreated females. The results indicate that treatment of the mother prior to conception affects the response of offspring to MS.

GARRETT, E. R., BRES, J., SCHNELLE, K. and ROLF, L.L., JR. Pharmacokinetics of saturably metabolized amobarbital. Journal of Pharmacokinetics and Biopharmaceutics 2(1): 43-103 (1974)

For abstract, see Section I. Methodology of Drug Research.

GEBER, W. F. and SCHRAMM, L. C. Effect of marihuana extract on fetal hamsters and rabbits. Toxicology and Applied Pharmacology 14: 276-282 (1969)

Malformations of the brain, spinal cord, foreleg, and liver as well as edema of the head and spinal region were found in fetal hamsters and rabbits from mothers injected subcutaneously with multiple doses of marihuana extract (resin) from crude plant material grown in either New Jersey or Mexico. Pregnant hamsters received a total of 25-300 mg/kg of extract during days 6 through 8 of gestation. Pregnant rabbits received a total of 130-500 mg/kg of extract during days 7 through 10 of gestation. The extracts were embryocidal and increased the number of runts in the fetal rabbits. The extracts were not embryocidal toward the fetal hamster but did increase the proportion of runts found to greater than the control percentage.

GEBER, W. F. and SCHRAMM, L. C. Teratogenicity of marihuana extract as influenced by plant origin and seasonal variation. Archives Internationales de Pharmacodynamie et de Therapie 177(1): 224-230 (January, 1969)

Correlative studies of the teratogenic and psychotomimetic characteristics of mescaline, lysergic acid diethylamide, and brom lysergic acid diethylamide have been previously reported.

In the present study, a psychotomimetic material of an entirely different chemical class, i.e. Cannabis sativa resin, believed to represent a composite of the major active constituents of the marihuana plant, has been evaluated for both its central nervous system and teratogenic activity in the hamster fetus.

Two variables were programmed into the experiments, the origin of the plant material, and the season of the year during which the studies were carried out. The crude marihuana plant samples were established to have been grown in New Jersey and Mexico, although the exact location within these geographical areas could not be determined. In addition, one series of experiments was conducted during the period May through September, and another series November through January.

GESSNER, P. K. Antagonism of the tranyclypromine-meperidine interaction by chlorpromazine in mice. European Journal of Pharmacology 22:187-190 (1973)

Chlorpromazine protected mice against the toxicity resultant from administration of tranylcypromine and meperidine 4 hr. apart in a 3/10 ratio by weight. Doses of 3 mg/kg chlorpromazine administered i.p. 1 hr. prior to meperidine completely reversed the mortality seen after the i.p. administration of 21 mg/kg tranylcypromine and 70 mg/kg meperidine. Chlorpromazine was also found to protect mice significantly against meperidine toxicity.

Administration of chlorpromazine, 10 mg/kg, 3 hr. after tranylcypromine resulted in a marked fall in body temperature and a failure of meperidine, administered 1 hr. later, to bring about the hyperthermic response seen in control.

GESSNER, P. K. and SOBLE, A. G. Antagonism of p-chlorophenylalanine of late tranylcypromine toxicity. Journal of Pharmacy and Pharmacology 24:825-827 (1972)

GOLDSTEIN, A. and GOLDSTEIN, D. B. Enzyme expansion theory of drug tolerance and physical dependence. Chapter XIX of The Addictive States, Vol. XLVI. Association for Research in Nervous and Mental Diseases. Baltimore, Maryland: The Williams and Wilkins Company, 1968, Pp. 265-267.

GOLDSTEIN, J. W. Students' evaluations of their psychoactive drug use. Journal of Counseling Psychology (in press)

Evaluations were obtained with the same questionnaire item in 1968, 1969, 1970, and 1972 at Carnegie-Mellon University. The evaluations of marijuana and LSD experiences reported in 1968 were very similar to those at California Institute of Technology in 1967. Evaluations varied by drug, but were predominately "beneficial and helpful" (marijuana, hallucinogens, tranquilizers/barbiturates), or "no particular effect" (amphetamines, beer, liquor, tobacco, narcotics). In the Class of 1972, evaluations were positively related to number of usage experiences, and remained steady over time for all drugs except hallucinogens; these were seen less positively in later surveys. More negative experiences resulted from hallucinogen use than from any other drug. Statements about drug effects are evaluated against personal and peer experience and expectations, thus counselors and educators need to know that most experiences are seen as beneficial or neutral.

GRAHAM, J. M., JR., SCHREIBER, R. A. and ZEMP, J. W. Effect of d-amphetamine sulfate on susceptibility to audiogenic seizures in DBA/2J mice. Behavioral Biology 10: 183-190 (1974)

For abstract, see Section IV. Behavioral Studies.

GUPTA, S., GRIECO, M. H. and CUSHMAN, P., JR. Impairment of rosette-forming T lymphocytes in chronic marihuana smokers. New England Journal of Medicine 291: 874-877 (October 24, 1974)

Rosettes formed by circulating T and B lymphocytes obtained from 23 healthy, chronic marihuana smokers were compared with those in 23 normal control subjects who denied marihuana use. The mean percentage of T cells forming rosettes was lower in the marihuana smokers (p less than 0.005). Nine of 23, or 39 per cent, had T-cell rosette formation lower than 2 standard deviations below the mean for control subjects. The percentages of B-cell rosettes were similar in both marihuana smokers and the controls. This study suggests suppression of a T-lymphocyte subpopulation in chronic marihuana smokers.

HANAWAY, J. K. Lysergic acid diethylamide: Effects on the developing mouse lens. Science 614: 574-575 (May, 1969)

High doses (5×10^{-6} gram) of LSD-25 given to Swiss-Webster females on gestation days 6, 7, 8, or 9 caused a high incidence of anterior subcapsular lens abnormalities. Accompanying this, the lens epithelium was often hyperplastic, and the lens bow was widened posteriorly in a fashion similar to cataracts induced by x-radiation. Confirmation of this effect of LSD-25 was obtained by a (duplicate) experiment 1 year after the observations reported.

HARBISON, R. D. and MANTILLA-PLATA, B. Prenatal toxicity, maternal distribution and placental transfer of tetrahydrocannabinol. The Journal of Pharmacology and Experimental Therapeutics 180(2): 446-453 (1972)

Delta-9-tetrahydrocannabinol (delta-9-THC) was embryo- or fetocidal when administered to pregnant mice. Delta-9-THC administered on days 8 and 9 of gestation produced about 70% incidence of in utero deaths. Delta-9-THC induced about 30% incidence of in utero deaths when administered on gestational days 10 and 11 or days 12 and 13. Delta-9-THC also significantly reduced fetal body weight. Again, there was a gestational period susceptibility. After i.p. administration of ^{14}C-labeled delta-9-THC, ^{14}C was measured in maternal plasma. The greater accumulation of ^{14}C was found in maternal fat and liver tissue. Smaller amounts of ^{14}C were measured in maternal kidney, muscle and brain tissue. Delta-9-THC was transferred across the placenta and was measured in fetal tissue and amnionic fluid. Excretion of delta-9-THC was primarily by feces and at 120 hours after injection about 10% of the dose remained in the animals. Maximum excretion of delta-9-THC in the urine was about 10% of the administered dose. Thus, delta-9-THC is transferred across the placenta and is embryocidal or fetocidal.

HARINDRANATH, A., FEINGOLD, E., SOKAL, M., HARPER, R. G. and SOLISH, G. Cellular content of placentas of methadone-maintained addicts. Society for Pediatric Research (in press)

Babies born to narcotic-addicted mothers are often growth retarded in utero. Placentas from 12 methadone-maintained pregnant narcotic addicts and 7 non-addicted pregnant patients were analyzed for weight and RNA and DNA content to determine the effect of methadone on the cellular growth of the placenta. The patients and controls were healthy and comparable in age, race, parity and length of gestation. Frequent urines for drug-screening were obtained on all participants.

Mean birth weight of infants born to methadone-maintained mothers was similar to that of control patients (3079 gm ± 448 gm vs 3206 gm ± 695 gm P greater than 0.05), as was mean placental weight (536 ± 130 gm vs 532 ± 104 gm). There was no significant difference in either RNA or DNA contents of the placentas of methadone patients and control patients (RNA 0.82 ± 0.29 gm vs 0.77 gm ± 0.29 gm; DNA 1.72 ± 0.44 gm vs 1.47 ± 0.30 gm).

In our study methadone did not retard the intrauterine growth of the fetus or the cellular growth of the human placenta.

HARVEY, J. A., McMASTER, S. E. and YUNGER, L. M. p-Chloroamphetamine: Selective neurotoxic action in brain. Science (in press)

HILL, J. H., WAINER, B. H., FITCH, F. W. and ROTHBERG, R. M. The interaction of ^{14}C-morphine with sera from immunized rabbits and from patients addicted to heroin. Clinical Experimental Immunology 15: 213-224 (1973)

For abstract, see Section II. Drug Chemistry and Metabolism.

HO, I. K., YAMAMOTO, I., LOH, H. H. and WAY, E. L. Enhancement of pentobarbital responses after morphine addiction. The Pharmacologist 16(2): 193 (1974)

For abstract, see Section II. Drug Chemistry and Metabolism.

HOCHMAN, J. S. and BRILL, N. Q. Chronic marijuana use and psychosocial adaptation. American Journal of Psychiatry 130(2): 132-140 (February, 1973)

For abstract, see Section IV. Behavioral Studies.

HOLLISTER, L. E. Marihuana in man: Three years later. Science 172: 21-28 (April 2, 1971)

For abstract, see Section II. Drug Chemistry and Metabolism.

HOLLISTER, L. E. and GILLESPIE, H. K. Delta-8- and delta-9-tetrahydrocannabinol. Clinical Pharmacology and Therapeutics 14(3): 353-357 (1973)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

HOLLISTER, L. E., MERLIS, S. and ITIL, T. Newer complications of psychotherapeutic drugs. International Journal of Neuropsychiatry 3(Suppl. 1): 141-148 (August, 1967)

HOLLISTER, L. E. and REAVEN, G. M. Delta-9-tetrahydrocannabinol and glucose tolerance. Clinical Pharmacology and Therapeutics 16(2): 297-302 (August, 1974)

Intravenous doses of 6 mg of delta-9-tetrahydrocannabinol (THC) produced moderately severe marihuana intoxications. Glucose tolerance was impaired, and this deterioration of glucose tolerance was associated with increased plasma levels of growth hormone. Although large doses of marihuana might aggravate diabetes, the rarity of this phenomenon in clinical practice may be due to the lower doses of THC used socially or development of tolerance to this specific pharmacologic effect.

HORITA, A. and HILL, H. F. Hallucinogens, amphetamines and temperature regulation. The Pharmacology of Thermoregulation Symposium, San Francisco, California, 1972. New York: Karger, 1972.

HUANG, P. and SMITH, A. A. Single dose tolerance to meperidine. Committee on the Problems of Drug Dependence. Washington, D. C.: National Academy of Sciences, National Research Council, 1970.

IWATSUBO, K., GOLD, G. J. and CLOUET, D. H. Dopamine-sensitive adenylate cyclase of the caudate nucleus of rats treated with morphine or halope idol. The Pharmacologist 16(2): 270 (1974)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

JARVIK, L. F., YEN, F-S., DAHLBERG, C. C., FLEISS, J. L., JAFFE, J., KATO, T. and MORALISHVILI, E. Chromosome examinations after medically administered lysergic acid diethylamide and detroamphetamine. Diseases of the Nervous System 35(9): 399-407 (September, 1974)

The results of the present study demonstrate once again that, on the average, the addition of LSD in vitro leads to chromosome damage in excess of that observed in cultures without such added LSD even though nearly all of the in vitro experiments were carried out on blood cultures derived from patients who had already been started on the drug regime in vivo.

By contrast, the present data provide no evidence for a measurable detrimental effect of LSD and DA when administered to patients under medical supervision. It is conceivable that an effect might have emerged had we been able to monitor chromosomes separately before and after administration of LSD and before and after administration of DA, but we consider it unlikely that either drug would exert protective action against potentially damaging consequences of the other. It is conceivable also that damaged cells are sequestered to give rise eventually to neoplasia-prone clones. The likelihood of that possibility can be determined only by long-term follow-up studies.

JATLOW, P. I. Analysis of drugs and toxicological agents. Gas Chromotography in Clinical Microbiology and Medicine. Edited by B. Mitruka and R. Kundargi. New York: John Wiley and Sons, 1975. Pp. 396-416.

For abstract, see Section I. Methodology of Drug Research.

JATLOW, P. A rapid ultraviolet spectrophotometric procedure for the analysis of drugs frequently involved in overdose emergencies. Manual of Analytic Toxicology, Vol. 2. Edited by I. Sunshine. Cleveland, Ohio: Chemical Rubber Company Press, Inc., 1971.

JATLOW, P., McKAY, D. and SELIGSON, D. Computer assisted emergency analysis of drugs. Clinical Chemistry 18: 712 (1972)

For abstract, see Section I. Methodology of Drug Research.

JATLOW, P. and SELIGSON, D. Application of a digital computer to emergency toxicology. Clinica Chimica Acta 50: 19-30 (1974)

For abstract, see Section I. Methodology of Drug Research.

JONES, R. Significance and characteristics of drug dependence: Characteristics of drug dependence to cannabis. Chemical and Biological Aspects of Drug Dependence. Edited by S. J. Mule and H. Brill. Cleveland, Ohio: Chemical Rubber Company Press, 1972. Pp. 65-81.

JONES, R. T. and STONE, G. C. Psychological studies of marijuana and alcohol in man. Psychopharmacologia 18(1): 108-117 (1970)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

KARLER, R., CELY, W. and TURKANIS, S. A. A study of the relative anticonvulsant and toxic activities of delta-9-tetrahydrocannabinol and its cogeners. Research Communications in Chemical Pathology and Pharmacology 7(2): 353 (February, 1974)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

KENNEDY, D. K., GRUBB, M. N. and BURKS, T. F. Antagonism of methadone's intestinal effects by cyproheptadine. Gastroenterology 66: 396-402 (1974)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

KENNEDY, J. S. and WADDELL, W. J. Whole-body autoradiography of the pregnant mouse after administration of ^{14}C-delta-9-THC. Toxicology and Applied Pharmacology 22: 252-258 (1972)

For abstract, see Section I. Methodology of Drug Research.

KIPLINGER, G. F. and MANNO, J. E. Dose-response relationships to cannabis in human subjects. Pharmacological Reviews 23(4): 339 (1971)

KRON, R. E., LITT, M. and FINNEGAN, L. P. Behavior of infants born to narcotic addicted mothers. International Journal of Clinical Pharmacology and Therapeutic Toxicology 10(2): 144 (1974)

For abstract, see Section IV. Behavioral Studies.

KRUMHOLTZ, W. V., SHEPPARD, C. and MERLIS, S. Menstruation changes as usual side effect in a molindone trial. Current Therapeutic Research 12(2): 94-96 (February, 1970)

Ten women with chronic mental illness treated with Molindone in doses of 25 to 125 mg. daily during a six-weeks period exhibited no clinical improvement. In addition to exhibiting a variety of side effects, five of ten women demonstrated menstrual irregularities which did not exist prior to this treatment. There is presumptive evidence to suggest a causal relationship of the menstrual irregularities to the administration of Molindone.

LABRECQUE, G. and DOMINO, E. F. Tolerance to and physical dependence on morphine: Relation to neocortical acetylcholine release in the cat. The Journal of Pharmacology and Experimental Therapeutics 191: 189-200 (1974)

LANG, D. W., DARRAH, H. K., HEDLEY-WHYTE, J. and LAASBERG, L. H. Uptake into brain proteins of ^{35}S-methionine during morphine tolerance. The Journal of Pharmacology and Experimental Therapeutics (in press)

LEANDER, J. D., McMILLAN, D. E. and HARRIS, L. S. Schedule induced oral narcotic self-administration. Acute and chronic effects. The Journal of Pharmacology and Experimental Therapeutics (in press)

LEGATOR, M. S., WEBER, E., CONNOR, T. and STOECKEL, M. Failure to detect mutagenic effects of delta-9-tetrahydrocannabinol in dominant lethal, host-mediated assay, blood-urine studies, and cytogenetic evaluation with mice. Presented at the International Conference on the Pharmacology of Cannabis, Savannah, Georgia, December 3-6, 1974.

The uniformly negative results in this comprehensive study would indicate that delta-9-THC when administered orally to mice at concentrations used in this report does not produce measurable genetic damage. These results support the theory that purified delta-9-THC has no genetic effects. Although this study is probably the most comprehensive evaluation of potential mutagenic activity of delta-9-THC reported to date, it should be realized that these studies were limited to the evaluation of the compound in a specific strain of mice and by a single mode of administration by gavage. The genetic effects of this compound have yet to be studied in other animal models. It is also conceivable that if the compound is administered by smoking, the results would be different than that obtained in this study.

LIN, C. H., BRAVERMAN, S., KEINATH, S., TRESK, R. and ADLER, M. W. Anticonvulsant action of acute morphine administration in rats. Federation Proceedings (in press)

McISAAC, W. M. ^{14}C-LSD: Autoradiographic study on the placental transfer and tissue distribution in mice. Science (in press)

McMAHON, E.M., ANDERSEN, D.K., FELDMAN, J.M. and SCHANBERG, S.M. Methamphetamine-induced insulin release. Science 174: 66-68 (1971)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

MAICKEL, R.P., BRAUNSTEIN, M.C., McGLYNN, M., SNODGRASS, W.R. and WEBB, R.W. Behavioral, biochemical, and pharmacological effects of chronic dosage of phenothiazine tranquilizers in rats. The Phenothiazines and Structurally Related Drugs. Edited by I.S. Forrest, C.J. Carr and E. Usdin. New York: Raven Press, 1974.

For abstract, see Section I. Methodology of Drug Research.

MAICKEL, R.P., FEDYNSKYJ, N.M., POTTER, W.Z. and MANIAN, A.A. Tissue localization of 7- and 8-hydroxychlorpromazines. Toxicology and Applied Pharmacology 28: 8-17 (1974)

For abstract, see Section I. Methodology of Drug Research.

MAICKEL, R.P., LEVINE, R.M. and QUIRCE, C.M. Differential effects of d- and l-amphetamine on spontaneous motor activity in mice. Research Communications in Chemical Pathology and Pharmacology 8(4): 711-714 (August, 1974)

For abstract, see Section I. Methodology of Drug Research.

MAICKEL, R.P., ROMPALO, A.M. and COX, R.H.,JR. Differential effects of monoamine oxidase inhibitors. Research Communications in Chemical Pathology and Pharmacology 8(4): 727-730 (August, 1974)

For abstract, see Section I. Methodology of Drug Research.

MAICKEL, R.P. and SNODGRASS, W.R. Physiochemical factors in maternal-fetal distribution of drugs. Toxicology and Applied Pharmacology 26: 218-230 (1973)

The time course of physiological disposition of a variety of drugs has been examined in pregnant rats using radiolabeled compounds and highly specific methods. The results indicate that the placental barrier in rats behaves as a lipoidal barrier towards positively charged and neutral drugs, while negatively charged drugs pass the placental barrier with comparative ease. Localization in fetal tissues is less pronounced than in corresponding maternal tissues for all drugs. Fetal and maternal plasma half-lives are similar for most of the compounds tested.

MANNO, B.R. and MANNO, J.E. 11-hydroxy-delta-9-tetrahydrocannabinol induced changes in the perfused rat heart. Presented at the Meeting of the Society of Toxicology, Williamsburg, Virginia, Spring, 1975.

For abstract, see Section I. Methodology of Drug Research.

MANNO, B.R. and MANNO, J.E. The marihuana dilemma: Has it been resolved? Toxicology Annual. Edited by C.L. Winek. New York: Marcel Dekker, Inc. (in press)

MANNO, B.R. and MANNO, J.E. Some cardiovascular actions of delta-9-tetrahydrocannabinol in the rat. Toxicology and Applied Pharmacology 25: 451 (1973)

For abstract, see Section I. Methodology of Drug Research.

MANNO, J.E., KIPLINGER, G.F., RODDA, B.E., FORNEY, R.B. and MANNO, B.R. Dose-dependent alterations in human motor and mental performance after smoking marijuana cigarettes. Chapter 1 of Drug Addiction: Clinical and Socio-legal Aspects, Vol. II. Edited by J. Singh. Mount Kisco, New York: Futura Publishing Company, 1972. Pp. 3-11.

MANNO, J.E. and MANNO, B.R. Cardiovascular actions of 11-hydroxy-delta-9-tetrahydrocannabinol in the rat. Presented at the Meeting of the Society of Toxicology, Williamsburg, Virginia, Spring, 1975.

For abstract, see Section III. Mechanisms of Action of Different Drugs.

MANNO, J.E. and MANNO, B.R. The interaction of delta-9-tetrahydrocannabinol (THC), pentobarbital and SKF-525A with the cardiovascular system of the rat. Federation Proceedings 32: 755 (1973)

For abstract, see Section I. Methodology of Drug Research.

MANNO, J.E., MANNO, B.R. and KIPLINGER, G.F. Motor and mental performance with marihuana: Relationship to administered dose of THC and its interaction with alcohol. Behavioral Actions of Marihuana. Edited by L.L. Miller. New York: Academic Press (in press)

MANTILLA-PLATA, B. and HARBISON, R.D. Effects of phenobarbital and SKF 525A pretreatment, sex, liver injury, and vehicle on delta-9-tetrahydrocannabinol toxicity. Toxicology and Applied Pharmacology 27: 123-130 (1974)

Phenobarbital (PB) antagonizes and SKF 525A potentiates delta-9-tetrahydrocannabinol (THC)-induced mortality. PB (60 mg/kg/day for 4 days) and SKF 525A (40 mg/kg, 1 hr before THC) alter THC plasma concentration, distribution, and excretion. After ip administration of ^{14}C-labeled THC, ^{14}C was measured in plasma and brain tissue, SKF 525A pretreatment resulted in a significantly higher plasma and brain ^{14}C concentration. PB pretreatment resulted in a slight reduction of plasma and brain ^{14}C concentration. Neither pretreatment significantly alters the total percent of dose excreted, but both treatments resulted in significantly greater ^{14}C excretion in urine when compared to controls. Male mice are more sensitive to THC-induced toxicity than female mice. Carbon tetrachloride and ANIT-induced liver injury produced a significant increase in THC-induced lethality. Presence of liver injury produced a 3- to 5-fold increase in THC-induced lethality when compared to THC alone. THC suspended in Tween 80 and saline is 5 times more toxic than the same dosage administered in an oil solution.

MATEFY, R.E. and KRALL, R.G. An initial investigation of the psychedelic drug flashback phenomena. Journal of Consulting and Clinical Psychology 42: 854-860 (1974)

Many users of psychedelic drugs, especially LSD, report recurrences of the drug effects long after taking the drug. This study provides an initial investigation of some of the characteristics of those persons experiencing such "flashbacks," and provides systematic descriptions of the flashback phenomena. Among the major findings were that the drug user experiencing flashbacks when compared with the drug user not experiencing flashbacks showed no significant differences in psychopathological characteristics as measured by the MMPI nor significant differences in attentional processes as measured by the EFT. There were few biographical differences between the two subject groups. Subjective reports by the flashback subjects offered some revealing details of the flashback experience itself.

MATEFY, R.E. and KRALL, R.G. Psychedelic drug flashbacks: Psychotic manifestations or imaginative role-playing? Journal of Consulting and Clinical Psychology (in press)

MELGES, F.T., TINKLENBERG, J.R., DEARDORFF, C.M., DAVIES, N.H., ANDERSON, R.E. and OWEN, C.A. Temporal disorganization and delusional-like ideation processes induced by hashish and alcohol. Archives of General Psychiatry 30: 855-861 (June, 1974)

From studies of acutely paranoid psychiatric patients, we postulated that temporal disorganization might be involved in the emergence of delusional-like ideation (ie, feelings of influence, grandiosity and persecution). To test this postulate, high doses of tetrahydrocannabinol were used to induce temporal disorganization in carefully screened normal subjects who had no detectable predisposition to delusional ideation. Each subject was used as his own control for five experimental conditions (including comparably intoxicating alcohol doses as well as placebo) at weekly intervals. Tetrahydrocannabinol conditions induced significantly greater temporal disorganization and delusional-like ideation. For all subjects, there were substantial change correlations between temporal disorganization and delusional-like ideation. The findings indicate that changes in the rate, sequence, and goal-directedness of thinking processes were involved in the emergence of unusual thought content.

MELLETT, L.B. and STROBEL, J. An electrophoretic study of acute and chronic drug effects. Bulletin, Problems of Drug Dependence 30: 5376-5391 (1968)

MESHEL, E. and DENBER, H.C. Double-blind study of tybamate in psychotic patients. Diseases of the Nervous System 28: 311-313 (1967)

MEYERS, F.H. Pharmacologic effects of marijuana. Journal of Psychedelic Drugs 1:31-36 (Fall, 1968)

MEYERS, F.H., ROSE, A.J. and SMITH, D.E. Incidents involving the Haight-Ashbury population and some uncommonly used drugs. Journal of Psychedelic Drugs 1:139-146 (1968)

MIDDAUGH, L.D., BLACKWELL, L.A., SANTOS, C.A., III and ZEMP, J.W. Effects of d-amphetamine sulfate given to pregnant mice on activity and on catecholamines in the brains of offspring. Developmental Psychobiology 7(5): 429-438 (1974)

For abstract, see Section IV. Behavioral Studies.

MIDDAUGH, L.D., SANTOS, C.A., III and ZEMP, J.W. Effects of phenobarbital given to pregnant mice on behavior of mature offspring. Developmental Psychobiology (in press)

For abstract, see Section IV. Behavioral Studies.

MILLER, L.L., editor. Marijuana. Effects on Human Behavior. New York: Academic Press, 1974.

For abstract, see Section I. Methodology of Drug Research.

MORETON, J.E. and DAVIS, W.M. Electroencephalographic study of effects of delta-9 and delta-8-tetrahydrocannabinol and cannabis extract on sleep in the rat. The Pharmacologist 13(2): 246 (1971)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

MULE, S.J. and CLOUET, D.H. Pharmacological and biochemical aspects of opiate dependence. Psychopharmacologia 26: 116 (1972)

For abstract, see Section II. Drug Chemistry and Metabolism.

MUSHLIN, B. and COCHIN, J. Effects of irradiation on the development of tolerance to morphine in the rat. Federation Proceedings 33: 502 (1974)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

NADITCH, M.P. Acute adverse reactions to psychoactive drugs, drug usage, and psychopathology. Journal of Abnormal Psychology 83(4): 394-403 (August, 1974)

A field survey method was used to examine the relationship between psychopathology and acute adverse reactions to psychoactive drugs. A paper-and-pencil measure of acute adverse reactions was discussed. Acute adverse reactions were hypothesized to covary positively with regression, schizophrenia, and drug usage, and to covary negatively with adjustment and paranoia. These hypotheses were supported. Usage of LSD and mescaline was hypothesized to covary positively with regression and covary negatively with adjustment; these hypotheses were supported. A hypothesis that schizophrenia would positively covary with LSD and mescaline usage was not confirmed. Regression was also found to be related to marijuana usage. A recursive linear model is developed in an attempt to integrate and explain these results.

NADITCH, M. P. Ego functioning and acute adverse reactions to psychoactive drugs. Journal of Personality (in press)

The relationship between ego functioning and acute adverse reactions to psychoactive drugs was examined using retrospective data. The data were consistent with a causal model in which characteristic use of regression (and to a lesser extent repression) was associated with acute adverse reactions to marijuana and to LSD. Regression also had an indirect effect through increased usage of LSD. Subjects characterized by the use of intellectualization and denial were less likely to report developing acute adverse reactions. A higher score on a general measure of coping was related to avoiding acute adverse reactions to LSD, but not to marijuana. Projection regression in the service of the ego, and tolerance of ambiguity has no effect on acute adverse reactions.

NADITCH, M. P. The relation of motives for drug use and psychopathology in the development of acute adverse reactions to psychoactive drugs. Journal of Abnormal Psychology (in press)

The relationship between motives for drug use, the degree of drug usage, psychopathology, and acute adverse reactions to marijuana and LSD were examined using retrospective data. Three dimensions of motives were identified: use for pleasure, use with therapeutic intent, and reluctant use as a response to peer pressure. Use of drugs with therapeutic intent and as a response to peer pressure were related to the development of acute adverse reactions, even after partialling out shared variance with other motives, the extent of usage and the measures of psychopathology considered in the analysis. A causal model of the relationships between psychopathology, motives for use, the extent of usage and acute adverse reactions was developed using path analysis procedures.

NADITCH, M. P., ALKER, P. C. and JOFFE, P. Individual differences and setting as determinants of acute adverse reactions to psychoactive drugs. Journal of Nervous and Mental Disease (in press)

The relationship between setting and individual differences in determining acute adverse reactions to psychoactive drugs was examined using retrospective data from 483 drug users. Five dimensions of setting were identified.

Although there were some small setting main effects, these effects failed to reach significance when shared variance with individual difference variables was considered. For acute adverse reactions to LSD, however, there were seven independent interaction effects between setting and individual difference variables, two of which were larger in magnitude than any main effects. There were two interaction effects of smaller magnitude related to acute adverse reactions to marijuana. The significance of these results for the current controversy over the relative importance of situational versus personality determinants of behavior was discussed.

NICHOLS, W. W., MILLER, R. C., HENEEN, W., BRADT, C., HOLLISTER, L. and KANTER, S. Cytogenetic studies on human subjects receiving marihuana and delta-9-tetrahydrocannabinol. Mutation Research 26: 413-417 (1974)

Cytogenetic analysis of metaphase chromosomes from peripheral blood leukocyte cultures of volunteer male subjects sampled before and after a series of oral applications of marihuana extract, hashish extract, or synthetic delta-9-THC revealed no increase in chromosome breakage which could be attributed to the effects of these compounds.

NICHOLSON, M. T., PACE, H. B. and DAVIS, W. M. Effects of marijuana and lysergic acid diethylamide on leukocyte chromosomes of the golden hamster. Research Communications in Chemical Pathology and Pharmacology 6(2): 427 (September, 1973)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

NORTH, R. B., HARIK, S. I. and SNYDER, S. H. Amphetamine isomers: Influences on locomotor and stereotyped behavior of cats. Pharmacology Biochemistry and Behavior 2: 115-118 (1974)

Catecholamine release and reuptake are considerably more stereoselective at norepinephrine than at dopamine nerve terminals, suggesting that pronounced differences in the influence of amphetamine isomers on particular behaviors favors norepinephrine mediation while similar actions of these isomers indicates a predominant role for dopamine. (+)-Amphetamine is markedly more potent than its (-)-isomer in stimulating locomotor activity of the cat while the two isomers differ less in provoking stereotyped behavior. These findings support a major role for brain norepinephrine in mediating amphetamine-induced locomotor enhancement, while dopamine may be more important in facilitating stereotyped behavior. Besides inducing stereotyped behavior, L-Dopa greatly enhances locomotor activity, which suggests an important role for dopamine in mediating locomotor activation.

PACE, H. B., DAVIS, W. M. and BORGEN, L. A. Teratogenesis and marijuana. Annals of the New York Academy of Sciences 191: 123-131 (December, 1971)

PEARSON, J., BADEN, M. B. and RICHTER, R. W. Neuronal depletion in addicts. Report of the Thirty-Sixth Annual Scientific Meeting, Committee on Problems of Drug Dependence, Mexico City, March 10-14, 1974. Washington, D.C.: National Academy of Sciences, National Academy of Engineering, National Research Council, 1974.

Decreased neuronal population densities are described in the globus pallidus of narcotic addicts. Toxicologic studies indicate mixed addiction to be frequent but exposure to parenteral heroin is the only common factor. This permanent brain damage seems more likely to be caused by recurrent episodes of hypoxia during severe reactions to narcotics than to be related to direct neurotoxic effects of heroin. The lesion may account for some of the long term changes observed in addicts.

PEARSON, J. and RICHTER, R. W. Neuropathological effects of opiate addiction. Medical Aspects of Drug Abuse. Edited by R. W. Richter. Hagerstown, Maryland: Harper and Row, Publishers, 1975.

PEARSON, J., RICHTER, R.W., BADEN, M.M., CHALLENOR, Y.B. and BERTEL, B. Transverse myelopathy as an illustration of the neurologic and neropathologic features of heroin addiction. Human Pathology 3(1): 107-113 (March, 1972)

A case history is presented of transverse myelopathy occurring in a 33 year old male heroin addict soon after the injection of heroin. There were degenerative changes in the globi pallidi, loss of astrocytes from the deep white matter, a vascular malformation in the cerebellum, old necrosis with cystic change in the spinal cord gray matter, minimal damage to the long white tracts of the cord, peripheral myelin axons in cord cysts; and neurogenic atrophy and siderosis in the skeletal muscle. These changes represent many of the characteristic findings typical of the transverse myelopathy found in heroin addicts. That a causal relationship exists between the injection of adulterated heroin and the rapid development of transverse myelopathy can no longer be doubted. Despite clinical evidence of severe localized cord insult, marked clinical recovery is the rule in these cases. Ischemic and anoxic mechanisms have been implicated as etiological factors in transverse myelopathy, as has hypersensitivity to the injected components of the adulterated heroin used by addicts. No real proof has been found to substantiate these hypotheses. Thus the cause of the syndrome in heroin addicts remains to be elucidated.

PETERS, M.A. Studies on the time course distribution of methadone in the pregnant, nonpregnant, male and fetal rat. Proceedings of the Western Pharmacological Society 16: 70-76 (1973)

PILLARD, R.C. Medical progress. Marihuana. New England Journal of Medicine 283: 294-303 (August, 1970)

RANDRUP, A. and MUNKVAD, I. Behavioural toxicity of amphetamines studied in animal experiments. The Correlation of Adverse Effects in Man with Observations in Animals. Edited by S.B. de Baker. Amsterdam, the Netherlands: Excerpta Medica Foundation, 1971.

The behavioural stimulation of animals brought about by amphetamines is selective; certain activities (items of behaviour) are increased and others simultaneously decreased. With increasing doses of amphetamine this leads to an extremely stereotyped activity consisting of continuous repetition of one or a few items of behaviour.

The selective stimulation causes impairment of the functional capacity of the animals e.g. by derangements of operant and social behaviour.

Possible human-animal correlations and implications for the clinic (amphetamine addiction, schizophrenia) are discussed.

The biochemical actions of amphetamine underlying the behavioural effects are not discussed here, but reference is made to recent reviews by the authors published elsewhere.

RANDRUP, A. and MUNKVAD, I. Influence of amphetamines on animal behaviour. Stereotypy, functional impairment and possible animal-human correlations. Psychiatria, Neurologia, Neurochirurgia 75: 193-202 (1972)

For abstract, see Section IV. Behavioral Studies.

RAYE, J.R., DUBIN, J.W. and BLECHNER, J.N. Fetal growth restriction following maternal narcotic administration: Nutritional or drug effect? The Society for Pediatric Research (in press)

Intrauterine growth retardation has been observed in 25-45% of infants born to narcotic addicted mothers. The relative roles of maternal nutrition and narcotic drug effect are unclear. Rabbits treated with morphine (50 to 100 mg/kg/d s.c.) 1 week prior to conception and throughout gestation were pair fed with weight matched controls. At 29d litters were delivered surgically and measurements made of fetal weight, length, organ weight, protein and DNA. A 2 way analysis of variance was performed.

Significant reductions in mean fetal growth were seen in both the 50 mg/kg ($p < .01$) and the 100 mg/kg ($p < .001$) groups when compared to their pair fed controls. Decreases in forebrain (FB) weight were particularly striking. When compared to the 50 mg/kg group, the 100 mg/kg group showed significant additional growth restriction ($p < .001$). Ad lib fed control offspring were not significantly larger than food restricted control offspring.

(Mean±1SD)	50 mg/kg	Control	100 mg/kg	Control	Ad lib
Weight (gm)	30.3±8.2	35.6±7.4	26.9±7.2	40±9.3	35.4±6.5
Length (cm)	10.5±.9	10.9±.9	10.2±.9	11.0±9.3	11.0±.8
FB Wt. (gm)	.56±.04	.60±.06	.53±.09	.64±.06	.61±.05

These data show that chronic maternal morphine administration in the rabbit leads to significant reductions in fetal growth that are not secondary to decreased maternal food intake. This effect appears to be dose dependent.

RICHTER, R.W. and PEARSON, J. Heroin addiction related neurological disorders. Medical Aspects of Drug Abuse. Edited by R.W. Richter. Hagerstown, Maryland: Harper and Row, Publishers, 1975.

RICHTER, R.W., PEARSON, J., BRUUN, B., CHALLENOR, Y.B., BRUST, J.C.M. and BADEN, M.M. Neurological complications of addiction to heroin. Bulletin of the New York Academy of Medicine 49(1): 3-21 (January, 1973)

This presentation has focused on the neurological findings observed in heroin addicts. The social and therapeutic aspects of addiction must not be overlooked. Treating the overdosed patient or the patient who has an interesting neurological complication is totally insufficient if it is not coupled with simultaneous concern to ensure adequate rehabilitation and restoration. The need of the addict to recognize his intrinsic potential as a human being has been emphasized increasingly. In response to this recognition and to the desire on the part of an addict for help, a responsibility falls on all health professionals to provide the necessary avenues of treatment in all dimensions--social and rehabilitative as well as medical. We can no longer ignore this broad responsibility.

This responsibility is all the more crucial in a community such as Harlem, where addiction to heroin and its complications contribute such a large component to other medical illnesses. The neurology service staff cooperates actively with the various programs of treatment and rehabilitation for heroin addicts, including the Methadone Maintenance Program. Group meetings are held that utilize, among other techniques, peer-group counseling. From the humane standpoint alone, it is necessary to prevent further exposure to the heroin-quinine adulterant mixtures which may precipitate neural disability. Patients who are addicts must be referred to a suitable treatment facility prior to discharge from the hospital for their acute illness. Over-all results are still limited, but evidence indicates that recovery from addiction is possible. An example is a heroin addicted patient who was treated successfully for tetanus. His recovery was so complete that he became an oxygen therapist in the very recovery room where he himself had been a patient.

Since addiction to heroin is a major health problem in the community, further support must be given for establishment of truly community-based and community-oriented programs of prevention, education, and treatment. Active research programs defining the basic mechanisms in the addictive states must accompany various therapeutic approaches.

ROSENBERG, H.C. and OKAMOTO, M. A method for producing maximal pentobarbital dependence in cats: Dependency characteristics. Drug Addiction: Neurobiology and Influences on Behavior, Vol. 3. Edited by J.M. Singh H. Lal. New York: Stratton Intercontinental Medical Book Company, 1974.

For abstract, see Section I. Methodology of Drug Research.

ROSOW, C., MILLER, J., PELIKAN, E. and COCHIN, J. The effect of ambient temperature on morphone-induced temperature change in the mouse. The Pharmacologist 15: 202 (1973)

Administration of morphine produces poikilothermia in the mouse. Previous experiments may have obscured this effect by controlling ambient temperature and using temperature change as the dependent variable. Male mice (25-30 g) were restrained and body temperature was monitored continuously for 2 hours. Morphine sulfate (MS) or distilled water (.01 cc/g) was injected s.c., and temperature was recorded for 3 more hours. Ambient temperatures varied from 21 to 27.5° C. on any given day. Mice given distilled water or 5 mg/kg MS showed little temperature change regardless of ambient temperature. Mice given 10 and 20 mg/kg MS acutely or chronically showed significant correlation between body temperature at the time of peak effect and ambient temperature (the regression coefficient approximated 1). Hypothermia was seen at ambient temperatures below approximately 24° C. and hyperthermia above. These results indicate that morphine may act to decrease the capacity of the mouse to regulate internal temperature, rather than to cause hypo- or hyperthermia per se.

SANDERS-BUSH, E., BLUMBERG, J.B. and SULSER, F. Biochemical effects of chlorinated amphetamine derivatives. Psychopharmacologia 26(Supplement): 34 (1972)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

SBORDONE, R.J. and CARDER, B. Mescaline and shock induced aggression in rats. Pharmacology, Biochemistry and Behavior (in press)

Rats treated with 10 mg or 50 mg of mescaline/kg fought more than controls in a shock-induced aggression situation. At the higher dosage, the fighting was quite vicious and sometimes lethal. Further data indicated that the effects of mescaline on fighting were not a result of postural changes. It was proposed that mescaline serves both to increase aggressive drive and to block the inhibition of aggression normally caused by the assumption of a submissive posture by the victim.

SCHUSTER, C.R. and VILLARREAL, J.E. The experimental analysis of opioid dependence. Psychopharmacology: A Review of Progress, 1957-1967. Edited by D. Efron, J. Cole, J. Levine and J.R. Wittenburn. Washington, D.C.: U.S. Government Printing Office, 1968. Pp. 811-828.

SEGAL, M. and COCHIN, J. Delta-9-tetrahydrocannabinol (delta-9-THC) - imipramine interaction on mouse body temperature. The Pharmacologist 16: 282 (1974)

The effects of many centrally active agents on body temperature are known to be dependent on ambient temperatures. It has been shown (Haavik and Hardman, JPET, 187:568, 1973) that delta-9-THC induced hypothermia at 20°C and had no effect on temperature at 30°C. We found that at 30°C, imipramine (Im), (10 mg/kg, s.c.) induced hyperthermia and at 20°C it induced hypothermia. We were interested in studying the possible interation of Im and delta-9-THC at varying ambient temperatures. Mice were placed in a controlled temperature chamber and were given delta-9-THC one hour before Im. At 30°C the Im-induced hyperthermia was blocked by delta-9-THC (2 and 8 mg/kg s.c.); at 20°C the Im-induced hypothermia was enhanced by delta-9-THC (2 mg/kg, s.c.). The anomalous results that have been reported in relationship to delta-9-THC in antidepressant screening in rats and mice may well be due to the lack of control of ambient temperatures. The interaction between delta-9-THC and imipramine at controlled ambient temperature may shed some light on the mechanism of impramine's action on temperature.

SEGELMAN, A.B. and SEGELMAN, F.P. Possible noninhibition of cellular-mediated immunity in marihuana smokers. Science 185: 543-544 (August, 1974)

SEGELMAN, A.B. and SOFIA, R.D. Cannabis sativa L. (marijuana) IV: Chemical basis for increased potency related to novel method of preparation. Journal of Pharmaceutical Sciences 62(12): 2044-2046 (December, 1973)

Recent reports from the drug subculture in this country indicate that the simultaneous use of marijuana teas together with smoking previously boiled marijuana plant material results in more profoundly experienced psychotropic effects. It was found that the boiling water treatment of marijuana removes water soluble materials equivalent to 30% of the weight of the plant material, thus leading to marijuana correspondingly enriched in cannabinoids, including (-)-trans-delta-9-tetrahydrocannabinol, one of the major psychoactive compounds present in the plant. This finding explains, in part, the reputed increased pharmacological effects resulting from this newly described method of marijuana use. Moreover, the potential dangers inherent in the described method are discussed.

SHAGASS, C. Effects of LSD on somatosensory and visual evoked responses and on the EEG in man. Recent Advances in Biological Psychiatry 9: 209 (1967)

SHAGASS, C. Invited discussion of Drs. M. Fink and T. Itil's paper: Evoked response and behavioral effects of LSD and ditran. Pharmacology: A Review of Progress, 1957-1967. Edited by D.H. Efron. Washington, D.C.: PHS Publication No. 1836, 1969.

SHEPPARD, C. and MERLIS, S. Drug induced extrapyramidal symptoms: Their incidence and treatment. American Journal of Psychiatry 123: 886 (January, 1967)

The question of side effects concurrent with treatment for psychological symptomatology has received added attention in the past decade. The search for chemical structures which provide therapeutic change while producing limited side effects continues. So to does the investigation of the incidence of untoward effects with current psychoactive medications.

The authors survey the incidence of extrapyramidal symptoms at a large (census 11,182) psychiatric hospital. In previous studies a high percentage of symptom remission has been adequately demonstrated. Therefore, it is unlikely that the data reported on extrapyramidal symptoms was related to inadequate dosage.

Five percent (378) of a total of 7,110 patients receiving psychotropic therapy received antiparkinson medication. The empirical evidence reported indicated a sex difference (3:1 females). Different "clusters" of extrapyramidal symptoms were elicited by different drugs. It was suggested that these differences may cut across chemical structure. The incidence of side effects seems to be related more to dosage and chemical structure than to a possible psychodynamic interpretation of the patients adjustment to psychophysiological changes induced by the treatment regimen. Nonetheless, in a total treatment program these symptoms should not be ignored. They have meaning to the patient, to the therapist-patient relationship, to the ward staff and to the total ward milieu.

Effective treatment was achieved by adding anyone of four antiparkinson medications to the therapy regimen. Ninety -seven percent of the patients treated improved (38% completely, 35% moderately, 24% some and 3% no improvement). Two tables were included. One summarized the antipsychotic drugs, their dosage regimen, incidence and type of most frequent extrapyramidal effect by sex. The second gave the antiparkinson agents used, their median daily dose and dosage range.

SHOURARE, Z., FINNEGAN, L.P., REESER, D.S., PAEZ, P.D. and SHAFFER, T.H. Early pulmonary function studies of infants born to opiate dependent mothers. Pediatric Research (in press)

SHUSTER, L., WEBSTER, G.W., YU, G. and ELEF-THERION, B.E. A genetic analysis of the response to morphine in mice: Analgesia and running. Psychopharmacologia (in press)

SIVA SANKAR, D.V., ROZSA, P.W. and GEISLER, A. Chromosome breakage in children treated with LSD-25 and UML-491. Comprehensive Psychiatry 10(5): 406-409 (September, 1969)

The percentage of chromosome breakage was studied using 57 child psychiatric patients and eight non-hospitalized, non-drug treated volunteer controls. Out of this, there were 15 subjects who received LSD-25, nine who received UML-491 and eight who received both the drugs. The per cent breakage in seven adults was 0.57 per cent and in 25 control children was 0.68. The per cent chromosome breakage in the children treated with LSD-25 and/or UML-491 ranged from 0.56 to 1 per cent. These differences, however, are not statistically significant. It is concluded that treatment with LSD-25 had no long lasting effects on human leukocyte chromosomes in child psychiatric patients.

SMITH, A. A. Adrenergic regulation of the lenticular response to opioids in mice. The Addictive States, Vol. XLVI. Baltimore, Maryland: The Williams and Wilkins Company, 1968.

For abstract, see Section III. Mechanisms of Action of Different Drugs.

SMITH, A. A. Anamnestic response to an opioid. Experientia 27: 542 (1971)

SMITH, A. Narcotic antagonists. Narcotic Drugs: Biochemical Pharmacology. Edited by D. H. Clouet. New York: Plenum Press, 1971.

SMITH, A. A. Potentiation of opioid-induced cataracts by catecholamines injected into the mouse brain. Psychopharmacologia 16: 313-317 (1970)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

SMITH, A. A. and HUI, F. W. Inhibition of neurotrophic activity in salamanders treated with opioids. Experimental Neurology 39(1): 36 (1973)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

SMITH, A. A., HUI, F. and CROFFORD, M. Inhibition of growth by methadone and other cholinolytic drugs. Annals of the New York Academy of Sciences 228: 338-343 (March, 1974)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

SOKOL, G. H. and MAICKEL, R. P. Toxic interactions of d-amphetamine and tricyclic antidepressants in mice. Research Communications in Chemical Pathology and Pharmacology 3(3): 513 (May, 1972)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

SOLISH, G., FEINGOLD, E. and HARPER, R. G. Chromosomal studies of methadone-maintained women and their newborns. Society for Pediatric Research (in press)

The effect of methadone on chromosomal structure has not been sufficiently studied. We assessed the peripheral blood chromosomes in: (1) 12 pregnant women maintained on methadone doses of 10 to 60 mg per day throughout pregnancy; (2) 4 pregnant women maintained on methadone until the 28th week of gestation, then becoming drug-free until delivery; (3) 9 pregnant women matched for age, race, and parity, who took no drug during pregnancy. Frequent urines for drug-abuse screening were obtained from all women. No mother was included with medical or obstetrical complications. Cord blood chromosomes were studied in all 25 infants. Twenty metaphase spreads per subject were analyzed for chromosome number and aberrations (gaps, breaks, fragments, dicentrics, deletions, additions, rings). No significant difference was found between the 3 groups of mothers or between the 3 groups of infants, either in chromosome number or total number of chromosomal aberrations. These data allow us to infer that methadone taken during pregnancy does not alter the cytogenetic status of the mother or infant.

SOSKIN, W., Children of the Good Life. A Second Interim Report on Project Community, Berkeley, California, March, 1972.

SOULE, A.B., STANDLEY, K., COPANS, S.A. and DAVIS, M. Clinical uses of the Brazelton neonatal scale. Pediatrics 54(5): 583-586 (November, 1974)

For abstract, see Section IV. Behavioral Studies.

SPECTOR, M. Chronic vestibular and auditory effects of marijuana. The Laryngoscope 84(5): 816-820 (May, 1974)

The objective of this study was to ascertain vestibular dysfunction and impaired hearing resulting from the chronic use of marijuana. Electronystagmography was utilized to record gaze nystagmus, tracking a pendulum, spontaneous nystagmus, positional nystagmus, and rotation on the torsion swing. Pure tone thresholds were also obtained. The results of these tests, for normals and heavy marijuana users, were then compared. The comparison of these results showed significant changes in vestibular functions for chronic marijuana users in: a. decrease in maximum amplitude on torsion swing; b. increase in incidence of nystagmus in two or more supine positions; and c. decrease in speed of slow component on caloric tests.

STEELE, W.J. and JOHANNESON, T. Effects of morphine infusion in maternal rats at near term on ribosome size distribution in foetal and maternal rat brain. Acta Pharmacologia et Toxicologia (in press)

STEELE, W.J. and JOHANNESON, T. Effects of prenatally administered morphine on brain development and resultant tolerance to the analgesic effect of morphine in offspring of morphine treated rats. Acta Pharmacologia et Toxicologia (in press)

STOLMAN, S. and ASTON, R. Relationship of barbital disposition to auto-induced hypersusceptibility in the rat. Biochemical Pharmacology 19: 595-601 (1970)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

STOLMAN, S. and ASTON, R. The role of anoxia and hypercarbia in induced hypersusceptibility to barbital. Archives internationales de Pharmacodynamie et de Therapie 180(1): 40 (July, 1969)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

Student Association for the Study of Hallucinogens, Inc. STASH fact sheet on DOM ("STP"). Grassroots (July, 1972 supplement)

Student Association for the Study of Hallucinogens, Inc. STASH Notes: A mini-review of the 1973 marijuana literature, Part I. STASH Capsules 6(2) (March-April, 1974)

Student Association for the Study of Hallucinogens, Inc. STASH notes: A mini-review of the 1973 marijuana literature, Part II. STASH Capsules 6(3) (May-June, 1974)

Student Association for the Study of Hallucinogens, Inc. STASH notes: The adverse effects of amphetamines. STASH Capsules 6(1) (March, 1974)

TING, R., KELLER, A., BERMAN, P. and FINNEGAN, L. P. Follow-up studies of infants born to methadone-dependent mothers. Proceedings of the First International French, Canadian and American Congress on Toxicology, Montreal, Canada, August, 1974.

Twenty-five infants born to methadone-dependent mothers were studied between 6 and 41 months of age for growth, developmental, behavioral and neurological status. Fifty infants of non-drug-dependent mothers of similar socioeconomic backgrounds served as controls. Weight was less than 3rd percentile in 8% of methadone infants and 2.6% of controls (p=0.10) while 26% of methadone infants were less than 3rd percentile in height in contrast to none in the control group (p less than 0.001). Head circumferences were all with $\pm$ 2 S D. Gesell's developmental schedule showed a mean D.Q. in the study group of 100 (S D $\pm$ 8.8) and in the control group 102(S D $\pm$ 10.5). There was no significant difference in gross and fine motor, adaptive, personal-social and language behavior between the two groups. Behavior profiles were scored by assigning grades 1 (decreased) to 5 (increased behavior). In the methadone group there was a marked shift toward high scores; the control group profiles were normal. This behavior pattern decreased in intensity and frequency as the children reached 2 years of age. Neurologic examinations were all normal. In conclusion, children born to methadone-dependent mothers as compared to controls show: decreased linear growth under $3\frac{1}{2}$ years of age, behavior characterized by increased activity and intensity of response in the first 18 months of life, and no differences with regard to developmental and neurological status.

TINKLENBERG, J.R., MELGES, F.T. and HOLLISTER, L.E. Marihuana and memory. Psychopharmacology Bulletin 7(4): 20 (1971)

For abstract, see Section IV. Behavioral Studies.

UYENO, E.T. Delta-9-tetrahydrocannabinol administration during pregnancy of the rat. Proceedings of the Western Pharmacological Society 16: 64-67 (1973)

UYENO, E.T. Effects of delta-9-tetrahydrocannabinol in the viability and behavioral development of the rat. Committee on Problems of Drug Dependence. Washington, D.C.: National Academy of Sciences, National Academy of Engineering, National Research Council, 1973.

UYENO, E.T. Effects of lysergic acid diethylamide on the pregnancy and reproduction of the rat. Fifth International Congress on Pharmacology, San Francisco, California, July 23-28, 1972.

Our previous study (Reported to the Committee on Problems of Drug Dependence, Feb. 16-18, 1970, Washington, D.C.) has shown that a considerable number of rats, administered a single dose (2-6 mg/kg) of lysergic acid diethylamide (LSD-25) on the fourth day of gestation, produced no offspring. In the first and second experiments of the present study a single dose (4-8 mg/kg) of LSD-25 was injected subcutaneously on the sixth and eighth day, respectively. In the third dose-response experiment a single dose of (15-25 mg/kg) of LSD-25 was administered on the tenth day. In each experiment the percentages of females that produced no offspring, were calculated at each dose level and plotted against dose on logarithmic probability paper. The dose-response curves show that the disrupting effect of LSD-25 on reproduction is dose-related. The median effective doses (ED_{50}'s), estimated from the data of the first, second, and third experiments, are 4.01, 9.39, and 34.80 mg/kg, respectively. In the third experiment the percentages of abnormal offspring born of the treated females were significantly greater than those born of the control females.

UYENO, E.T. Effects of prenatally administered lysergic acid diethylamide on the viability and behavioral development of rat offspring. Committee on Problems of Drug Dependence. Washington, D.C.: National Academy of Sciences, National Research Council, 1970. Pp. 6550-6554.

UYENO, E.T. Lysergic acid diethylamide administered to pregnant rats. Hospital Formulary Management 6(3): 15-17 (March, 1971)

UYENO, E.T. Lysergic acid diethylamide in gravid rats. Proceedings of the Western Pharmacological Society 13: 200-203 (1970)

Alexander et al. (1967) reported that a single dose of 5 mu-g/kg of lysergic acid diethylamide (LSD-25) administered subcutaneously on the fourth day of gestation to Wistar rats produced abnormalities in the offspring.

In the present study we have initially repeated their work and then extended it to investigate the behavioral development of the surviving offspring. A dose-response experiment was conducted to evaluate the effects of not only the same dose, but also a higher and lower dose than the dose administered by these investigators. It was conceivable that prenatal administration of LSD-25 might produce subtle "malformations" in the central nervous system of the offspring. Since these "anomalies" might be manifested in "abnormal" behavior during maturation and growth, we have examined the learning ability and social dominance behavior of the surviving offspring at various stages of development.

VOLAVKA, J., CROWN, P., DORNBUSH, R., FELDSTEIN, S. and FINK, M. EEG, heart rate and mood change ("high") after cannabis. Psychopharmacologia 32: 11-25 (1973)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

VOSS, E.W., JR., BABB, J.E., METZEL, P. and WINKELHAKE, J.L. In vitro effect of d-lysergic acid diethylamide on immunoglobulin synthesis. Biochemical and Biophysical Research Communications 50(3): 950 (1973)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

VOSS, E.W., JR., METZEL, P. and WINKELHAKE, J.L. Incorporation of a lysergic acid diethylamide intermediate into antibody protein in vitro. Molecular Pharmacology 9(3): 421-425 (May, 1973)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

VOSS, E.W., JR. and WINKELHAKE, J.L. Mechanisms of lysergic acid diethylamide interference with rabbit antibody biosynthesis. Proceedings of the National Academy of Sciences 71(4): 1061-1064 (April, 1974)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

WAJDA, I.J., WAJDA, S.H., MANIGAULT, I. and STEINER, L. Morphine-induced neurochemical and morphological changes in the corpus striatum and the choroid plexus of rats. Federation Proceedings 33(3): 1568 (March, 1974)

After a single injection of morphine base (30 mg/kg), female Sprague-Dawley rats were decapitated at different time intervals ranging from 30 min to 16 h. The concentration of norepinephrine (NE), dopamine (DA) and acetylcholine (ACh) and the activity of tyrosine hydroxylase were determined in the corpus striatum. Histologic studies of the choroid plexus after acute and chronic morphine treatment were performed. Decreases in NE and DA levels were noticed 2 h and 1 h respectively after morphine injections. Slow return to normal within 4 h, followed in the case of NE, and slight increase in DA levels were found at this time. After 16 h both NE and DA levels were normal. Changes in ACh levels were much more pronounced and did occur earlier (42% increase within 1 h). Tyrosine hydroxylase activity was higher than normal 1 h after morphine, returned to normal within 3 h, and was slightly increased 4 h after the injection. Observed fluctuations in striatal neurotransmitters suggest an earlier and stronger effect of morphine on the cholinergic system. In chronically treated rats, histologic examination of the choroid plexus revealed an increased vacuolization of both the nuclei and the cytoplasm of the ependymal cells, suggesting an increased secretory activity.

WEBSTER, J.B., COUPAL, J.J. and CUSHMAN, P. Increased serum thyroxine levels in euthyroid narcotic addicts. Journal of Clinical Endocrinology and Metabolism 37(6): 928-934 (December, 1973)

Twenty-two percent of 285 untreated, nongoitrous euthyroid narcotic addicts had serum thyroxine (T_4) levels above the upper limits of normal. The serum triiodothyronine (T_3) resin uptake was below the lower limits of normal in either 57% or 25% of the subjects depending on the assay method used. The mean thyroxine-binding globulin binding capacity in a small sample was significantly above that in a group of nonaddicts but within the normal range. Both absolute free thyroxine, when measured, and the free thyroxine index were normal in this 80% male population. There was no correlation of abnormal thyroid function with the history of specific drugs abused and there was no clinical evidence of hyperestrogenism. It appeared that successful methadone treatment was accompanied often by a return towards normal of T_4 levels and T_3 uptake. Thirty-six chronic methadone maintained patients had essentially normal T_4 measurements, and the T_3 resin uptake was normal in all in whom it was measured. Narcotic addiction may result in abnormalities of thyroxine transport which may produce distortions in some commonly used thyroid function tests.

WEI, E., LOH, H.H. and WAY, E.L. Quantitative aspects of precipitated abstinence in morphine-dependent rats. The Journal of Pharmacology and Experimental Therapeutics 184(2): 398-403 (1973)

For abstract, see Section I. Methodology of Drug Research.

WEI, E. and WAY, E.L. Application of the pellet implantation technique for the assessment of tolerance and physical dependence in the rodent. Methods of Narcotic Research. Edited by S. Ehrenpreis and A. Neidle. New York: Marcel Dekker, Inc., 1974.

WEISS, B. Tools for the assessment of behavioral toxicity. Behavioral Toxicology: Early Detection of Occupational Hazards. Edited by C. Xintaras, B.L. Johnson and I. deGroot. Washington, D.C.: U.S. Government Printing Office, 1974. Pp. 444-449.

WEISS, B. and LATIES, V.G. Behavioral pharmacology and toxicology. Annual Review of Pharmacology 9: 297-326 (1969)

For abstract, see Section IV. Behavioral Studies.

WINKELHAKE, J.L., VOSS, E.W., JR. and LOPATIN, D.E. Comparative inhibitory action of d- and l-tryptophan on the effect of d-lysergic acid diethylamide in vitro. Molecular Pharmacology 10(1): 68 (1974)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

WOOD, R.W., WEISS, A.B., and WEISS, B. Hand tremor induced by industrial exposure to inorganic mercury. Archives of Environmental Health 126: 249-252 (May, 1973)

Hand tremor induced by industrial exposure to inorganic mercury vapor was studied during recovery in two women patients. Subjects were instructed to maintain a force with the forefinger between two limits (10 to 40 gm). Performance progressively improved after the cessation of exposure, and were asymptomatic in about 3.5 months. The dispersion of the amplitude distribution decreased, and percent time within the specified limits increased. Power spectral analyses revealed a marked reduction in power associated with a change in the shape of the spectra. These changes were associated with a reduction in plasma levels of mercury.

YANAGITA, T. Development of tolerance and physical dependence to barbiturates in rhesus monkeys. Committee on Problems of Drug Dependence. Washington, D.C.: National Academy of Sciences, National Research Council, 1968. P. 5618.

ZEMP, J.W. and MIDDAUGH, L.D. Some effects of prenatal exposure to d-amphetamine sulfate and phenobarbital on developmental neurochemistry and on behavior. International Journal of Addictive Diseases (in press)

For abstract, see Section IV. Behavioral Studies.

ZIMMERMANN, E., YOUNG, J., BRANCH, B., TAYLOR, A.N. and PANG, C.N. Long-lasting effects of prepuberal administration of morphine in female rats. Narcotics and the Hypothalamus. Edited by E. Zimmermann and R.George. New York: Raven Press, 1974.

For abstract, see Section III. Mechanisms of Action of Different Drugs.

ZIMMERMANN, E., YOUNG, J., BRANCH, B., TAYLOR, A.N., PANG, C.N. and SAWYER, C.H. Long lasting effects of prepuberal administration of morphine in female rats. Journal of Steroid Biochemistry 5: 387 (1974)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

VI

Drug Use/Abuse

Prevention

VI. Drug Use/Abuse Prevention

BAKER W.W., LALLEY, P.M. and YOUNG, R.L. Biphasic effects of intracaudate morphine on caudate functioning. Federation Proceedings 33: 293 (1974)

After a short latency (approximately 17 min) intracaudate (i.c.) injection of small doses (11 mu-g) of morphine partially or totally depressed tremors previously established with i.c. physostigmine (increased levels of endogenous acetylcholine). Inhibition of these ongoing cholinergic tremors developed progressively. Suppressed tremor activity was temporarily reestablished by supplemental i.c. acetylcholine (7.5 mu-g). By contrast, in untreated preparations (absence of tremor) intense tremor responses of long duration (greater than 5 hours) developed at significantly higher (greater than 50 mu-g) doses of morphine. The intensity and duration of these morphine tremors increased with dose and were cumulative. Although i.c. acetylcholine had no effect on these morphine tremors, local scopolamine (100 mu-g) and hemicholinium (120 mu-g) both abolished this activity. Dopamine (67 mu-g) and Ca^{++} (32 mu-g) also readily suppressed morphine tremor. Our findings indicate that morphine biphasically alters caudate functioning and suggest the following interpretations: at low doses the morphine depressed the release of acetylcholine; and at higher doses it is tremorgenic, interfering with the stabilizing action of local dopamine.

BAKER, W.W., YOUNG, R.L. and KRATKY, M. Acute effects of hydromorphone on chemically-induced repetitive discharges in the hippocampus. Archives internationales de Pharmacodynamie et de Therapie 207: 57-68 (1974)

The acute effects of hydromorphone on hippocampal electrographic activity of chemically-induced foci and continuous spike discharges were studied in cats. Foci were established with intrahippocampal (I.H.) picrotoxin; spike discharges of cholinergic origin were developed by I.H. injection of the anticholinesterase, diisopropylfluorophosphate (DFP). Although reducing the excitability of both types of repetitive discharges, i.v. hydromorphone (1-10 mg/kg) was more effective in suppressing picrotoxin foci than in abolishing the DFP discharges. Depression of the foci was antagonized by i.v. naloxone which unmasked a weaker excitatory hydromorphone action; this effect was similar to the increased excitation of foci produced by I.H. hydromorphone. The dominant depressant effects of hydromorphone on foci are attributed principally to an extrahippocampal site of action which augments local inhibition in the hippocampus. On DFP discharges I.H. hydromorphone had a biphasic action: small doses suppressed or abolished the DFP discharges; higher doses were focogenic. The depressed DFP activity was readily restored with supplemental I.H. ACh, suggesting that hydromorphone initially interfered with the local release of ACh. It is concluded that hydromorphone has a significant influence on the activity of the hippocampus to which both the direct and indirect actions of the opiate contribute.

BALL, J.C. and CHAMBERS, C.D., editors. The Epidemiology of Opiate Addiction in the United States. Springfield, Illinois: Charles C. Thomas, 1970.

A comprehensive epidemiological study of drug addiction in the U.S. is presented. Substantive findings concerning drug addiction are discussed based on a 6 year period of research at the addiction research center in Lexington, Kentucky. Research findings are presented pertaining to female, Negro, Chinese-American, Puerto Rican, and Mexican-American addicts, the phenomenon of onset of drug use, and concurrent barbiturate addiction. The spread of the intravenous method of hypodermic infection and the parentage and geographic mobility of U.S. addicts are examined. Questions of both etiology and prevention are considered along with an extensive overview of the hard narcotics problem in contemporary America.

BERLOW, L. and WORK, D.R. My student is on drugs -- What can I do? North Carolina Education (January, 1973)

BHARGAVA, H.N. and WAY, E.L. Brain acetylcholine (ACh) and choline (Ch) changes during acute and chronic morphinization and during abrupt and naloxone precipitated withdrawal in morphine tolerant dependent mice and rats. Proceedings of the Western Pharmacological Society 17: 173-177 (1974)

BLOOM, R., HAYS, J.R. and WINBURN, G.M. Marijuana use in urban secondary schools: A three-year comparison. International Journal of the Addictions 9(2): 329-335 (1974)

In this study the use of marijuana by high school students ranking from the lower to the upper socioeconomic class and including Blacks, Mexican-Americans, and Anglos was compared over a 3-year period. Analyses of the data revealed that the Preston and Hays findings of the incidence of reported marijuana use were comparable, and the different instruments and methodologies used by each investigator yielded data that were similar in pattern and frequency. The major finding was that marijuana use varies according to the ethnic and socioeconomic group examined.

BLUMBERG, H. and IKEDA, C. Interactions between naltrexone, morphine and cocaine in rats. Federation Proceedings (in press)

During the course of clinical narcotic blockade maintained by oral naltrexone HCl (N) administration, postaddicts frequently resort to the use of non-narcotic abuse drugs, such as cocaine HCl (C). Investigations in rats were undertaken to determine the possible effect of concomitant C administration upon the narcotic antagonist activity of N. Deep narcosis with loss of righting reflex (LRR) was produced in young fosted male rats by morphine sulfate (M) at 50 mg/kg s.c. Motor hyperactivity was produced in normal rats by C at 40 mg/kg i.p. When C was injected following M, deep narcosis with LRR still resulted, with occasional spasm, convulsion and sometimes death. Narcotic antagonism was determined by administering N p.o., followed in 20 min. by M s.c., and 10 min. later by saline or C i.p. ED50± s.e. values for N, as determined by protection against LRR, were: with saline .70± .08, with C 1.03 ± .12 mg/kg, indicating that C caused little or no interference with N narcotic antagonist action. At 10 mg/kg s.c. or 50 mg/kg p.o., N did not block C motor hyperactivity. When N at 1 mg/kg s.c. or 10 mg/kg p.o. preceded the M-C combination, narcosis and LRR were completely blocked and the motor hyperactivity of C emerged. Similarly, when N at 1 mg/kg s.c. was given to rats depressed by the M-C combination, the rats quickly righted and exhibited C motor hyperactivity.

BOND, D.D., BRACELAND, F.J., FREEDMAN, D.X., FRIEDHOFF, A.J., KOLB, L.C. and LOURIE, R.S., editors. The Year Book of Psychiatry and Applied Mental Health 1971. Chicago: Year Book Medical Publishers, Inc., 1971.

For abstract, see Section V. Adverse Effects, Toxicity and Genetic Effects.

BOYINK, N.O., HAYS, J.R. and WINBURN, G.M. Rural, urban, and white flight: The Texas drug studies. St. Joseph Hospital Medical Surgical Journal 9(1): 18-24 (March, 1974)

Between December 1971 and April 1972, the prevalence of drug use among secondary school students in each of three geographical locations in Texas was surveyed. Each of these three studies was conducted at the request of someone in that location with an interest in the actual level of drug use. In Houston, the Houston Independent School District Committee on Drug Abuse had sponsored a similar survey in 1970 and was interested in changes and trends in drug use. In Alief the school district supervisors were interested in the prevalence of drug use in Alief schools. The Plainview study was instigated by the Central Plains Community Mental Health Center. When all three surveys were completed, it seemed worthwhile to compare them, since each area represented a different cultural environment for the students growing up there. This comparison centers mainly on the amount of drug use for each community: rural, urban, and white-flight suburban. Brief mention is made of patterns of use associated with demographic variables for each community.

In examining these communities, we found many factors that varied among the children in each of the three areas. The biggest difference is probably between the variety of life styles and possible value systems to which the children are exposed. The pace of life, the exposure to the rest of the world is very different in an industrial city of two million people than it is in a white suburb 20 miles away or in a small rural town 500 miles away. Since drug abuse is often considered a societal problem, it is interesting to compare the prevalence of drug use in these three different environments.

BRACELAND, F.J., FREEDMAN, D.X., FRIEDHOFF, A.J., KOLB, L.C., LOURIE, R.S. and ROMANO, J., editors. The Year Book of Psychiatry and Applied Mental Health 1973. Chicago: Year Book Medical Publishers, Inc., 1973.

For abstract, see Section V. Adverse Effects, Toxicity and Genetic Effects.

BRACELAND, F.J., FREEDMAN, D.X., FRIEDHOFF, A.J., LOURIE, R.S. and ROMANO, J., editors. The Year Book of Psychiatry and Applied Mental Health 1972. Chicago: Year Book Medical Publishers, Inc., 1972.

For abstract, see Section V. Adverse Effects, Toxicity and Genetic Effects.

BRAESTRUP, C. Effects of phenoxybenzamine, aceperone and clonidine on the level of 3-methoxy-4-hydroxyphenylglycol (MOPEG) in rat brain. Journal of Pharmacy and Pharmacology 26(2): 139-141 (February, 1974)

BRASE, D.A., TSENG, L., LOH, H.H. and WAY, E.L. Cholinergic modification of naloxone-induced jumping in morphine dependent mice. European Journal of Pharmacology 26: 1-8 (1974)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

BRILL, N.Q. The marijuana problem. California Medicine 114(4): 55-57 (April, 1971)

BRILL, N.Q. The marijuana problem in perspective. Military Medicine 138(4): 205-210 (April, 1973)

BRILL, N.Q., CRUMPTON, E., FRANK, I.M., HOCHMAN, J.S., LOMAX, P., McGLOTHLIN, W.H. and WEST, L.J. The marijuana problem. Annals of Internal Medicine 73: 449-465 (1970)

For abstract, see Section V. Adverse Effects, Toxicity and Genetic Effects.

BROTMAN, R., SILVERMAN, I. and SUFFET, F. Drug use among affluent high school youth. Marijuana. Edited by E. Goode. New York: Atherton Press, 1969.

BROTMAN, R. and SUFFET, F. The concept of prevention and its limitations. Annals of American Academy of Political and Social Science (in press)

BROTMAN, R. and SUFFET, F. Illicit drug use: Preventive education in the schools. Psychiatric Annals (April, 1973)

BROWNE-MAYERS, A.N., SEELYE, E.E., SEIXAS, F. and STOKES, P. Alcoholism and drug abuse. Chapter 25 of Progress in Neurology and Psychiatry, Vol. 28. Edited by E.A. Spiegel. New York: Grune and Stratton, Inc., 1973. Pp. 449-467.

CHAMBERS, C.D. and INCIARDI, J.A. Forecasts for the future: Where we are and where we are going. Drugs and the Criminal Justice System. Edited by J.A. Inciardi and C.D. Chambers. Beverly Hills, California: Sage Publications, 1974.

Significant issues which require careful planning and refocusing of drug prevention and intervention efforts are analyzed. A significant focus for reducing crime is to increase the number of addicts in treatment. Most control efforts addressing this social problem function as if drug use and drug-related crime were operating independently of the other major social problems in urban settings. The long-term reduction of addict crime will come about only after society addresses the correlate social problems. Most of society in general and law enforcement people in specific react to all drug use as if it were the most dangerous dysfunctional abuse. Some drug experimentation and some social/recreational use of drugs will become normal behavior. Prevention and intervention efforts will become focused upon the persons so involved with drugs that this use becomes a significant role in their lives and they cease adequate functioning in their other roles. The pursuit of apprehension and punishment of those involved in victimless crime must change if our criminal justice system is to remain credible.

CHENEY, D.L., JUDSON, B.A. and GOLDSTEIN, A. Failure of an opiate to protect mice against naloxone-precipitated withdrawal. The Journal of Pharmacology and Experimental Therapeutics 182(2): 189-194 (1972)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

COCHIN, J. Methods for the appraisal of analgesic drugs for addiction liability. Selected Pharmacological Testing Methods, Vol. 3. Edited by A. Burger. Medicinal Research Series. New York: Marcel Dekker, Inc., 1968.

For abstract, see Section I. Methodology of Drug Research.

COCHIN, J. The role of the professional in affecting the climate surrounding the issue of drug abuse. Chapter 33 of Drugs and Youth. Proceedings of the Rutgers Symposium on Drug Abuse. Edited by J.R. Wittenborn, H. Brill, J.P. Smith and S.H. Wittenborn. Springfield, Illinois: Charles C. Thomas, 1969.

COCHIN, J. and HARRIS, L. Study of synthetic substitutes for morphine. Committee on Problems of Drug Dependence. Washington, D.C.: National Academy of Sciences, National Research Council, 1974.

COCHIN, J., SPIVAK, C.T. and LIPPER, S. Characteristics of the inhibition of n-demethylation of narcotic drug substrates by various antagonists. The Pharmacologist 9: 218 (1967)

For abstract, see Section II. Drug Chemistry and Metabolism.

COHN, M.L. and COHN, M. Norepinephrine -- an antagonist of dibutyryl cyclic AMP in the regulation of narcosis in the rat. Federation Proceedings 33: 494 (1974)

For abstract, see Section IV. Behavioral Studies.

COHN, M.L., COHN, M. and TAYLOR, F.H. Norepinephrine - an antagonist of dibutyryl cyclic AMP in the regulation of narcosis in the rat. Research Communications in Chemical Pathology and Pharmacology 7: 687-699 (1974)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

COHN, M.L., TAYLOR, F., COHN, M. and YAMAOKA, H. Dibutyryl cyclic AMP - an effective antidote against lethal amounts of amobarbital in the rat. Research Communications in Chemical Pathology and Pharmacology 6: 435-446 (1973)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

COHN, M.L., YAMAOKA, H., TAYLOR, F.H. and KARYNACK, B. Action of intracerebroventricular dibutyryl cyclic AMP on amobarbital anesthesia in rats. Neuropharmacology 12: 401-405 (1973)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

COLASANTI, B. and KHAZAN, N. Agonistic properties of narcotic analgesics and antagonists on the electroencephalogram and behavior in the rat and their reversal by naloxone. Neuropharmacology 12: 619-627 (1973)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

COLASANTI, B. and KHAZAN, N. Antagonism of the acute electroencephalographic and behavioral effects of morphine in the rat by depletion of brain biogenic amines. Neuropharmacology 12: 463-469 (1973)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

COLASANTI, B. and KHAZAN, N. Interactions of narcotic analgesics and antagonists on the electroencephalogram (EEG) and behavior of the rat. Federation Proceedings 31: 304 (1972)

COLLINS, P., WEI, E. and WAY, E.L. The central site of morphine analgesia in rats. Proceedings of the Western Pharmacological Society 17: 164-167 (1974)

COUSSENS, W.R., CROWDER, W.F. and DAVIS, W.M. Morphine induced saccharine aversion in alpha-methyltyrosine pretreated rats. Psychopharmacologia 29: 151-157 (1973)

For abstract, see Section I. Methodology of Drug Research.

DAHLBERG, C.C. Let's stop lying about drugs. Medical Economics (special issue) (April, 1970)

DAVIS, F. and MUNOZ, L. Heads and freaks: Patterns and meanings of drug use among hippies. Journal of Health and Social Behavior (June, 1968)

An emerging social typology among Haight-Ashbury hippies is the as yet largely implicit distinction drawn by them between "heads" and "freaks". At the simple denotative level the former refers to regular users of LSD, the latter to those who regularly "shoot speed" (inject Methedrine). These terms have, however, acquired great referential elasticity and connote different hippie life-styles along with their associated philosophical and attudinal outlooks. From the vantage-point of this broadened socio-linguistic context, the terms reflect both differential sources of social recruitment to the "head" and "freak" drug use patterns as well as a prominent value tension within the hippie subculture between contemplative, inwardly-directed forms of "mind-expansion" and more hedonistically oriented forms of sensual excess.

DAVIS, W.M., BABBINI, M., COUSSENS, W.R., SMITH, S.G. and CROWDER, W.F. Antagonism of behavioral effects of morphine by alpha-methyltyrosine (AMT). The Pharmacologist 13(2): 280 (1971)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

DAVIS, W.M., BABBINI, M. and KHALSA, J.H. Antagonism by alpha-methyltyrosine of morphine induced motility in non-tolerant and tolerant rats. Research Communications in Chemical Pathology and Pharmacology 4(2): 267-279 (1972)

For abstract, see Section III. Mechanisms of Action of Different Drugs

DAVIS, W.M., LOGSTON, D.G. and HICKENBOTTOM, J.P. Antagonism of acute amphetamine intoxication by haloperidol and propranolol. Toxicology and Applied Pharmacology 29: 397-403 (1974)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

DAVIS, W.M. and SMITH, S.G. Alpha-methyltyrosine to prevent self-administration of morphine and amphetamine. Current Therapeutic Research 14(12): 814-819 (1972)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

DAVIS, W.M. and SMITH, S.G. Blocking effect of alpha-methyltyrosine on amphetamine based reinforcement. Journal of Pharmacy and Pharmacology 25: 174 (1973)

DAVIS, W.M. and SMITH, S.G. Blocking of morphine based reinforcement by alpha-methyltyrosine. Life Sciences 12: 185-191 (1973)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

DAVIS, W.M. and SMITH, S.G. Naloxone use to eliminate opiate-seeking behavior: Need for extinction of conditioned reinforcement. Biological Psychiatry 9(2): 181-189 (1974)

For abstract, see Section IV. Behavioral Studies.

DAVIS, W.M. and SMITH, S.G. Noradrenergic basis for reinforcement associated with morphine action in nondependent rats. Clinical Toxicology 7: 265 (1974)

DEWEY, W.L. Narcotic-antagonist assay procedures in dogs. Narcotic Antagonists. Edited by M.C. Braude, L.S. Harris, E.L. May, J.P. Smith and J.E. Villarreal. Advances in Biochemical Pharmacology, Vol. 8. New York: Raven Press. 1973. Pp. 263-272.

For abstract, see Section I. Methodology of Drug Research.

DEWEY, W.L. and HARRIS, L.S. Antagonistic activity of morphine and other narcotics in the mouse locomotor activity test. The Pharmacologist 15(2): 65 (1973)

For abstract, see Section IV. Behavioral Studies.

DEWEY, W.L. and HARRIS, L.S. Intraperitoneal infusion of narcotic antagonists in rats. Sixth International Congress of Pharmacology, Helsinki, Finland (in press)

For abstract, see Section V. Adverse Effects, Toxicity and Genetic Effects.

DEWEY, W.L., HARRIS, L.S., HOWES, J.F. and NUITE, J. The effect of various neurohormonal modulators on the activity of morphine and the narcotic antagonists in the tail-flick and phenyquinone tests. The Journal of Pharmacology and Experimental Therapeutics 175(2): 435 (1970)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

DEWEY, W.L., HARRIS, L.S. and PATRICK, G.A. Annual report on narcotic antagonists. Committee on Problems of Drug Dependence. Washington, D.C.: National Academy of Sciences, National Research Council (in press)

DOWNS, D.A. Narcotic antagonists: Behavioral paradigms of aversive control. Presented at the Eastern Psychological Association Meeting, Washington, D.C., May 3, 1973.

DOWNS, D.A. and WOODS, J.H. Effects of morphine, pentazocine, and naloxone on operant responding in monkeys and pigeons. The Pharmacologist 16: 263 (1974)

For abstract, see Section IV. Behavioral Studies.

DOWNS, D.A. and WOODS, J.H. Naloxone: Behavioral paradigms of aversive control. The Pharmacologist 15: 237 (1973)

For abstract, see Section IV. Behavioral Studies.

DOWNS, D.A. and WOODS, J.H. Naloxone-maintained schedules of negative reinforcement in morphine-dependent rhesus monkeys. Committee on Problems of Drug Dependence. Washington, D.C.: National Academy of Sciences, National Research Council, 1974. Pp. 826-838.

DRAWBAUGH, R. and LAL, H. Reversal by narcotic antagonist of a narcotic action elicited by a conditional stimulus. Nature 247: 65-67 (January, 1974)

DWARSHUIS, L. Police-community relationships in innovative drug programs. Journal of Forensic Psychology (Winter, 1973)

DWARSHUIS, L., KOLTON, M. and GORODEZKY, M. Role of volunteers in innovative drug treatment programs. Proceedings, 81st Annual Convention, American Psychological Association. Washington, D.C.: American Psychological Association, 1973. Pp. 967-968.

In this paper, findings regarding the use of volunteers in drug treatment programs are presented. Special emphasis is placed on learning what types of persons volunteer their services and what issues face programs with a mostly volunteer staff.

DWARSHUIS, L., KOLTON, M.S. and GORODEZKY, M. The treatment approach of innovative drug programs for youth. Drug Forum 3(3): 249 (Spring, 1974)

The treatment approaches of 72 innovative drug programs were studied. A wide variety of services were offered on a routine basis, including individual and group counseling, crisis intervention, consciousness raising techniques and alternative activities. The voluntary nature of treatment made client selection and follow-up difficult. Dependency on the program often became an issue. Increasingly treatment has shifted toward a community prevention emphasis.

DYKSTRA, L.A., McMILLAN, D.E. and HARRIS, L.S. Antagonism of morphine by long-acting narcotic antagonists. Psychopharmacologia 39: 151-162 (1974)

For abstract, see Section IV. Behavioral Studies.

EIDELBERG, E. and BOND, M.L. Effects of morphine and antagonists on hypothalamic cell activity. Archives internationales de Pharmacodynamie et de Therapie 196: 16-24 (1972)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

EIDELBERG, E. and ERSPAMER, R. Failure of naloxone to prevent acute morphine tolerance and dependence. Archives internationales de Pharmacodynamie et de Therapie 211(1): 58-63 (1974)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

EIDELBERG, E. and LOSCHIAVO, C.M. Effects of morphine and opioid antagonists on the central nervous system. Committee on the Problems of Drug Dependence. Washington, D.C.: National Academy of Sciences, National Research Council, 1969.

ELLINWOOD, E.H., JR. and COHEN, S. Meetings: Amphetamine abuse. Science 171: 420-421 (January, 1971)

EL-YOUSEF, M.K., JANOWSKY, D.S., DAVIS, J.M. and ROSENBLATT, J.E. Induction of severe depression by physostigmine in marijuana intoxicated individuals. British Journal of the Addictions (in press)

FIDELL, L.S. Put her down on drugs: Prescribed drug usage in women. Presented at the Western Psychological Association Meeting. Anaheim, California, April 12, 1973.

FINK, M. Narcotic antagonists in opiate dependence. Science 169: 1005-1006 (1970)

FINK, M. A rational therapy of opiate dependence: Narcotic antagonists. Drug Abuse: Proceedings of the International Conference. Edited by C.J.D. Zarafonetis. Philadelphia, Pennsylvania: Lea and Febiger, 1971.

FINK, M. Treatment and prevention of opiate dependence. Contemporary Drug Problems. Washington, D.C.: Federal Legal Publications, 1972.

FINK, M. and FREEDMAN, A.M. Antagonists in the treatment of opiate dependence. Modern Trends in Drug Dependence and Alcoholism. Edited by R.V. Phillipson. London: Butterworths, 1970. Pp. 49-59.

Following the theoretic view that relapse in opiate dependence may be related to conditioning, often to subtle environmental clues, a treatment model was suggested using narcotic antagonists and repeated exposure to narcotics to produce deconditioning. Nalorphine was suggested in this context but its duration was too short.

Studies with two active antagonists, Cyclazocine and Naloxone, are reported. These have proved sufficiently useful to recommend continued clinical trials. Engagement to a rehabilitation programme and anti-depressant activity are observed as useful concomitants of the narcotic antagonist approach.

FINK, M., FREEDMAN, A., ZAKS, A., SHAROFF, R. and RESNICK, R. Narcotic antagonists and substitutes in opiate dependence. The Present Status of Psychotropic Drugs. Edited by A. Cerletti and F.J. Bove. Amsterdam, the Netherlands: Excerpta Medica Foundation, 1969.

FINK, M., ITIL, T., ZAKS, A. and FREEDMAN, A. EEG patterns of cyclazocine, a narcotic antagonist. Neurophysiological and Behavioral Aspects of Psychotropic Drugs. Edited by A. Karczman and W.P. Koella. Philadelphia, Pennsylvania: Charles C. Thomas, 1971.

For abstract, see Section III. Mechanisms of Action of Different Drugs.

FINK, M., SIMEON, J., ITIL, T. and FREEDMAN, A. Clinical antidepressant activity of cyclazocine - a narcotic antagonist. Clinical Pharmacology and Therapeutics 11(1): 41-48 (1970)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

FINK, M., ZAKS, A., RESNICK, R.B. and FREEDMAN, A.M. Narcotic antagonists in the treatment of opiate dependence. International Journal of Clinical Pharmacology, Therapy and Toxicology 4: 455-458 (1971)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

FINK, M., ZAKS, A., RESNICK, R. and FREEDMAN, A. Opiate antagonists in the treatment of heroin dependence in man. Narcotic Drugs: Biochemical Pharmacology. Edited by D. Clouet. New York: Plenum Press, 1971.

For abstract, see Section III. Mechanisms of Action of Different Drugs.

FINK, M., ZAKS, A., SHAROFF, R., MORA, A., BRUNER, A., LEVIT, S. and FREEDMAN, A.M. Naloxone in heroin dependence. Clinical Pharmacology and Therapeutics 9: 568-577 (1968)

Naloxone is a potent and rapidly acting narcotic antagonist, with a duration of action which is shorter (3 to 4 hours) than that of heroin. In a clinical trial of naloxone in the treatment of heroin dependence, a daily oral dose of 100 mg. at 8 a.m. and 7 p.m. effectively blockaded 20 mg. of heroin, with partial blockade of 40 mg., for up to 10 hours after the morning dose. In narcotic antagonism therapy of opiate dependence, naloxone has the advantages of potency, rapid action, absence of secondary effects, and acceptability. It has the disadvantages of brief action and high cost.

FINK, M., ZAKS, A., VOLAVKA, J. and ROUBICEK, J. Electrophysiological studies of opiates and antagonists in man. Narcotic Drugs: Biochemical Pharmacology. Edited by D. Clouet. New York: Plenum Press, 1971.

FISHMAN, J., COTTER, M.L. and NORTON, B.I. Narcotic antagonists. 2. Preparation and biological stability of naxolone-7,8-^{3}H. Journal of Medicinal Chemistry 16: 556-557 (1973)

FISHMAN, J., NORTON, B. and HAHN, E. Differential distribution of opiate agonists and antagonists in the rat brain as determined by double isotope techniques. Presented at meeting of the American Society of Biological Chemists, 1974.

For abstract, see Section I. Methodology of Drug Research.

FISHMAN, J., ROFFWARG, H. and HELLMAN, L. Disposition of naloxone-7,8-^{3}H in normal and narcotic-dependent men. The Journal of Pharmacology and Experimental Therapeutics 187(3): 575-580 (1973)

For abstract, see Section I. Methodology of Drug Research.

FORBES, J.E., DEWEY, W.L. and HARRIS, L.S. The effect of narcotics and narcotic antagonists on ganglionic transmission in rat. Federation Proceedings (in press)

For abstract, see Section II. Drug Chemistry and Metabolism.

FREEDMAN, A.M., ZAKS, A., RESNICK, R. and FINK, M. Blockade with methadone, cyclazocine, and naloxone. International Journal of the Addictions 5(3): 507-515 (September, 1970)

GELLER, I., HARTMANN, R.J. and BLUM, K. The effects of low-dose combinations of d-amphetamine and cocaine on experimentally induced conflict in the rat. Current Therapeutic Research 14(4): 220-224. (April, 1972)

For abstract, see Section IV. Behavioral Studies.

GELLERT, V.F. and SPARBER, S.B. Utilization of operant technics to assess degree of opiate dependence after pellet implantation and naloxone administration: A comparison with body weight changes. Federation Proceedings 33(3): 501 (1974)

For abstract, see Section IV. Behavioral Studies.

GESSNER, P.K. Antagonism of the tranylcypromine-meperidine interaction by chlorpromazine in mice. European Journal of Pharmacology 22: 187-190 (1973)

For abstract, see Section V. Adverse Effects, Toxicity and Genetic Effects.

GESSNER, P.K. and SOBLE, A.G. Antagonism of p-chlorophenylalanine of late tranylcypromine toxicity. Journal of Pharmacy and Pharmacology 24: 825-827 (1972)

GESSNER, P.K. and SOBLE, A.G. Studies on the role of brain 5-hydroxytryptamine in the interaction between tranylcypromine and meperidine. Federation Proceedings 29: 685 (1970)

Rogers and Thornton (Br. J. Pharm. 36, 470, 1969) have suggested that the increased toxicity of meperidine (MEP) after tranylcypromine (TCP) is due to the accumulation of brain 5-hydroxytryptamine (5-HT) consequent to monoamineoxidase inhibition. To test this hypothesis we determined the toxicity of the TCP-MEP combination at 5 different doses in mice pretreated for 3 days with 100 mg/kg/day p-chlorophenylalanine (PCPA), an inhibitor of 5-HT synthesis. TCP sulfate and MEP hydrochloride were always injected i.p. in a dose ratio of 3:10 by weight 4 hrs. apart. (Isobolographic analysis showed the effects of TCP and MEP at a dose ratio of 3:10 to be more than additive.) Mice pretreated with PCPA exhibited significantly lower 4 and 24 hr. mortalities than did saline pretreated controls (P less than 0.001 and P less than 0.001 respectively). 5-Hydroxytryptophane (5-HTP), on the other hand, when administered i.p. 1 hr. prior to MEP (where TCP:5-HPT:MEP = 3:1:10 at 6 different doses) resulted in a significantly higher 1 hr. mortality than was observed in controls receiving TCP, saline and MEP (P=.04). We also have found that pretreatment with chlorpromazine in a dose of 10 or 20 mg/kg 1 hr. before MEP significantly (P less than 0.001) decreases the toxicity of the TCP-MEP combination.

GOLDBERG, S.R. Nalorphine: Conditioning of drug effects on operant performance. Stimulus Functions of Drugs. Edited by G. Heistad, T. Thompson and R. Pickens. New York: Appleton-Century-Crofts, 1970.

GOLDBERG, S.R., HOFFMEISTER, F. and SCHLICHTING, U.U. Morphine antagonists: Modification of behavioral effects by morphine dependence. Drug Addiction: Experimental Pharmacology, Vol. 1. Edited by J.M. Singh, L. Miller and H. Lal. Mount Kisco, New York: Futura Publishing Company, Inc., 1972. Pp. 31-48.

GOLDBERG, S.R. and SCHUSTER, C.R. Conditioned suppression by a stimulus associated with nalorphine in morphine-dependent rhesus monkeys. Journal of the Experimental Analysis of Behavior 10: 235 (1967)

For abstract, see Section IV. Behavioral Studies.

GOLDBERG, S.R. and SCHUSTER, C.R. Nalorphine: Increased sensitivity of monkeys formerly dependent on morphine. Science 166: 1548-1549 (1969)

Three rhesus monkeys Macaca mulatta, formerly dependent on morphine, had increased sensitivity to nalorphine's effect of suppressing operant responding for food, as compared with two monkeys with no history of morphine exposure. Within the dose range employed, nalorphine injections produced emesis, salivation, and hyperirritability in formerly morphine-dependent monkeys but not in controls.

GOLDBERG, S.R. and SCHUSTER, C.R. Persistence, extinction, and reconditioning of conditioned morphine-withdrawal changes in post-addict monkeys. Federation Proceedings 28: 512 (1969)

Three morphine-dependent rhesus monkeys were reinforced with food presentations following every tenth response. A red light, which initially had no effect on food responding or heart rate, was aperiodically presented every third or fourth session, 5-min before and after an intravenous injection of nalorphine, a morphine antagonist which produces an immediate withdrawal syndrome in morphine-dependent monkeys. After several such pairings, conditioned suppression of food responding and heart rate occurred during the 5-min red light period prior to the nalorphine injection, confirming results of our previous study (Fed. Proc. 25: 261, 1966). After ten pairings of the red light and nalorphine, two of the monkeys were completely withdrawn from morphine and were tested monthly for the persistence of the conditioned response. Conditioned suppression to the red light and saline injections was observed for 1-4 months following the withdrawal of morphine. Repeated presentations of the red light-saline injection complex led eventually to the extinction of conditioned suppression. Nevertheless, conditioned suppression could be rapidly reinstated by additional nalorphine injections.

GOLDBERG, S.R., WOODS, J.H. and SCHUSTER, C.R. Nalorphine-induced changes in morphine self-administration in rhesus monkeys. The Journal of Pharmacology and Experimental Therapeutics 176: 464-481 (1971)

For abstract, see Section IV. Behavioral Studies.

GOLDSTEIN, A. Comments on the drug abuse problem. The Challenge of Life: Biomedical Progress and Human Values. Edited by R.M. Kunz and H. Fehr. Basel, Switzerland: Birkhauser Verlag, 1972. P. 96.

GOLDSTEIN, A. Interactions of narcotic antagonists with receptor sites. Narcotic Antagonists. Edited by M.C. Braude, L.S. Harris, E.L. May, J.P. Smith and J.E. Villarreal. Advances in Biochemical Psychopharmacology, Vol. 8. New York: Raven Press, 1973.

Evidence is summarized, from the work of others, indicating that narcotic antagonists occupy receptor sites passively and reversibly, whereas agonists occupy the same sites actively, promoting conformation change in the receptor. A derivative conclusion is that narcotic receptor sites do not ordinarily interact with any essential endogenous substrate such as a neurotransmitter. The receptor, however, could have two sites - one for an endogenous substrate, the other an allosteric site interacting with narcotic agonists and antagonists. A method is described whereby the interaction of naloxone with brain proteolipid can be followed and compared with the similar interactions of levorphanol. The system may be conducive to obtaining direct evidence about induced conformational change. The guinea pig ileum longitudinal muscle-myenteric plexus preparation from tolerant-dependent guinea pigs is tolerant to morphine and also to catecholamines, is supersensitive to serotonin, and has unchanged sensitivity to acetylcholine. An interpretation of these findings is offered, explaining the basis of tolerance and dependence. Some receptors in the central nervous system, which are responsible for precipitated withdrawal caused by naloxone, have different kinetic properties from those that mediate various acute effects of the narcotics. The interaction between naloxone and these receptors is noncompetitive with respect to narcotic agonists. A well-known discrepancy between the duration of action of methadone as an agonist and as a suppressor of withdrawal points in the same direction.

GOLDSTEIN, A., LOWERY, P.J. and LOWNEY, L.I. Increased binding of an opiate narcotic to a receptor proteolipid in the presence of naloxone. Federation Proceedings 33(3): 474 (March, 1974)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

GOLDSTEIN, J.W. Students' evaluations of their psychoactive drug use. Journal of Counseling Psychology (in press)

For abstract, see Section V. Adverse Effects, Toxicity and Genetic Effects.

GORODEZKY, M.J., DWARSHUIS, L. and KOLTON, M.S. Evaluation research with innovative drug programs. Drug Forum 3(4): 349 (Summer, 1974)

Innovative drug programs often do not engage in any systematic program evaluation. This absence of evaluation does not reflect an arbitrary resistance; rather, it may be produced by difficulties in establishing evaluation criteria, devising a measurement process, and/or potential cultural biases by available researchers. This paper gives a definition for good evaluation. Elements of the definition are: a non-judgemental style by the evaluator, the use of unobtrusive measures, and the importance of feedback to program staff.

GRAY, A.P. Long acting narcotic antagonist complexes. Proceedings of the Workshop on Narcotic Abuse Problems (in press)

With the ultimate objective of developing long-acting narcotic antagonist preparations for intramuscular administration in the treatment of narcotic dependence, we have prepared a large number of essentially water-insoluble salts and complexes of cyclazocine, naloxone and naltrexone. Salts were derived from a variety of mono- and poly-basic organic acids, and complexes from polybasic organic acids and the polyvalent metal ions, Zn^{++}, Al^{+++}, Mg^{++} and Ca^{++}. As a guide to the selection of preparations for study in animals, the equilibrium percent dissociation of these salts and complexes was determined in vitro in a simulated physiological medium. Duration of narcotic antagonist activity of selected salts and complexes administered by intramuscular injection to mice was determined at several dose levels by a modification of the tail-flick test for analgesia.

The most significant increases in duration of narcotic antagonist activity in vivo were shown by zinc tannate and aluminum tannate complexes, particularly when these were administered in suspension in an aluminum monostearate gel in peanut oil. Two of these, naltrexone zinc tannate and naltrexone aluminum tannate appear most promising and are being subjected to detailed evalution in anticipation of possible clinical trial. The duration of activity in mice of naltrexone zinc tannate has been independently confirmed and preliminary toxicological study has revealed no untoward effects. The work is continuing.

GRAY, A. P. and ROBINSON, D. S. Insoluble salts and salt complexes of cyclazocine and naloxone. Narcotic Antagonists. Edited by M. C. Braude, L. S. Harris, E. L. May, J. P. Smith and J. E. Villarreal. Advances in Biochemical Psychopharmacology, Vol. 8. New York: Raven Press, 1973.

The ultimate objective of this research is the development of long-acting narcotic antagonist preparations for intramuscular administration in the treatment of narcotic dependence. To this end, we have thus far prepared 23 salts of cyclazocine and 11 salts of nalozone with various mono- and polybasic organic acids. In general, salts of methadone were more soluble than those of cyclazocine which were more soluble than those of nalozone. From study of a large number of organic acids, a rather complete picture has been deduced of the structural features which need to be present in the acid if it is to yield a water-insoluble salt with an antagonist base. Various methods were explored to incorporate metal ions into complexes with drug and organic acid. Generally, complexes were less soluble than corresponding simple salts. Twelve complexes of cyclazocine and seven of naloxone have been prepared to date. As a guide to the selection of preparations for study in animals, the percent dissociation of our salts and complexes was determined in vitro in a simulated physiological medium. Duration of narcotic antagonist activity of selected salts and complexes administered intramuscularly to mice was determined by a modification of the tail-flick test for analgesia, essentially according to Harris et al. (5). Eighteen preparations of cyclazocine and six of naloxone have thus far been evaluated for duration of antagonist activity. A suggestion of a correlation has been observed between duration of activity in vivo and percent dissociation in vitro. Several of our preparations have significantly increased duration of narcotic antagonist activity in mice. These are being studied further.

GRAY, A. P. and ROBINSON, D. S. Naltrexone zinc tannate: A prolonged-action narcotic antagonist complex. Journal of Pharmaceutical Sciences 63(1): 159-161 (January, 1974)

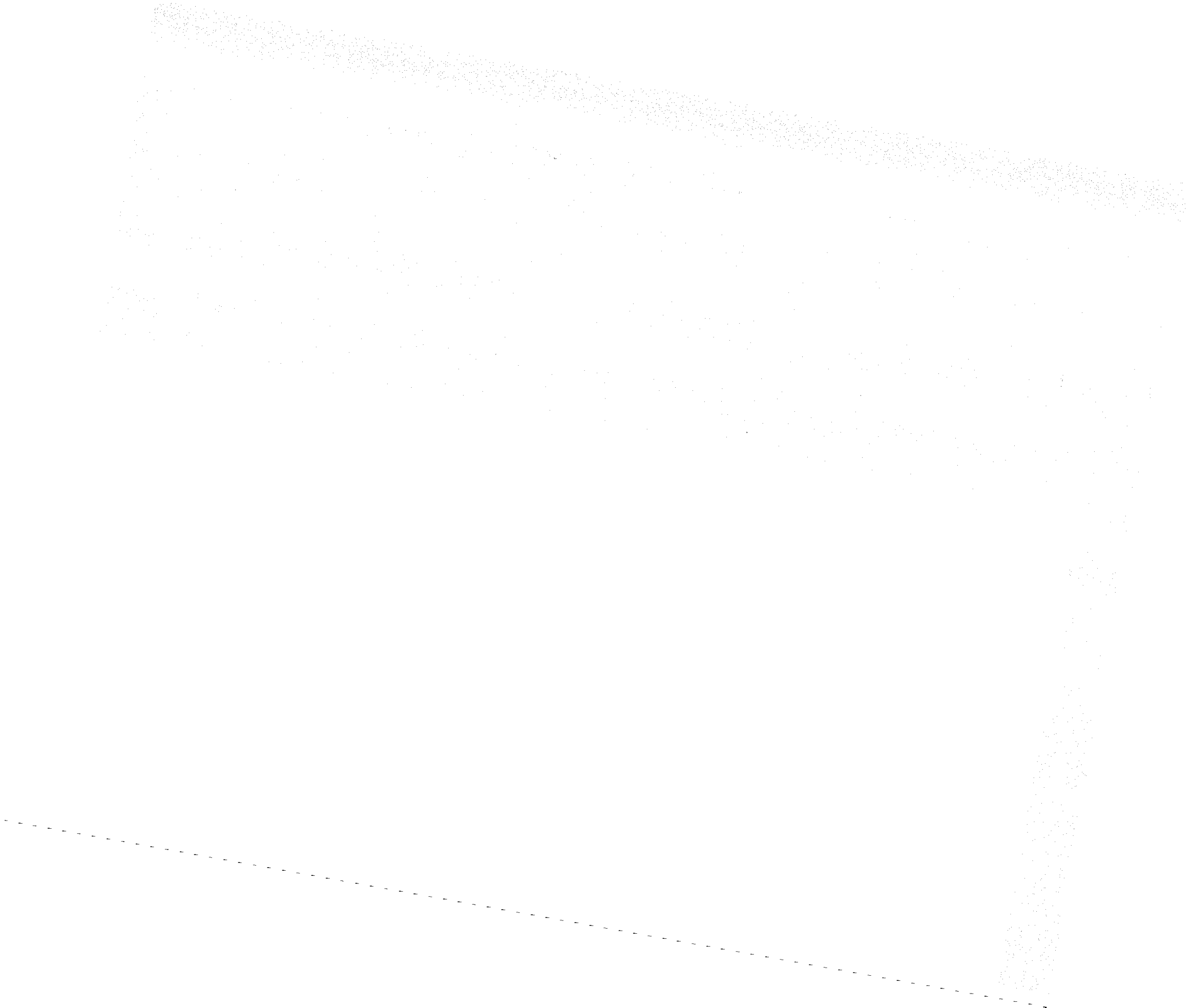
GRIFFITHS, R. R., WURSTER, R., FINDLEY, J. and BRADY, J. V. Reduction of heroin self-administration in baboon subjects by manipulation of behavioral and pharmacological conditions. Presented at the Annual Meeting of the American Psychological Association, Baltimore, Maryland, 1974.

HAHN, E. F. and FISHMAN, J. Narcotic antagonists v. stereochemistry of reactions at C-6 in 14-hydroxynoroxymorphone derivatives. Journal of Organic Chemistry (in press)

The epimeric products of the borohydride reduction and of the methyl lithoum reaction of the C-6 ketone of naloxone were isolated. The stereochemistry of the products was assigned on the basis of nmr evidence, which indicates that in each case the major product has the 6 alpha-hydroxy orientation.

HAHN, E. F., FISHMAN, J. and HEILMAN, R. D. Narcotic antagonists IV. C-6 derivatives of N-substituted noroxymorphones as narcotic antagonists. Journal of Medicinal Chemistry (in press)

A series of new narcotic antagonists have been synthesized by modifying the C-6 carbonyl group in naloxone Ia and naltrexone Ib. New functional units were introduced by reaction with various phosphorus and sulfur ylids and alkyl lithium reagents. The activity of the new compounds was measured by the hot plate and tail clip tests after oral administration to mice. The majority of the new narcotic antagonists exhibited oral potencies considerably superior to the parent compounds, with 6-methylene derivatives IIa and IIb showing the most impressive increases.



HANLON. T.E., KURLAND, A.A. and McCABE, O.L. Naloxone treatment of the paroled narcotic addict: A program of research. Neurotherapy and Other Treatments, Vol. 5. Edited by J. Singh. Mount Kisco, New York: Futura Publishing Company, 1974.

The overall findings of a long term research program on the use of naloxone with the paroled narcotic addict were reported. The first two studies of the four study program involved successive pilot and controlled evaluations of the effectiveness of daily administered, low dose naloxone (200 to 800 mg.), termed a "partial," or brief, blockade approach. The two subsequent studies involved successive pilot and controlled evaluations of the effectiveness of a higher dose of naloxone (500 to 2000 mg.), administered on a "contingent" basis; i.e., whenever there was evidence of narcotic drug use. Outcome results (retention in the treatment program vs. absconding and reinstitutionalization) for both the partial and contingent approaches were consistent. Although initial pilot findings in both instances had been encouraging, no significant differential results between naloxone and placebo were subsequently found in controlled research. Interestingly, results of narcotic drug usage in the two controlled studies were not consistent, having been in favor of naloxone over placebo in the partial blockade method and having revealed no difference between active and inactive drugs in the contingent approach. This inconsistency was explainable in terms of increased placebo effectiveness under contingent conditions, a phenomenon that possibly bears further investigation. The chief weakness of the narcotic antagonist approach was discussed (i.e., the lack of adherence to a prescribed treatment regimen because of the addict's capability of titrating his own medication intake), and the importance of a high level of motivation on the part of the patient was again observed. The use of naloxone with an essentially unmotivated population was considered particularly limited in view of its brief duration of action and the relatively high oral dose necessary to achieve a 24-hour blockade. Implications and advantages of a sustained released form of a narcotic antagonist agent were briefly noted.

HANLON. T.E., McCABE, O.L. and KURLAND, A.A. Contingent naloxone treatment of the narcotic addict. American Journal of Drug Abuse and Alcoholism (in press)

HARRIGAN, S.E. and McCARTHY, D.A. Morphine, propranolol and their interaction in monkeys trained to self-administer drugs. The Pharmacologist 15(2): 237 (Fall, 1973)

Clinical reports have claimed that propranolol is effective in the treatment of heroin dependence (Grosz, Lancet Sept. 1972 & J. Ind. State Med. Assoc. 65, 1972). Because of the similar pharmacologic responses between man and M. Mulatta with respect to opiate drug seeking behavior and dependence, monkeys trained to self-administer drugs were used to test this propranolol-morphine interaction under controlled experimental conditions. Minimally restrained self-administering monkeys were trained to discriminate between morphine (8 mu-g/kg/injection) and saline on a limited access schedule of 15 minutes every 4 hours for 2 days on morphine alternating with 2 days on saline. Propranolol (1 mg/kg IM) given 30 minutes prior to the first 3 sessions on morphine following the saline (control) days did not antagonize the self-administration of morphine, whereas naloxone was highly effective in this procedure. Additionally, propranolol itself was found to be weakly reinforcing in methamphetamine trained self-administering monkeys. These results offer no support of a presumptive nature for the claim that propranolol interferes with opiate drug seeking behavior.

HASSELAGER, E., ROLINSKI, Z. and RANDRUP, A. Specific antagonism by dopamine inhibitors of items of amphetamine induced aggressive behaviour. Psychopharmacologia 24: 485-495 (1972)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

HAYS, J.R. The incidence of drug abuse in the secondary schools of the Houston Independent School District. A Technical Report to the Drug Education Committee of the Board of Education of the Houston Independent School District, November, 1971.

The student drug survey was designed to provide relevant information on four points. It would provide the baseline data necessary to detect changes in the pattern of drug abuse. It would help focus and modify the drug education programs which are required by statute in the State of Texas in grades five through twelve. It would aid public service agencies in planning programs in drug abuse. It would provide data for public education so that the general public can be aware of the extent of the problem in Houston.

HERNDON, B.L., BAEDER, D.H. and RINGLE, D.A. Antagonism of morphine analgesia by morphine-pellet implanted rabbit serum. Federation Proceedings (in press)

For abstract, see Section III. Mechansims of Action of Different Drugs.

HIGBEE, K.L. What is the "fear" in a fear-arousing appeal? Psychological Reports 35: 1161-1162 (1974)

Studies of the effectiveness of threat, or fear-arousal, in persuasion seem to have assumed that the same variable was being investigated even though different kinds of fear may have been aroused and different measures of fear were used. These different kinds of fear may be grouped in two categories: (a) an affective nausea-type fear and (b) a more cognitive concern-type fear. Responses of 60 junior-high and 126 college students to communications on the dangers of marijuana were obtained on five measures used previously: fear, anxiety, nausea, worry, and concern. rs among measures were significant (p less than .01), but fear, anxiety, nausea, and worry showed high intercorrelations, while concern showed lower correlations with the other four measures. The findings are consistent with the suggestion that there may have been different kinds of "fear" involved in research on fear appeals.

HO, I.K., LOH, H.H. and WAY, E.L. Cyclic adenosine monophosphate antagonism of morphine analgesia. The Journal of Pharmacology and Experimental Therapeutics 185: 336-346 (1973)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

HO, I.K., LOH, H.H. and WAY, E.L. Influence of GABA on morphine analgesia, tolerance and physical dependence. Proceedings of the Western Pharmacological Society 16: 4-7 (1973)

HO, I.K., LU, S.E., STOLMAN, S., LOH, H.H. and WAY, E.L. Influence of p-chlorophenylalanine on morphine tolerance and physical dependence and regional brain serotonin turnover studies in morphine tolerant-dependent mice. The Journal of Pharmacology and Experimental Therapeutics 182(1): 155-165 (1972)

The administration of p-chlorophenylalanine (pCPA) inhibited partially the development of tolerance to and physical dependence on morphine induced by morphine pellet implantation in the mouse and rat. Tolerance inhibition by pCPA was evidenced by the decreased amount of morphine necessary to produce analgesia and by the reduction in dependence by the increase in the amount of naloxone necessary to induce precipitated withdrawal jumping after pCPA treatment. Further evidence that pCPA reduced dependence development on morphine was indicated by the fact that pCPA decreased the loss in body weight that occurred after abrupt morphine withdrawal. Regional studies of serotonin turnover in four brain areas indicated that tolerant-dependent mice exhibited higher serotonin levels after pargyline than nontolerant controls, especially in the hypothalamus and brain stem.

HOLLANDER, C., editor. Collection of Background Papers on Student Drug Involvement. Washington, D.C.: United States National Student Association, 1967.

HOLLISTER, L.E. Propranolol in withdrawal from opiates. Archives of General Psychiatry 31: 695-698 (November, 1974)

We used three different studies involving patients undergoing detoxification to evaluate the worth of propranolol hydrochloride in withdrawal of opiates. If propranolol acts as a narcotic antagonist, the patient's condition should become worse and require increased methadone hydrochloride; if it were to afford symptomatic relief by blocking autonomic responses, methadone requirements might be decreased. None of the studies indicated that propranolol hydrochloride in doses of 160 mg/day or less aggravated withdrawal symptoms. Patients treated with the drug consistently required a somewhat smaller methadone dose for detoxification. Patients who responded favorably had mild withdrawal symptoms. The small benefit from the drug hardly merits its consideration as an adjunct to the treatment of withdrawal from opiates.

HOLTZMAN, S.G. Behavioral effects of profadol in the rat. Psychopharmacologia 34: 135-142 (1974)

For abstract, see Section IV. Behavioral Studies.

HOLTZMAN, S.G. Behavioral effects of separate and combined administration of naloxone and d-amphetamine. The Journal of Pharmacology and Experimental Therapeutics 189(1): 51-60 (1974).

For abstract, see Section IV. Behavioral Studies.

HOLTZMAN, S.G. Interactions of pentazocine and naloxone on the monoamine content of discrete regions of the rat brain. Biochemical Pharmacology 23: 3029-3035 (1974)

For abstract, see Section IV. Behavioral Studies.

HOLTZMAN, S.G. Narcotic antagonists as stimulants of behavior in the ra and nonspecific effects. Narcotic Antagonists. Edited by M.C. Br L.S. Harris, E.L. May, J.P. Smith and J.E. Villarreal. Advanc Biochemical Psychopharmacology, Vol. 8. New York: Raven Press

For abstract, see Section IV. Behavioral Studies.

HOLTZMAN, S.G. and JEWETT, R.E. Some actions of pentazocine on bel and brain monoamines in the rat. The Journal of Pharmacology an Experimental Therapeutics 181(2): 346 (1972)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

HOLTZMAN, S.G. and JEWETT, R.E. Stimulation of behavior in the rat by cyclazocine: Effects of naloxone. The Journal of Pharmacology and Experimental Therapeutics 187(2): 380 (1973)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

HUGHES, J., KOSTERLITZ, H.W. and LESLIE, F.M. Assessment of the agonist and antagonist activities of narcotic analgesic activities of narcotic analgesic drugs by means of the mouse vas deferens. British Journal of Pharmacology 51: 139-140 (1974)

HUNT, H.F. Problems of motivation and behavior in narcotics addiction. Catalogue of Selected Documents in Psychology 3(Supplement): 54-55 (1973)

In this paper major features of the motivational and behavioral matrices that lead to and maintain narcotics addiction are summarized. Such addictions appear to depend fundamentally on two pillars: search for pleasure and avoidance of discomfort. The developmental sequences found in the acquisition of addiction are reviewed, motivational factors coming into play at crucial junctures are described, and the relative contributions of search for pleasure and avoidance of discomfort at each are considered. The roles of abstinence (both unconditioned and conditioned) and of personality dynamics are considered in relation to the high probability of relapse after detoxifying treatment. Difficulties encountered in methadone and heroin maintenance and in the therapeutic use of narcotic antagonists are considered in the light of the motivational, behavioral, and social factors that support addiction. Finally, personality dynamics believed to contribute to addiction vulnerability are discussed. The paper is written in largely nontechnical language, and is intended as a brief but comprehensive introduction to the topic for educated lay persons.

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IWATSUBO, K., GOLD, G.J. and CLOUET, D.H. Dopamine-sensitive adenylate cyclase of the caudate nucleus of rats treated with morphine or haloperidol. The Pharmacologist 16(2): 270 (1974)

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JESPERSEN, S. and SCHEEL-KRÜGER, J. Antagonism by methysergide of the 5-hydroxytryptamine-like action of toxic doses of fenfluramine in dogs. Journal of Pharmacy and Pharmacology 22: 637-638 (1970)

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JONES, R. Significance and characteristics of drug dependence: Characteristics of drug dependence to cannabis. Chemical and Biological Aspects of Drug Dependence. Edited by S.J. Mule and H. Brill. Cleveland, Ohio: Chemical Rubber Company Press, 1972. Pp. 65-81.

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KAUFMAN, J. J., SEMO, N. M. and KOSKI, W. S. Microelectrometric titration measurement of the pK_a's, partition and drug distribution coefficients of narcotics and narcotic antagonists and their pH and temperature dependence. Journal of Medicinal Chemistry (in press)

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KERR, F. W., TRIPLETT, J. N., JR. and BEELER, G. W. Reciprocal (push-pull) effects of morphine on single units in the ventromedian and lateral hypothalamus and influences on other nuclei: With a comment on methadone effects during withdrawal from morphine. Brain Research 74: 81-103 (1974)

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KOSTERLITZ, H. W., LESLIE, F. M. and WATERFIELD, A. A. Narcotic agonist and antagonist potencies of a homologous series of N-alkyl-norketobemidones measured by the guinea pig ileum and mouse vas deferens methods. Journal of Pharmacology 27: 73-78 (1975)

For abstract, see Section I. Methodology of Drug Research.

KURLAND, A. A., HANLON, T. E. and McCABE, O. L. Naloxone and the narcotic abuser: A controlled study of partial blockade. International Journal of the Addictions 9(5): 663-672 (1974)

Within the framework of an ongoing urine monitoring program, 119 paroled narcotic addicts were randomly assigned to either urine monitoring alone (concurrent control) or to double-blind treatment with either placebo or Naloxone at a partial blockade dosage level (200 to 300 mg daily). Outcome assessments at 6 and 9 months tended to favor "pill-takers" over concurrent controls. Although there were no significant differences between placebo and Naloxone in terms of retention rates and the maintenance of complete abstinence, there was considerably less narcotic drug use by Naloxone-treated subjects. Side effects were judged to be minimal and of little consequence. The importance of motivation on the part of the addict in the narcotic antagonist approach is stressed.

KURLAND, A. A., McCABE, L. and HANLON, T. Contingent naloxone treatment of the narcotic addict: A pilot study. International Journal of the Addictions 2(1): (in press)

A group of 108 chronic heroin abusers, paroled from Maryland correctional institutions, was treated with the narcotic antagonist, naloxone, utilizing a new prescription technique. This technique, applied in the context of a community-based abstinence program, involved the administration of naloxone contingent upon evidence of narcotic drug usage. Specifically, naloxone was administered in escalating 500 mgs dosages to a daily maximum dosage of 2000 mgs. when either urine analysis indicated narcotic drug use or unexcused absences led to the suspicion of narcotic intake. Antagonist administration was then continued at the maximum blockade level until the record was clear of both direct and indirect evidence of drug abuse. This approach, incorporating a tailored and parsimonious use of naloxone, was regarded as such a distinct departure from the popular approach of continuous, daily antagonist administration, that a pilot investigation of its effectiveness was undertaken. Six month outcome data on all subjects included in the investigation are contrasted with those of an historical control group of subjects previously treated in the same clinic without naloxone administration. Both groups were equivalent on all criminal history, demographic, and prognostic variables. The group receiving contingent naloxone administration showed a significantly lower attrition (reinstitutionalization) rate (8%) compared to a non-chemotherapy reference sample (37%) for the six-month evaluation period. Moreover, the "total abstinence" rates for the same six-month period were considerably in favor of the naloxone group, 38% vs. 12%. The contingent approach to the use of naloxone is discussed in relation to the traditional daily administration procedure, the rationale for which is anchored in a conditioning-extinction paradigm. The paper concludes with clinical impressions about patient acceptability of the procedure and direction for future research.

LEAFE, T. D., SARNER, S. F., WOODLAND, J. H. R., YOLLES, S., BLAKE, D. A. and MEYER, F. J. Injection method for delivery of long-acting narcotic antagonists. Narcotic Antagonists. Edited by M. C. Braude, L. S. Harris, E. L. May, J. P. Smith and J. E. Villarreal. Advances in Biochemical Psychopharmacology Vol. 8. New York: Raven Press, 1973.

For abstract, see Section I. Methodology of Drug Research.

LEANDER, J. D., McMILLAN, D. E. and HARRIS, L. S. Effects of narcotic agonists and antagonists on schedule-induced water and morphine ingestion. The Journal of Pharmacology and Experimental Therapeutics (in press)

LINDER, C. and FISHMAN, J. Narcotic antagonists. 1. Isomeric sulfate and acetate esters of naloxone (N-allylnoroxymorphone). Journal of Medicinal Chemistry 16(5): 553-556 (1973)

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McCABE, L., HANLON, T., SAVAGE, C., SHOCK, H., KURLAND, A. and BOGAN, P. Contingent naloxone treatment of the narcotic abuser: Studies of two patient samples. Proceedings of the 5th International Institute on the Prevention and Treatment of Drug Dependence. Lausanne, Switzerland: International Council on Alcohol and Addictions (in press)

McMILLAN, D. E. and MORSE, W. H. Some effects of morphine and morphine antagonists on schedule-controlled behavior. The Journal of Pharmacology and Experimental Therapeutics 157(1): 175-184 (1967)

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MELLETT, L.B. and STROBEL, J. An electrophoretic study of acute and chronic drug effects. Bulletin, Problems of Drug Dependence 30: 5376-5391 (1968)

MOORE, S. R. The last article on drug abuse education. The Carolina Journal of Pharmacy (March, 1974)

MOORE, S. R. The practicing pharmacist and the state plan for drug abuse prevention. The Carolina Journal of Pharmacy (August, 1973)

MORETON, J. E., ROEHRS, T. and KHAZAN, N. Duration of blockade by naloxone and naltrexone of EEG and behavioral effects of morphine injections in the rat. The Pharmacologist 16: 248 (1974)

Female Wistar rats were prepared with chronic cortical and muscle electrodes and i.v. cannulas. Injections of naloxone or naltrexone (EN-1639A) were administered s.c. at 12 noon, and 30 to 60 minutes later i.v. injections of morphine were delivered automatically every 5 minutes (hourly dose of 2.5 mg/kg). Injections of morphine were discontinued upon the emergence of morphine-induced EEG and behavioral changes which included suppression of sleep and rapid eye movement sleep, and occurrence of EEG slow bursts. Pretreatment with naloxone, 2, 4, 8 or 16 mg/kg produced a dose-related blockade of morphine effects, permitting normal sleep, REM sleep and awake activity for 2.7 ± 0.4, 2.6 ± 0.2, 4.8 ± 0.5 and 5.6 ± 0.4 hours, respectively. The duration of blockade provided by naltrexone at intermediate doses was about twice that of naloxone. One, 2, 4, or 8 mg/kg naltrexone blocked morphine effects for 3.0 ± 0.4, 3.9 ± 0.6, 6.6 ± 0.8 and 8.3 ± 0.2 hours, respectively. It is concluded that the experimental design used permits delineation of the pharmacodynamics of narcotic antagonists.

MORETON, J. E., YOUNG, G. A., MELTZER, L. and KHAZAN, N. Effects of naloxone on post-addict rats relapsing to morphine self-administration. Presented at Federation Meetings, Atlantic City, New Jersey, April, 1975.

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MUDGILL, L., FRIEDHOFF, A. J. and TOBEY, J. Effect of intraventricular administrations of epinephrine, norepinephrine, dopamine, acetylcholine and physostigmine on morphine analgesia in mice. Archives internationales de Pharmacodynamie et de Therapie 210: 85 (1974)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

MUSHLIN, B., GRELL, R. and COCHIN, J. Blockade of the development of tolerance to morphine by concurrent naloxone administration. The Pharmacologist 16: 194 (1974)

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NIELSEN, E.B. and LYON, M. Drinking behaviour and brain dopamine: Antagonistic effect of two neuroleptic drugs (pimozide and spiramide) upon amphetamine- or apomorphine-induced hypodipsia. Psychopharmacologia 33: 299-308 (1973)

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PARKER, R.B. Mouse locomotor activity: Effect of morphine, narcotic antagonists, and the interaction of morphine and narcotic antagonists. Psychopharmacologia 38: 15-23 (1974)

Morphine-induced locomotor activity in mice has been investigated but there appear to be only a small number of reports on the effects of narcotic antagonists on this increased activity. Also, it is well known that some narcotic antagonists can act as both morphine antagonists and analgesics in nociceptive assays, but there have been few demonstrations of this stimulant and antagonistic action with locomotor activity studies. In this study, six compounds (cyclazocine levallorphan, diprenorphine (M-5050), nalorphine, naloxone, and naltrexone) have been investigated in regard to their activity as antagonists of morphine-induced locomotor activity and in regard to their ability to stimulate locomotor activity themselves. All six compounds antagonized the effect of morphine, but only cyclazocine and levallorphan produced any significant stimulation of locomotor activity by themselves at the doses tested. This study indicates that changes in mouse locomotor activity can be used successfully to monitor the interaction between morphine and narcotic antagonists and that locomotor activity studies can also be used to study the stimulant (agonist) properties of narcotic antagonists.

PASTERNAK, G.W., WILSON, H.A. and SNYDER, S.H. Differential effects of protein modifying reagents on receptor binding of opiate agonists and antagonists. Molecular Pharmacology (in press)

PERT, C.B., PASTERNAK, G. and SNYDER, S.H. Opiate agonists and antagonists discriminated by receptor binding in brain. Science 182: 1359-1361 (December, 1973)

PERT, C.B. and SNYDER, S.H. Opiate receptor binding of agonists and antagonists affected differentially by sodium. Molecular Pharmacology 10: 868-879 (1974)

For abstract, see Section II. Drug Chemistry and Metabolism.

PRATHER, J.E. and FIDELL, L.S. Patient sex differences in the content and style of medical advertisements. Social Science & Medicine (in press)

This study focuses on the relationship between sex differences in medical advertisements for drugs and physician attitudes as these attitudes are influenced by and/or reflected in drug advertisements. The sex of the patient is a salient variable because there are sex differences in the extent, type, and source of drugs in use.

PRATHER, J.E. and FIDELL, L. Put her down and drug her up! Presented at American Sociology Association, New Orleans, Louisiana, August, 1972.

QUOCK, R. M. and HORITA, A. The interaction of naloxone with apomorphine induced hyperthermia in rabbits. Proceedings of the Western Pharmacological Society 16: 68 (1973)

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RESNICK, R. B., FINK, M. and FREEDMAN, A. M. Cyclazocine treatment of opiate dependence: A progress report. Comprehensive Psychiatry 12(6): 491-502 (November, 1971)

ROBBINS, T., ANTHONY, D. and CURTIS, T. Youth culture religious movements: Evaluating the integrative hypothesis. Sociological Quarterly (February, 1975)

This paper assesses the "integrative hypothesis" as an aid to understanding the current emergence of new religious movements appealing mainly to young persons. Four ways in which these movements reintegrate young persons. Four ways in which these movements reintegrate young persons into the social system are identified: adjustive socialization, combination, compensation, and redirection. The limitations of each of these as an explanation for the integrative consequences of youth culture religious movements are discussed. A distinction is made between adaptive movements which appear to actually reassimilate social "drop-outs" into conventional instrumental routines, and marginal movements which appear to take converts out of conventional roles and routines, but which also perform latent tension management functions for the social system. The correlated properties of adaptive and marginal movements and the tendency for marginal movements to evolve into adaptive movements are discussed. Finally, the problem of "reductionism" in analyzing religious movements in terms of their latent integrative "functions" is discussed.

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SCHEEL-KRÜGER, J. Pharmacological studies on a counter-balancing adrenergic-cholinergic system in the brain. Acta Physiologica Scandinavica 330 (Supplement): 66 (1969)

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SCHWARTZ, A.S. and MARCHOK, P. L. Depression of morphine-seeking behavior in the rat by haloperidol. Committee on the Problems of Drug Dependence. Washington, D.C.: National Academy of Sciences, National Research Council, 1974.

SEGAL, B. and MERENDA, P. F. Locus of control, sensation seeking, and drug and alcohol use in college students. Drug Forum (in press)

This report consists of a series of interrelated studies, each of which tests specific hypotheses related to drug use, alcohol use, and nonuse of either, and the personality constructs of sensation seeking and locus of control. Since the data collection differed slightly for each of the studies, and since each study addressed itself to a specific problem, the studies are presented as individual research projects. Each study has its own rationale and conclusions and is cited in the order in which it was conducted, together with summaries which interrelate the specific findings.

SHARKAWI, M. and GOLDSTEIN, A. Antagonism by physostigmine of the "running fit" caused by levorphanol, a morphine congener, in mice. British Journal of Pharmacology 37(1): 123-128 (September, 1969)

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SMITH, C. B. Neurotransmitters and the narcotic analgesics. Chemical and Biological Aspects of Drug Dependence. Edited by S. J. Mule and H. Brill. Cleveland, Ohio: Chemical Rubber Company Press, 1972. Pp. 495-504.

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SMITH, C. B., SHELDON, M. L., BEDNARCZYK, J. H. and VILLARREAL, J. E. Morphine-induced increases in the incorporation of ^{14}C-tyrosine into ^{14}C-dopamine and ^{14}C-norepinephrine in the mouse brain: Antagonism by naloxone and tolerance. The Journal of Pharmacology and Experimental Therapeutics 180(3): 547-557 (1972)

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Student Association for the Study of Hallucinogens, Inc. CNS depressants. A STASH literature review. Grassroots (November, 1974 Supplement)

Student Association for the Study of Hallucinogens, Inc. Different strokes for different folks. The multimodality approach to the management of narcotics addiction. A STASH literature review. Grassroots (November, 1973 Supplement)

Student Association for the Study of Hallucinogens, Inc. The relationship between drug advertising and drug misuse. A STASH literature review. Grassroots (January, 1974 Supplement)

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Student Association for the Study of Hallucinogens, Inc. STASH notes: Phenyclidine (PCP). STASH Capsules 5(2) (April, 1973)

TAKEMORI, A.E. Biochemistry of drug dependence. Annual Review of Biochemistry 43: 15-33 (1974)

TAKEMORI, A.E. Determination of pharmacological constants: Use of narcotic antagonists to characterize analgesic receptors. Narcotic Antagonists. Edited by M.C. Braude, L.S. Harris, E.L. May, J.P. Smith and J.E. Villarreal. Advances in Biochemical Psychopharmacology, Vol. 8. New York: Raven Press, 1973.

TSENG, L.F., LOH, H.H., HO, I.K. and WAY, E.L. The role of brain catecholamines in naloxone-induced withdrawals in morphine-dependent rats. Proceedings of the Western Pharmacological Society 17: 178-183 (1974)

TULUNAY, F.C., SPARBER, S.B. and TAKEMORI, A.E. The role of dopaminergic stimulation and blockade on the nociceptive and antinociceptive responses of mice. European Journal of Pharmacology (in press)

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TULUNAY, F.C. and TAKEMORI, A.E. Dopaminergic system and analgesia. The Pharmacologist 16: 248 (1974)

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VAILLANT, G.E. A comparison of antagonists of physostigmine-induced suppression of behavior. The Journal of Pharmacology and Experimental Therapeutics 157(3): 636-648 (1967)

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VILLARREAL, J.E. The effects of morphine agonists on morphine-dependent rehesus monkeys. Agonist and Antagonist Actions of Narcotic Analgesic Drugs. Edited by H.W. Kosterlitz, H.O.J. Collier, J.E. Villarreal. Baltimore, Maryland: Baltimore University Park Press, 1973. Pp. 73-93.

VILLARREAL, J.E. A suggested procedure for evaluating the dependence liability of morphine-like compounds with mixed agonist-antagonist properties. Committee on Problems of Drug Dependence. Washington, D.C.: National Academy of Sciences, National Research Council, 1969. Pp. 6015-6028.

VOLAVKA, J., ZAKS, A., ROUBICEK, J. and FINK, M. Electrographic effects of diacetylmorphine (heroin) and naloxone in man. Neuropharmacology 9: 587-593 (1970)

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WAINER, B.H., FITCH, F.W., ROTHBERG, R.M. and SCHUSTER, C.R. In vitro morphine antagonism by antibodies. Nature 241: 537-538 (February, 1973)

WAX, J., NUITE, J.A., TESSMAN, D.K., JORDAN, J.H., JR., McLEAN, J.R. and McCARTHY, D.A. Antinociceptive agonist and antagonist activities of reference agents and new compounds in rodents. Report of the 36th Annual Scientific Meeting of the Committee on Problems of Drug Dependence, Mexico City, Mexico, March 10-14, 1974. Pp. 1150-1159.

Eight compounds submitted under code number by the NIMH Center for Studies of Narcotics and Drug Abuse were evaluated for antinociceptive and morphine antagonist activity by the subcutaneous route in rodents. DAC-26-4 was ca. 0.025 times as potent as morphine in inhibiting phenylquinone writhing in mice (ED_{50} = 16 (7.6 to 33) 95% mg base/kgm). The other compounds were substantially devoid of activity at reasonably subtoxic dose levels. Antagonist activity was determined as potency relative to naloxone in antagonizing morphine-elevated thresholds to tail pressure in rats. In descending order of activity, the relative potencies are: naltrexone, 2.5 (1.8 to 3.4) 95%; naloxone, 1; DAC-26-4, 0.77 (0.60 to 0.99) 95%; DAC-1412, ca. 0.4; DAC-28-4, 0.27 (0.22 to 0.32) 95%; NIH-8773, ca. 0.25; DAC-27-4, 0.14 (0.10 to 0.19) 95%. DAC-8-7, EMY-121 and EMY-122 showed no activity at doses 170 times greater than effective levels of naloxone.

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WAY, E.L. and SETTLE, A. Multiapplications of narcotic antagonists. Rational Drug Therapy (in press)

WEI, E., LOH, H.H. and WAY, E.L. Neuroanatomical correlates of morphine dependence. Science 177: 616-617 (August, 1972)

WILSON, H.A., PASTERNAK, G.W. and SNYDER, S.H. Differentiation of opiate agonist and antagonist receptor binding by protein modifying reagents. Nature (in press)

WINBURN, G.M. and HAYS, J.R. Dropouts: A study of drug use. Journal of Drug Education 4(2): 249-254 (Summer, 1974)

A group of 144 high school dropouts were surveyed in an effort to study the prevalence and correlates of their drug use as compared to that of 2,277 high school students. Tobacco (74%) and alcohol (71%) were reported to be the most used of nine categories of substances included in the survey. Next highest categories of use were of marijuana (38%) and stimulants (31%). The category of drugs with the lowest overall reported use was opiates or cocaine, with 11.9 per cent of the dropouts reporting use. The results were reported according to grade level, sex, and ethnicity.

WINTER, J.C. Behavioral effects of n, n-diethyltryptamine: Absence of antagonism by xylamidine tosylate. The Journal of Pharmacology and Experimental Therapeutics 169(1): 7 (1969)

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WOODLAND, J.H.R., YOLLES, S., BLAKE, D.A., HELRICH, M. and MEYER, F.J. Long-acting delivery systems for narcotic antagonists. Journal of Medicinal Chemistry 16(8): 897-901 (1973)

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WOODS, J.H., DOWNS, D.A. and VILLARREAL, J.E. Changes in operant behavior during deprivation- and antagonist-induced withdrawal states. Psychic Dependence. Edited by L. Goldberg and F. Hoffmeister. New York: Springer-Verlag, 1973.

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YOLLES, S., ELDRIDGE, J., LEAFE, T., WOODLAND, J.H.R., BLAKE, D.R. and MEYER, F. Long-acting delivery systems for narcotic antagonists. Controlled Release of Biologically Active Agents. Edited by A.C. Tanquary and R.E. Lacey. New York: Plenum Press, 1974. Pp. 177-193.

YOLLES, S., ELDRIDGE, J.E. and WOODLAND, J.H.R. Sustained delivery of drugs from polymer/drug mixtures. Polymer News 1(4-5): 9-15 (1970)

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ZAKS, A.M., BRUNER, A., FINK, M. and FREEDMAN, A.M. Intravenous diacetylmorphine (heroin) in studies of opiate dependence. Diseases of the Nervous System 30(Supplement): 89-92 (1969)

ZAKS, A., JONES, T., FINK, M. and FREEDMAN, A.M. Naloxone treatment of opiate dependence. Journal of the American Medical Association 215(13): 2108 (March, 1971)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

VII

Treatment-Related Research

VII. Treatment-Related Research

AMINI, F. and SALASNEK, S. Adolescent drug abuse: Search for a treatment model. Comprehensive Psychiatry (in press)

The search for an effective form of treatment for the adolescent drug abuser has brought the authors to a conceptual model which is presented here. The attempt is made to delineate an approach and to assess its strengths and weaknesses on the basis of the experience gained on a Youth Drug Unit that has been in operation for nearly seven years.

BABST, D.V., CHAMBERS, C.D. and WARNER, A. Patient characteristics associated with retention in a methadone maintenance program. British Journal of the Addictions 66: 195-204 (1971)

The purpose of this study was to determine if it is possible to differentiate between types of patients as to their ability to stay in a methadone maintenance program. The study is based on most first admissions (679 cases) to the Dole-Nyswander Methadone Maintenance Program from its beginning in 1964 to March 15, 1968. Each patient was followed up to determine whether he was still in the program 2 years later. This meant the last admissions were followed to March 15, 1970. Eighty percent of both males and females were still in the program 2 years or longer. Those patients who did poorly were those who had longer conviction records, were multiple drug users, abused alcohol, were not employed at admission, were older, and were not married. It was shown that patients with combinations of the above characteristics had lower retention rates than those identified by one factor at a time.

BAKER, W.W. and KRATKY, M. Suppression of hippocampal DFP discharges by chlorpromazine, imipramine and desipramine. Archives internationales de Pharmacodynamie et de Therapie 189: 109-122 (1971)

Acute effects of chlorpromazine, imipramine, or desipramine administered i.v. or microinjected intrahippocampally (I. H.) were studied on continuous hippocampal discharges; these discharges of cholinergic origin were established by I. H. microinjection of the anticholinesterase diisopropylfluorophosphate (DFP). When administered i.v. all three agents, without initially stimulating, reduced the intensity and subsequently abolished the discharges. Modification of the extrahippocampal inputs was suggested as an indirect mechanism through which the psychotropic drugs reduced the excitability of the hippocampus; however, they also acted directly on the hippocampus to alter local activity. At small I. H. doses each drug enhanced the discharges, but at higher cumulative doses totally suppressed all activity. Desipramine produced also an early transitional phase of cycling with alternate periods of waxing and waning of the discharges. Suppression of the discharges by the psychotropic drugs was attributed to an hypothesized local stabilizing effect involving norepinephrine as well as to a central cholinolytic action. It is concluded that in this system the psychotherapeutic drugs chlorpromazine, imipramine and desipramine differ only quantitatively from one another in stabilizing hippocampal activity.

BAKER, W.W., YOUNG, R.L. and KRATKY, M. Analysis of the effects of hydromorphine on hippocampal excitability and their antagonism by levallorphan and naxolone. Fifth International Congress on Pharmacology, San Francisco, California, 1972. P. 13.

BALDWIN, B.A., LIPTZIN, M.B. and GOLDSTEIN, B.B., JR. Youth services: A multifaceted community approach to drug abuse. American Journal of Psychiatry 24(10): 695-697 (October, 1973)

The increase in drug abuse in the 1960s prompted the establishment of numerous telephone hotlines and drop-in crisis centers. As the number of acute drug crises has abated, such facilities are expanding their services to deal with other problems of youth. In Chapel Hill, North Carolina, the drug-crisis center has evolved into a multiservice center, and its sponsors have also established two other programs, a residential center for heroin addicts and a foster home for runaways. Peer counselors in the facilities have proved valuable in helping disturbed youths.

BLUMBERG, A.G., COHEN, M., HEATON, A.M. and KLEIN, D.F. Covert drug abuse among voluntary hospitalized psychiatric patients. Journal of the American Medical Association 217(12): 1659-1661 (September, 1971)

A survey of 332 young psychiatric patients, by means of repeated urinary chromatographic analyses, revealed that at least 60% of these patients employed abusable drugs while hospitalized. Barbiturates were detected most frequently, and addiction did not occur among patients who remained in the hospital. The high incidence of drug abuse in hospitalized patients must be considered in the light of alterations of psychiatric states and in the interpretation of treatment results. The chromatographic screening of the urine of hospitalized patients for nonprescribed drugs is recommended.

BOND, D.D., BRACELAND, F.J., FREEDMAN, D.X., FRIEDHOFF, A.J., KOLB, L.C. and LOURIE, R.S., editors. The Year Book of Psychiatry and Applied Mental Health 1971. Chicago: Year Book Medical Publishers, Inc., 1971.

For abstract, see Section V. Adverse Effects, Toxicity and Genetic Effects.

BOUDIN, H.M. Contingency contracting as a therapeutic tool in the deceleration of amphetamine use. Behavior Therapy 3(4): 604-608 (October, 1972)

This study illustrates the use of contingency contracting in the treatment of drug abuse. Miss X had been a heavy user of amphetamines. A small portable shock dispenser and a contingency contract were used in the treatment. Due to its unreliability, the use of the shock dispenser was cancelled.

The contingency contract was used for a 3-month period, during which time there was only one remission, and a 2-year followup indicates no return to amphetamine use.

BOUDIN, H.M. and VALENTINE, V.E., III. Behavioral techniques as an alternative to methadone maintenance. Advances in Behavioral Therapy (in press)

BOWERS, M.B., JR. Clinical measurements of central dopamine and 5-hydroxytryptamine metabolism: Reliability and interpretation of cerebrospinal fluid acid monoamine metabolite measures. Neuropharmacology 11: 101-111 (1972)

Concentrations of 5-hydroxyindoleacetic acid and homovanillic acid were measured with and without probenecid pretreatment in the lumbar cerebrospinal fluid of psychiatric patients and inmate controls. Values were obtained for the errors of the methods (both 5-hydroxyindoleacetic acid and homovanillic acid), and for intra-individual variation among some sequential samples. Baselines values for 5-hydroxyindoleacetic acid and homovanillic acid correlated positively with the increment after probenecid in individual subjects. Following the administration of probenecid, cerebrospinal fluid 5-hydroxyindoleacetic acid and homovanillic acid showed a significant positive correlation. In clinical studies, not only absolute values for these cerebrospinal fluid acid amine metabolites but also their ratio must be considered in the interpretation of results. The use and interpretation of these measures in clinical studies is briefly reviewed.

BRACELAND, F.J., FREEDMAN, D.X., FRIEDHOFF, A.J., KOLB, L.C., LOURIE, R.S. and ROMANO, J., editors. The Year Book of Psychiatry and Applied Mental Health 1973. Chicago: Year Book Medical Publishers, Inc., 1973.

For abstract, see Section V. Adverse Effects, Toxicity and Genetic Effects.

BRACELAND, F.J., FREEDMAN, D.X., FRIEDHOFF, A.J., LOURIE, R.S. and ROMANO, J., editors. The Year Book of Psychiatry and Applied Mental Health 1972. Chicago: Year Book Medical Publishers, Inc., 1972.

For abstract, see Section V. Adverse Effects, Toxicity and Genetic Effects.

BRILL, L. and CHAMBERS, C.D. Summary and conclusions: Status of methadone therapy. Methadone: Experiences and Issues. Edited by C.D. Chambers and L. Brill. New York: Behavioral Publications, 1973. Pp. 349-366.

The state of the practice of methadone therapy is discussed. The philosophic concepts governing the Dole-Nyswander Methadone Approach are presented, including the metabolic deficiency concept and the narcotic blockade concept. Some pharmacological questions concerning the use of methadone are reviewed. Various philosophical aspects of methadone stabilization and maintenance are examined. Illicit diversion of methadone and retention rates and success of methadone maintenance are summarized.

BROTMAN, R. Drug abuse: The dilemma of the criminal-sick hypothesis. Drugs and the Brain. Edited by P. Black. Baltimore, Maryland: The Johns Hopkins Press, 1969. Pp. 371-377.

The problem of drug abuse has completed the cycle of a "self-fulfilling prophecy." From its origins as a medical problem, it was legislatively defined as a crime. A major result was the withdrawal of the medical profession from the treatment of users. The difficulties of the addict were greatly complicated by the criminal stigma conferred on him, by the criminal role he was forced to play, and by the punitive treatment he received.

The recent introduction of the disease concept of drug abuse has resulted in even more ambivalence toward the addict. He is viewed simultaneously as a criminal and a sick person in need of medical treatment. Certainly, some users fit these roles, but to apply these definitions as blanket descriptions of all addicts is to engage in unjustifiable stereotyping.

Erroneous assessments of the drug abuse phenomenon have arisen from a failure to examine the associated social parameters. The community mental health approach views the problem as an interaction between the individual, the drug, and the environment.

BROTMAN, R.E., SHAH, R. and SUFFET, S.L. Generational differences among drug abuse patients. International Journal of the Addictions 7(2): 219-235 (1972)

Our study shows that there are several recognizable and measurable generational differences between the younger and older patients in the DCMH drug program. They tend to indicate that the younger group (1) contains a greater proportion of middle class persons and (2) is more volatile than the older; this may be a reflection of generational differences in all of American society. However, additional studies are needed to determine whether similar differences occur among the patient populations of other programs.

BROTMAN, R. and SUFFET, S.L. Marijuana use and social control. Annals of the New York Academy of Sciences 191: 235-245 (December, 1971)

Our purpose in this paper is to review some of the current trends in the social control of marijuana use and certain of the issues that surround efforts at control. We shall discuss four major formal types of control: treatment, economic blockade, education, and law.

BROTMAN, R. and SUFFET, S.L. Youthful Drug Use. Washington, D.C.: U.S. Government Printing Office, 1970.

BROWN, B.S., BENN, G.J. and JANSEN, D.R. Methadone maintenance, neither friend nor foe - some client opinions. American Journal of Psychiatry (in press)

BROWN, B.S., JACKSON, C.S. and BASS, U.F., III. Methadone and abstinent clients in group counseling sessions. International Journal of the Addictions 8(2): 309-316 (1973)

Study was made of the roles played by methadone clients (N=23) and by abstinent clients (N=33) at counseling sessions attended by both. In addition, opportunity was taken to study the activities of ex-addict counselors (N=3) at these same sessions. Using Bales' Interaction Process Analysis, data were gathered on the contributions made by members of three different treatment groups. A total of 15 sessions were observed in this way. Significant differences were found between methadone and abstinent clients in the numbers and kinds of communication made by each. Not only did methadone clients make more contributions than did abstinent clients, but their contributions were more likely to be weighted toward support of other group members and toward efforts to solicit ideas and feelings from others as well as toward the expression of their own ideas, feelings, and suggestions for group activity. The contributions of abstinent clients were weighted toward expressions of rejection and of open antagonism toward other group members. Thus, methadone clients appeared more largely supportive of the work to be done in the group counseling sessions and more largely involved in that work. Differences between ex-addict and nonaddict counselors, while suggestive only, support a view that ex-addict counselors take a far more active role in group sessions than do nonaddict counselors and are more likely to express their own opinions and feelings, while nonaddict counselors are more likely to give support to others and relieve tension.

BROWN, B.S., JANSEN, D.R. and BASS, U.F., III. Staff attitudes and conflict regarding the use of methadone in the treatment of heroin addiction. American Journal of Psychiatry 131(2): 215-219 (February, 1974)

Realizing that attitudes toward drug use held by staff members of methadone maintenance clinics have a strong influence on the treatment given, the authors sampled the opinions of ex-addict counselors maintained with methadone, ex-addict counselors who were abstinent, nonaddict counselors, and administrative and supervisory staff. The staff uniformly viewed methadone maintenance as preferable to the use of heroin but as significantly less desirable than the person's functioning without drugs. The implications of these attitudes for treatment are discussed.

BROWN, B.S., JANSEN, D.R. and BENN, G.J. Changes in attitudes regarding the use of methadone in treatment by staff and clients. Presented at the National Drug Abuse Conference, Chicago, Illinois, March 31, 1974.

BROWN, B.S., JANSEN, D.R. and BENN, G.J. Changes in attitudes toward methadone. Archives of General Psychiatry (in press)

Staff and client attitudes toward heroin users and toward maintenance and abstinent clients were assessed in 1970 and again in 1973. On each occasion there was striking agreement between the ratings made by staff and client groups. Abstinent clients were rated by all groups as significantly more effective and more responsible than either maintenance clients or heroin users; maintenance clients were rated as more conservative, self-conscious and self-effacing then were the other groups. While heroin users and abstinent clients were characterized similarly in the two rating periods, raters in the 1973 survey viewed methadone clients as more passive and less inclined to undertake adult responsibilities than was true of raters in the 1970 survey.

BROWNE-MAYERS, A.N., SEELYE, E.E., SEIXAS, F. and STOKES, P. Alcoholism and drug abuse. Chapter 25 of Progress in Neurology and Psychiatry, Vol. 28. Edited by E.A. Spiegel. New York: Grune and Stratton, Inc., 1973. Pp. 449-467.

BUCCI, L., FUCHS, M., SIMEON, J. and FINK, M. Depot fluphenazine in the treatment of psychosis in a community mental health clinic. Diseases of the Nervous System 31(9 Supplement): 28-31 (1971)

CHAMBERS, C.D. Characteristics of attrition during ambulatory detoxification. Methadone: Experiences and Issues. Edited by C.D. Chambers and L. Brill. New York: Behavioral Publications, 1973. Pp. 195-202.

Prediction of which addict patients will terminate the detoxification process before it is completed is discussed in terms of personal, social and historical factors. Results show that the greater the amount of formal education, the greater potential for remaining in treatment. It was found that addicts who concurrently abuse multiple drugs will correctly perceive of their detoxification as being more difficult and requiring more time. The abuser of only heroin can more readily ascertain when his addiction or detoxification becomes personally manageable and is more likely to judge for himself when treatment should terminate.

CHAMBERS, C.D., BABST, D.V. and WARNER, A. Characteristics predicting long-term retention in a methadone maintenance program. Proceedings of the Third National Conference on Methadone Treatment, National Institute of Mental Health, Rockville, Maryland, November 14-16, 1970. Pp. 140-143.

A study to isolate those attributes of drug addicts most closely associated with continuing in a methadone treatment program utilized single factor and multifactor techniques to analyze the 679 patient population admitted to the Dole-Nyswander program from 1964 to March, 1968. A single factor analysis revealed that continuing in treatment was not related to the sex or marital status of the patient, to the multiple abuse of drugs or of alcohol, to the race or degree of education of the patients, to the age at onset of heroin use or number of prior treatments. Continuing in treatment was related to the length of abuse of narcotics and to the employment status of the patient and was marginally related to the conviction history of the patient. Patients with the least chance of remaining in treatment

Chambers, C.D., Babst, D.V. and Warner, A. continued
have some of the following characteristics: early onset age of drug use; long drug history; concurrent drug or alcohol abuse; and multiple convictions. Tables present detailed breakdowns of data in terms of reasons for termination of treatment and characteristics of patients who remain. The statistical technique of configural analysis is explained.

CHAMBERS, C.D. and BERGEN, J.J. Self-administered methadone supplementation. Methadone: Experiences and Issues. Edited by C.D. Chambers and L. Brill. New York: Behavioral Publications, 1973. Pp. 131-142.

The dimensions and characteristics of the self-administered supplementation of methadone by addict patients were studied. Statistical profiles of social characteristics of methadone supplementers are presented, and include such factors as other drugs used, employment status, race, age, sex, arrest history, treatment history, and attendance. The data show that treatment officials must have knowledge of supplementation, or attempts at detoxification will be unsuccessful.

CHAMBERS, C.D. and MOFFETT, A.D. Philadelphia drug abuse in Philadelphia: Current treatment, legislative and research activity. Yearbook of Drug-Abuse. Edited by L. Brill and E. Harms. New York: Behavioral Publications, 1973. Pp. 129-156.

Current treatment and research activities concerning drug abuse in Philadelphia are discussed. Philadelphia probably has one of the 10 largest heroin subcultures in the U.S. The major treatment programs in Philadelphia are divided into somewhat opposing modalities: The chemical substitution programs and the abstinence programs. There are 2 major chemical substitution programs in Philadelphia: The Narcotic Addict Rehabilitation Program (located at Philadelphia General Hospital) and the Young Great Society Program (located in a Black ghetto in West Philadelphia). Both groups utilize methadone, have detoxification and maintenance components, and are primarily ambulatory programs. Two major groups practice the abstinence approach to rehabilitation: Gaudenzia House and Teen Challenge. As of January 1972, there were 14 medical and social agencies providing specialized treatment for drug abusers in Philadelphia. Some agencies are attempting to provide a multimodality approach. Research programs include carbon dioxide inhalation therapy, which helps the addict to cope with the craving that occurs during heroin withdrawal.

CHAMBERS, C.D. and TAYLOR, W.J. Patterns of cheating among methadone maintenance patients. Drug Abuse: Current Concepts and Research. Edited by W. Keup. Springfield, Illinois: Charles C. Thomas, 1972. Pp. 328-336.

A urine screening and patient interview program conducted by researchers in the narcotic addiction rehabilitation program revealed a high incidence of cheating among methadone maintenance patients being served by Philadelphia General Hospital's ambulatory clinic. Almost one-third of all the long term methadone maintenance patients screened submitted urines which were dirty 100 percent of the time. Interviews clearly demonstrated the futility of attempting to elicit information from addict patients concerning their cheating. In spite of the extensive addiction careers and the extensive cheating on the maintenance program, 51.3 percent of the patients were maintaining an intact marriage, 53.8 percent were legally employed on a full-time basis, and only 28.2 percent were receiving welfare.

CHAMBERS, C.D., TAYLOR, W.J. and MOFFETT, A.D. The incidence of cocaine abuse among methadone maintenance patients. International Journal of the Addictions 7(3): 427-441 (Fall, 1972)

The incidence of cocaine abuse among methadone maintenance patients is reported. Methadone maintenance patients sell a portion of their take-home medicine to purchase cocaine. A simple and reliable urine screening method to detect the presence of cocaine is available, and when the results are presented to the cocaine cheaters, they abstain from the practice. The mean age of the cheaters in the study was 36.4 years, and that of the nonabusers was 32.1 years. The cocaine cheating population was 34.4 percent white and 65.6 percent black. Over 40 percent of all cocaine abusers were either divorced or separated. Only 18.8 percent of the cocaine abusers had been working at the time of admission compared to 44.7 percent of the nonabusers. Only 8.3 percent of all the addict patients with abuse histories of less than 10 years were cocaine cheaters, but 25.7 percent of those with more than 10 years were detected abusers of cocaine. Only 9.9 percent of the noncheaters were criminally involved, but 28.1 percent of the cocaine abusers were. Thus, it is concluded that the use of cocaine is common among narcotic addicts throughout the nation, and it is reasonable to expect these addicts to continue even after stabilization with a substitute narcotic.

CHAMBERS, C.D., TAYLOR, W.J. and WALTER, P.V. Drug abuse during ambulatory detoxification. Methadone: Experiences and Issues. Edited by C.D. Chambers and L. Brill. New York: Behavioral Publications, 1973. Pp. 203-213.

The dimensions and patterns of drug abuse during ambulatory detoxification are discussed. A major clinical disadvantage in ambulatory detoxification is the lack of control over what drugs the addict patient may continue to abuse. Statistical evidence is presented showing the percentage of weeks drugs were detected and their types and amounts. When tests reveal no methadone, it is assumed the patient is selling the medication in order to purchase other drugs.

CHAPEL, J.L. Emergency room treatment of the drug-abusing patient. American Journal of Psychiatry 130(3): 257-259 (1973)

Preferred treatment of patients appearing for emergency care with acute symptoms suggesting drug overdose or a bad trip from heroin, depressants, alcohol, stimulants, cocaine, hallucinogens, marihuana, or belladonna derivatives is suggested.

CHOULIS, N.H. and PAPADOPOULOS, H. Long acting methadone. Journal of Pharmaceutical Science (in press)

COHEN, M., BLUMBERG, A.G., KLEIN, D.F. and HEATON, A.M. Relationship between history of drug abuse and covert drug use in a psychiatric hospital. Proceedings of the 80th Annual Convention of the American Psychiatric Association, 1972.

COHEN, M. and KLEIN, D.F. Posthospital adjustment of psychiatrically hospitalized drug users. Archives of General Psychiatry 31: 221-227 (August, 1974)

This report compares the in-hospital and posthospital behavior of four groups of young psychiatric patients, those with a history of mild, moderate, or heavy drug use and those with a negative drug use history.

The measures of in-hospital behavior, covert drug use, and social affiliations, indicate that the greater the drug use prior to hospitalization, the more likely the patient was to continue drug use within the hospital and to associate primarily with other drug users.

The posthospital measure of community adjustment and degree of drug use, as determined by a six month follow-up interview, indicated that in-hospital drug use and social affiliations predict posthospital drug use only for those patients with a history of heavy drug use and that only among this latter group, is posthospital drug use related to poor post-hospital adjustment.

COHN, M.L. Acute behavioral changes induced in the rat by the intracerebroventricular administration of thyrotropin releasing factor (TRF) and somatostatin. Proceedings of the Society of Toxicology, Williamsburg, Virginia, March 9-13, 1975.

COHN, M.L. Cyclic AMP, thyrotropin releasing factor (TRF) and somatostatin-key factors in the regulation of the duration of narcosis. Molecular Mechanisms of Anesthesia. Edited by B.R. Fink. New York: Raven Press, 1975.

COHN, M.L. Dibutyryl cyclic AMP - an antidote to hypnotic, sedative and tranquilizer overdosage in the rat. Toxicology and Applied Pharmacology 25: 439 (1973)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

COHN, M.L. and COHN, M. Antianesthetic effects of cyclic AMP and analeptic drugs as determined by reversal of amobarbital-induced narcosis. Proceedings of the Society for Toxicology, Washington, D.C., March 10-14, 1974.

COHN, M.L. and COHN, M. Phentolamine - an antagonist of cyclic AMP regulation of narcosis. Proceedings of the Society for Neurosciences, San Diego, California, November 7-10, 1973.

COHN, M.L. and COHN, M. Thermoregulatory control in the rat anesthetized with amobarbital. Role of thyrotropin releasing factor. Proceedings of the American Society of Anesthesiologists, Washington, D.C., October 12-16, 1974.

COHN, M.L. and COHN, M. The role of thyrotropin releasing factor and cyclic AMP in the duration of amobarbital-induced narcosis. Proceedings of the Society for Neurosciences, St. Louis, Missouri, October 20-23, 1974.

COLLIER, W.V. A profile study on residents of Daytop Village. Journal of Drug Issues 3(1): 10-21 (1973)

COLLIER, W.V. and HIJAZI, Y.A. A follow-up study of former residents of a therapeutic community. International Journal of the Addictions 9(6): 805-826 (1974)

In an attempt to measure the outcome of the Daytop drug abuse program, a longitudinal follow-up study was initiated on former residents of the program. Interim findings indicated that most of the "graduates" and drop-outs who remained in treatment for about one year had remained drug-free and were pursuing productive life styles. In discussing some methodological problems encountered, it was pointed out that the issue of confidentiality of agency's files on former residents of Daytop led the investigators to use street sources in obtaining corroborative followup data. Finally, in commenting on the overall findings of the resident re-adjustment problems, some issues surrounding the therapeutic community re-entry process were discussed.

CONNAUGHTON, J.F., FINNEGAN, L.P., SCHUT, J. and EMICH, J.P. Current concepts in the management of the pregnant opiate addict. International Journal of Addictive Diseases (in press)

The number of young women addicted to opiates has increased markedly in the past 10 years. Accordingly, there has been a sharp rise in pregnancies complicated by addiction. The care of the pregnant addict and her newborn has become a major and controversial problem. There is a need for a specific approach to this particular high risk patient and her newborn.

A comprehensive approach to the care of 206 pregnant addicts and their infants at the Philadelphia General Hospital has significantly reduced maternal and infant morbidity heretofore associated with pregnancies complicated by opiate addiction. More significantly, the incidence of obstetrical complications has been reduced to 12% with a decrease in incidence of low birth weight to 22% and a reduction of infant morbidity to 33%.

The authors propose that application of this comprehensive type of approach to the pregnant addict is a significant factor in the successful management of these patients.

CONNAUGHTON, J.F., FINNEGAN, L.P., SCHUT, J. and EMICH, J.P. Family center program - A successful approach for the rehabilitation of pregnant women. Proceedings of the 36th Annual Meeting of Committee on Problems of Drug Dependence of the National Research Council (in press)

CUSHMAN, P., JR. Methadone maintenance treatment: An appraisal. Journal of Drug Issues 376-380 (Fall, 1974)

CUSHMAN, P., JR. Plasma testosterone in narcotic addiction. American Journal of Medicine 55: 452-458 (October, 1973)

Mean plasma testosterone levels in male heroin addicts, methadone-maintained, former methadone-maintained and abstinent addicts did not differ significantly from that of normal controls. A prospective study before and during 1 year of methadone maintenance treatment showed no change in the mean plasma testosterone levels during treatment; no correlation was observed between plasma testosterone levels and symptoms of sexual disturbances. Some untreated heroin addicts and some methadone-maintained patients had plasma testosterone values below the lower limits of normal. In the methadone-treated group there was no direct methadone dose-testosterone level relationship, although patients receiving 40 mg of methadone or less had significantly higher mean testosterone levels than those receiving more than 40 mg of methadone daily. There was no relationship between serum glutamic oxaloacetic transaminase (SGOT), presence or absence of illicit drug use, or plasma luteinizing hormone level and plasma testosterone. A significant relationship between low testosterone levels and recognized alcoholism was evident.

CUSHMAN, P., JR. Progress report on methadone. The Wall Street Journal (July 2, 1974)

CUSHMAN, P., JR. and DOLE, V.P. Detoxification of rehabilitated methadone-maintained patients. Journal of the American Medical Association 226: 747-752 (November, 1973)

Detoxification was studied in well-rehabilitated, selected, methadone-maintained patients. Seventy-nine percent of 48 patients were successfully detoxified, functioned well, and were apparently drug-free when studied months after their last methadone treatment. Twenty-one percent returned to methadone maintenance treatment because of heroin use or the withdrawal syndrome. Other patients could not be detoxified, even in a slow, flexible dose-reduction regimen. It is recommended that the primary aim of methadone treatment is to facilitate rehabilitation. Decisions regarding detoxification should be made by the physician on an individual basis, after a year or more of successful treatment after weighing the degree of rehabilitation, relapse potential, and the patient's wishes.

CUSHMAN, P., JR. and GRIECO, M.H. Hyperimmunoglobulinemia associated with narcotic addiction. American Journal of Medicine 54: 320-326 (March, 1973)

For abstract, see Section V. Adverse Effects, Toxicity and Genetic Effects.

CUSHMAN, P. and KREEK, M.J. Methadone maintained patients. New York State Journal of Medicine 74: 1970 (October, 1974)

CUSHMAN, P., JR. and SHERMAN, C. Biologic false-positive reactions in serologic tests for syphilis in narcotic addiction. American Journal of Clinical Pathology 61(3): 346-351 (March, 1974)

For abstract, see Section V. Adverse Effects, Toxicity and Genetic Effects.

DAHLBERG, C.C. The 100 minute hour. Contemporary Psychoanalysis 4: 1-18 (1967)

DAHLBERG, C.C., FELDSTEIN, S. and MECHANECK, R. Systematic research on LSD in psychoanalysis. Interpersonal Explorations in Psychoanalysis. Edited by E.G. Witenberg. New York: Basic Books, 1973.

DAHLBERG, C.C. and JAFFE, J. Need good research destroy good therapy? Science and Psychoanalysis. Edited by J.H. Masserman. New York: Grune and Stratton, 1972. Pp. 173-186.

This chapter grows out of the experiences of a project in which we gave small doses of LSD to patients in analysis. All the clinical work was done by one analyst (CCD) but there were an ex-practicing analyst (JJ), three psychologists, and a number of technicians on the team. The therapy sessions were audiotaped; 100-min. drug sessions and an active as well as an inactive placebo were used. Also, the experiment itself lasted over a period of from 16 to 22 mo. with each patient. We were interested in looking into clinical and psycholinguistic elements of the interaction as affected by LSD as opposed to the two placebos. The details of the design and findings, reported elsewhere, are not relevant to this paper. Here we are interested in certain ethical and procedural problems which relate to research in a psychoanalytic setting as we have encountered them.

DAVIS, J.M., FANN, W.E. and JANOWSKY, D.S. Problems of the drug treatment of the elderly. Psychopharmacology and the Aging Rat. Edited by W.E. Fann. New York: Plenum Press, 1973.

DAVIS, M.M., BROWN, B.S. and GLENDINNING, S.T. Neonatal effects of heroin addiction and methadone-treated pregnancies. Preliminary report on 70 live births. Proceedings of the Fifth National Methadone Conference, NAPAN, 1973.

For abstract, see Section V. Adverse Effects, Toxicity and Genetic Effects.

DAVIS, M.M. and SHANKS, B.L. Neurological aspects of perinatal narcotic addiction. Addictive Diseases: An International Journal (in press)

For abstract, see Section V. Adverse Effects, Toxicity and Genetic Effects.

DAVIS, W.M. and SMITH, S.G. Behavioral control exerted by an amphetamine based conditioned reinforcer. Clinical Toxicology 7: 272-273 (1974)

For abstract, see Section IV. Behavioral Studies.

DAVIS, W.M. and SMITH, S.G. Naloxone use to eliminate opiate-seeking behavior: Need for extinction of conditioned reinforcement. Biological Psychiatry 9(2): 181-189 (1974)

For abstract, see Section IV. Behavioral Studies.

DeLEON, G., HOLLAND, S. and RESENTHAL, M.S. Phoenix House: Criminal activity of dropouts. Journal of the American Medical Association 222(6): 686-689 (November, 1972)

A study using 358 residents of Phoenix House, a drug rehabilitation center in New York City, was undertaken to explore the relationship between criminal activity and residency in that therapeutic community. Of this sample, 254 had left the program against clinical advice (dropouts). A second group, 104 residents remained. Among volunteers who dropped out, the largest decrease in arrests was seen for subjects who remained more than 12 months in the program. Data from subjects in the volunteer group seems to suggest that dramatic decreases occur in the more incorrigible addicts. The results of the study indicate that even for those addicts who fail to complete the program, postprogram arrests remain low in comparison to their before-program levels. The reduction of criminal activity is understood best in terms of their socialization while at Phoenix House. The extent to which an addict becomes socialized depends in part on the time under the influence of the program.

DEMAREE, R.G. Behavioral measures and related criterion for assessment of outcomes during treatment for drug users in the DARP: 1969-1971 admissions. Evaluation of Treatments. Edited by S.B. Sells. Studies of the Effectiveness of Treatments for Drug Abuse, Vol. 1. Cambridge, Massachusetts: Ballinger, 1974.

DWARSHUIS, L., KNOX, M., KOLTON, M. and MADER, G. Research report: Training activities and needs in Michigan drug programs. Journal of Alternative Human Services 1(4): 43-45 (1974)

DWARSHUIS, L., KOLTON, M. and GORODEZKY, M. Role of volunteers in innovative drug treatment programs. Proceedings, 81st Annual Convention, American Psychological Association. Washington, D.C.: American Psychological Association, 1973. Pp. 967-968.

For abstract, see Section VI. Drug Use/Abuse Prevention.

DWARSHUIS, L., KOLTON, M.S. and GORODEZKY, M. The treatment approach of innovative drug programs for youth. Drug Forum 3(3): 249 (Spring, 1974)

For abstract, see Section VI. Drug Use/Abuse Prevention.

EL-YOUSEF, M.K., JANOWSKY, D.S., DAVIS, J.M. and SEKERKE, H.J. Reversal of antiparkinsonian drug toxicity by physostigmine: A controlled study. American Journal of Psychiatry 130(2): 141-145 (February, 1973)

Three female schizophrenic patients receiving a combination of psychotropic agents including the antiparkinsonian agent benztropine mesylate, developed the central anticholinergic syndrome, consisting of hallucinations, anxiety, short-term memory loss, disorientation, and agitation. These symptoms responded dramatically to physostigmine salicylate administered intramuscularly; they were unaffected by placebo injection given on a double-blind basis. In patients receiving multiple psychotropic drugs, evaluation of whether the patient is acting confused because of the combined central anticholinergic properties of these drugs is important. When identified, this syndrome can usually be treated by reduction of the dose of the anticholinergic agents or in special instances by the use of the cholinomimetic agent physostigmine.

FINK, M. Levomethadyl (LAAM): A long-acting substitute for methadone in maintenance therapy of opiate dependence. Current Psychiatric Therapies. Edited by J. H. Masserman. New York: Grune and Stratton, 1970.

FINK, M. Opiate dependence - Treatment and prophylaxis. Biochemical and Pharmacologic Aspects of Dependence and Reports on Marijuana Research. Edited by H. M. van Praag. Amsterdam, the Netherlands: Ervin F. Bohn, 1972. Pp. 85-99.

FINK, M. Questions in cyclazocine therapy of opiate dependence. Opiate Addiction: Origins and Treatment. Edited by S. Fisher and A. M. Freedman. Washington, D.C.: V. H. Winston and Sons, Inc., 1974.

FINK, M. A rational therapy of opiate dependence: Narcotic antagonists. Drug Abuse: Proceedings of the International Conference. Edited by C. J. D. Zarafonetis. Philadelphia, Pennsylvania: Lea and Febiger, 1971.

FINK, M. Technology in psychiatric research. Non-Scientific Constraints in Medical Research. Edited by S. Merlis. New York: Raven Press, 1970. Pp. 91-96.

FINK, M. Treatment and prevention of opiate dependence. Contemporary Drug Problems. Washington, D.C.: Federal Legal Publications, 1972.

FINK, M. and FREEDMAN, A. M. Antagonists in the treatment of opiate dependence. Modern Trends in Drug Dependence and Alcoholism. Edited by R. V. Phillipson. London: Butterworths, 1970. Pp. 49-59.

For abstract, see Section VI. Drug Use/Abuse Prevention.

FINK, M., FREEDMAN, A., RESNICK, R. and ZAKS, A. Clinical status of the narcotic antagonists in opiate dependence. Agonist and Antagonist Actions of Narcotic Analgesic Drugs. Edited by H. Kosterlitz, H. O. J. Collier and J. Villarreal. London, England: MacMillan, 1972. Pp. 266-276.

FINK, M., FREEDMAN, A. M., ZAKS, A. M. and RESNICK, R. B. Narcotic antagonists. Another approach to addiction therapy. American Journal of Nursing 71: 1359-1363 (1971)

Currently, the most popular approaches to the treatment of drug addiction are methadone programs and therapeutic communities. Narcotic antagonists, such as cyclazocine and naloxone, may, however, be the answer for the future.

FINK, M., ZAKS, A., RESNICK, R. B. and FREEDMAN, A. M. Narcotic antagonists in the treatment of opiate dependence. International Journal of Clinical Pharmacology, Therapy and Toxicology 4: 455-458 (1971)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

FINK, M., ZAKS, A., RESNICK, R. and FREEDMAN, A. Opiate antagonists in the treatment of heroin dependence in man. Narcotic Drugs, Biochemical Pharmacology. Edited by D. Clouet. New York: Plenum Press, 1971.

For abstract, see Section III. Mechanisms of Action of Different Drugs.

FINK, M., ZAKS, A., RESNICK, R. and FREEDMAN, A.M. Treatment of heroin dependence with opiate antagonists. Current Psychiatric Therapies. Edited by J. Masserman. New York: Grune and Stratton, 1970. Pp. 161-170.

FINK, M., ZAKS, A., SHAROFF, R., MORA, A., BRUNER, A., LEVIT, S. and FREEDMAN, A.M. Naloxone in heroin dependence. Clinical Pharmacology and Therapeutics 9: 568-577 (1968)

FINNEGAN, L.P., CONNAUGHTON, J.F. and EMICH, J.P. Abstinence score in the treatment of the infant of the drug-dependent mother. International Journal of Clinical Pharmacology and Therapeutic Toxicology 10(2): 139 (1974)

Over the past 3 years 85% of 146 infants of drug dependent mothers at Philadelphia General Hospital manifested symptoms of abstinence. In the management of the first 121 infants careful observation for the progression of symptoms preceded the use of drugs in the therapeutic regimen. Thus far the decision to use drugs or to increase dosage was influenced by arbitrarily applied clinical criteria providing inadequate basis for judgment in the treatment of this syndrome. A neonatal abstinence score has been devised to provide a more precise method of management in the last 25 infants of drug dependent mothers. 21 of the commonly seen symptoms are listed and each has been given a score of 1-5 according to its clinical significance. The infants are scored once every hour for the first 24 hours, every 2 hours for the second 24 hours and every 4 hours for the duration of the symptomatology. Infants whose scores are 7 or less are not treated with drugs. Once a score of 8 or more is attained and sustained for 3 hours the infant is treated. Dosage schedules relating the score to particular dosages of detoxicant drugs are used. This abstinence score will help in monitoring the symptomatology of the passively addicted infant and may provide more uniform criteria for assessment and treatment.

FINNEGAN, L.P., CONNAUGHTON, J.F. and SCHUT, J. Family center: A comprehensive program for pregnant drug-dependent women and their newborns. Pediatric Research (in press)

FINNEGAN, L. P., KRON, R. E., CONNAUGHTON, J. F. and EMICH, J. P. Neonatal abstinence syndrome: Assessment and management. International Journal of Addictive Diseases (in press)

A scoring system for the neonatal abstinence syndrome has been devised and implemented as both a clinical and investigative tool. The score monitors the passively addicted infant in a more comprehensive and objective fashion, and facilitates a more precise evaluation of the clinical status of the infant undergoing withdrawal. In addition, the scoring system has been applied in research designed to test the comparative usefulness of various pharmacologic agents currently recommended for the neonatal abstinence syndrome, and has been found useful in following the progression and diminution of withdrawal symptomatology before, during, and after therapy. Furthermore, the scoring system provides a basis for developing uniform criteria for the assessment and treatment of the neonate born to the addicted mother.

FINNEGAN, L. P., KRON, R. E., CONNAUGHTON, J. F. and EMICH, J. P. A scoring system for evaluation and treatment of the neonatal abstinence syndrome: A new clinical and research tool. Basic and Therapeutic Aspects of Perinatal Pharmacology New York: Raven Press (in press)

FINNEGAN, L. P. and MacNEW, B. A. Care of the addicted infant. American Journal of Nursing 74(4): 685-693 (April, 1974)

A comprehensive discussion of the problems that may beset the baby born to the narcotic-dependent mother, and recommendations for their solution.

FISHMAN, J., NORTON, B. and HAHN, E. Differential distribution of opiate agonists and antagonists in the rat brain as determined by double isotope techniques. Presented at the meeting of the American Society of Biological Chemists, 1974.

For abstract, see Section I. Methodology of Drug Research.

FISHMAN, J., ROFFWARG, H. and HELLMAN, L. Disposition of naloxone-7, 8-^{3}H in normal and narcotic-dependent men. The Journal of Pharmacology and Experimental Therapeutics 187(3): 575-580 (1973)

For abstract, see Section I. Methodology of Drug Research.

FREEDMAN, A. M. and FINK, M. Basic concepts and use of cyclazocine in the treatment of narcotic addiction. British Journal of the Addictions 63: 59-69 (1968)

Recent developments in the field of narcotic addiction have established the prerequisites for a rational approach to narcotic addiction. This does not imply that a definitive procedure has been established, however, a method that can lead to a variety of meaningful modalities relevant to the different types can be put into practice and evaluated. Since the structure of society itself contributes to the genesis and maintenance of addiction, the ultimate resolution may necessitate social changes. The strategy must be one in which a start is made along the lines that are feasible so that we may proceed systematically to treat and eventually to prevent the various types of addiction. Those types not amenable to current techniques will be managed by the development of new procedures.

FREEDMAN, A.M., FINK, M., SHAROFF, R. and ZAKS, A. Clinical studies of cyclazocine in the treatment of narcotic addiction. American Journal of Psychiatry 124(11): 1499-1504 (May, 1968)

Cyclazocine, a long-acting narcotic antagonist, was found to be safe and useful in the treatment of narcotic addicts in a voluntary municipal hospital. Treatment induction in 15 days to a daily maintenance dose of 4.0 mg. was well tolerated. That dosage effectively blocked clinical and EEG effects of challenges with 15 mg. of intravenous heroin, administered in two minutes, for periods greater than 24 hours. Cyclazocine treatment permits "engagement" and continuity of rehabilitation and resocialization efforts, and provides a useful alternative to the methadone maintenance treatment model.

FREEDMAN, A.M., ZAKS, A., RESNICK, R. and FINK, M. Blockade with methadone, cyclazocine, and naloxone. International Journal of the Addictions 5(3): 507-515 (September, 1970)

GASTON, E.T. and EAGLE, C.T., JR. The function of music in LSD therapy for alcoholic patients. Journal of Music Therapy 7: 3-19 (Spring, 1970)

The purpose of this study was to obtain quantitative data concerning the function of music in LSD therapy, the knowledge of which would make the use of music more effective in LSD treatment programs in general, and with alcoholic patients in particular. So far as is known, this was the first study incorporating controlled conditions to determine the influence of music on patients during LSD treatment.

GERLACH, J., KOPPELHUS, P., HELWEG, E. and MONRAD, A. Clozapine and haloperidol in a single blind cross-over trial. Treatment of schizophrenia, therapeutic and biochemical aspects. Acta Psychiatria Scandinavica (in press)

GESSNER, P.K. and CLARKE, C.C. The effects of meperidine and dextromethorphan on thermoregulation in mice. Temperature Regulation and Drug Action. Edited by E. Schonbaum and J. Jacob. New York: S. Karger, 1975,

GESSNER, P.K. and SOBLE, A.G. Studies on the role of brain 5-hydroxytryptamine in the interaction between tranylcypromine and meperidine. Federation Proceedings 29: 685 (1970)

For abstract, see Section VI. Drug Use/Abuse Prevention.

GOLDIAMOND, I. Heroin abuse: A constructional self control program. Presented at the 82nd Annual Convention of the American Psychological Association, New Orleans, Louisiana, September 1, 1974.

GOLDSTEIN, A. Are opiate tolerance and dependence reversible: Implications for the treatment of heroin addiction. Biological and Behavioral Approaches to Drug Dependence. Edited by H. Cappel and A.E. LeBlanc. Toronto, Ontario: Addiction Research Foundation, 1974.

GOLDSTEIN, A. Blind comparison of once-daily and twice-daily dosage schedules in a methadone program. Clinical Pharmacology and Therapeutics 13(1): 59-63 (January-February, 1972)

In a large methadone program, 120 patients were randomly assigned to two groups at the time of admission. One received the daily methadone dose in two equal portions, morning and evening. The other received the whole daily dose in the morning and a placebo in the evening. The experiment continued for 3 months. Results were evaluated periodically by a number of criteria such as symptom complaints, heroin use, and survivorship in the program. The results in the two groups did not differ at all except in a few respects, in which the advantage lay with the once-daily schedule. There is no reason, therefore, to administer methadone more than once daily.

GOLDSTEIN, A. Blind controlled dosage comparisons in two hundred patients. Proceedings of the Third National Conference on Methadone Treatment. Washington, D.C.: U.S. Government Printing Office, 1971. P. 31.

GOLDSTEIN, A. Blind dosage comparisons and other studies in a large methadone program. Journal of Psychedelic Drugs 4: 177 (1971)

GOLDSTEIN, A. Heroin addiction and the role of methadone in its treatment. International Journal of the Addictions 21: 3 (1974)

GOLDSTEIN, A. Heroin addiction and the role of methadone in its treatment. Archives of General Psychiatry 26: 291-297 (April, 1972)

Tolerance and physical dependence, although important in the addicted state, cannot account for the central problem of addiction--relapse from the abstinent state. Psychologic conditioning theory offers more satisfactory explanations. Methadone programs are effective, it is proposed, not because addicts have any "biochemical need" for opiates, but for straightforward pharmacologic and psychologic reasons. Methadone hydrochloride abolishes the periodic cross-tolerance, it diminishes the rewarding (reinforcing) effects of heroin. Thus methadone allows the motivated addict to discontinue heroin use without discomfort. A methadone program should strengthen that motivation by providing a nonpunitive environment within which self-help and peer help can operate to alter life style. A methadone temporary support program is outlined as an alternative to methadone maintenance of indefinite duration.

GOLDSTEIN, A. Status of drug research. Drug Abuse - Now: Proceedings of the Western Institute of Drug Problems Summer School. Edited by P. H. Blachly. Portland, Oregon: University of Oregon Medical School, 1971. P. 18.

GOLDSTEIN, A. and BROWN, B.W. Urine testing schedules in methadone maintenance treatment of heroin addiction. Journal of the American Medical Association 214: 311-315 (October, 1970)

In the treatment of heroin addiction by methadone hydrochloride maintenance, it is customary to test urine specimens regularly, in order to monitor each patient's illicit use of drugs and to assess the general success of the program. Principles and graphs are presented here to aid the physician in choosing an economical testing frequency, and in interpreting the results quantitatively on a correct statistical basis. For most purposes, a random testing schedule at an average frequency of once in five days will suffice.

GOLDSTEIN, A., HANSTEEN, R.W., HORNS, W.H. and RADO, M. Control of methadone dosage by patients. Proceedings of the First National Drug Abuse Conference, Chicago, Illinois, March 30-April 1, 1974 (in press)

GOLDSTEIN, A. and JUDSON, B.A. Efficacy and side effects of three widely different methadone doses. Proceedings of the Fifth National Conference on Methadone Treatment. New York: National Association for the Prevention of Addiction to Narcotics, 1973. P. 21.

GOLDSTEIN, J.W. Students' evaluations of their psychoactive drug use. Journal of Counseling Psychology (in press)

For abstract, see Section V. Adverse Effects, Toxicity and Genetic Effects.

GORODEZKY, M.J., DWARSHUIS, L., and KOLTON, M.S. Evaluation research with innovative drug programs. Drug Forum 3(4): 349 (Summer, 1974)

For abstract, see Section VI. Drug Use/Abuse Prevention.

GRAY, A.P. and ROBINSON, D.S. Insoluble salts and salt complexes of cyclazocine and naloxone. Narcotic Antagonists. Edited by M.C. Braude, L.S. Harris, E.L. May, J.P. Smith and J.E. Villarreal. Advances in Biochemical Psychopharmacology, Vol. 8. New York: Raven Press, 1973.

For abstract, see Section VI. Drug Use/Abuse Presention.

GRAY, A.P. and ROBINSON, D.S. Naltrexone zinc tannate: A prolonged-action narcotic antagonist complex. Journal of Pharmaceutical Sciences 63(1): 159-161 (January, 1974)

HAHN, E.F., FISHMAN, J. and HEILMAN, R.D. Narcotic antagonists IV. C-6 derivatives of substituted noroxymorphones as narcotic antagonists. Journal of Medicinal Chemistry (in press)

For abstract, see Section VI. Drug Use/Abuse Prevention.

HANLON, T.E., KURLAND, A.A. and McCABE, O.L. Naloxone treatment of the paroled narcotic addict: A program of research. Neurotherapy and Other Treatments, Vol. 5. Edited by J. Singh. Mount Kisco, New York: Futura Publishing Company, 1974.

For abstract, see Section VI. Drug Use/Abuse Prevention.

HANLON, T.E., McCABE, O.L. and KURLAND, A.A. Contingent naloxone treatment of the narcotic addict. American Journal of Drug Abuse and Alcoholism (in press)

HARINDRANATH, A., FEINGOLD, E., SOKAL, M., HARPER, R.G. and SOLISH, G. Cellular content of placentas of methadone-maintained addicts. Society for Pediatric Research (in press)

For abstract, see Section V. Adverse Effects, Toxicity and Genetic Effects.

HENDERSON, A., NEMES, G., GORDON, N.B. and ROOS, L. Sleep and narcotic tolerance. Psychophysiology 7(2): 346-347 (September, 1970)

HO, I.K., LOH, H.H. and WAY, E.L. Effects of cyclic 3', 5' - adenosine monophosphate on morphine tolerance and physical dependence. The Journal of Pharmacology and Experimental Therapeutics 185(2): 347-357 (1973)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

HOLLISTER, L.E., SHELTON, J. and KRIEGER, G. A controlled comparison of lysergic acid diethylamide (LSD) and dextroamphetamine in alcoholics. American Journal of Psychiatry 125: 1352-1357 (April, 1969)

Seventy-two alcoholic patients were admitted to a controlled comparison of LSD and dextroamphetamine as treatments. In the contest of little associated psychotherapeutic intervention, LSD produced slightly better results early, but after six months the results were alike for both treatment groups. Controlled studies of such treatments are not only possible but mandatory, the authors conclude, if one is not to be misled into ascribing special therapeutic attributes to a specific treatment.

HUGHES, P., CHAPPEL, J., SENAY, E. and JAFFE, J. Developing inpatient services for community-based treatment of narcotic addiction. Archives of General Psychiatry 25(3): 278-283 (September, 1971)

A specialized inpatient unit for the treatment of addiction was developed in a general hospital. Architectural considerations were important in the planning of the unit to assure control over outpatient traffic to and from the unit. The tendency of hospitalized narcotic addicts to form an antitherapeutic patient subculture was reduced by developing a special staffing pattern in which ex-addicts were given equal responsibility with nurses for operation of the unit.

HUGHES, P.H., CRAWFORD, G.A. and BARKER, N.W. Developing an epidemiologic field team for drug dependence. Archives of General Psychiatry 24(5): 389-393 (May, 1971)

We are concerned with the question of how local treatment programs for narcotic addiction might organize their therapeutic activities around the goal of reducing incidence and prevalence of this disorder in defined communities. Toward this end, they examined program models developed for control of infectious diseases such as syphilis. A key element in the venereal disease control system is the epidemiologic field team which engages in intensive case-finding and treatment-intake functions, and which responds quickly to contain local epidemics. We explored the feasibility of using methadone-maintained ex-addict field workers to perform similar functions in an addiction control system. Despite a number of developmental problems, this field team was able to carry out a variety of epidemiologic-research, case-finding, and intervention functions on the actively addicted population of their community.

HUGHES, P.H., CRAWFORD, G.A., BARKER, N.W., SCHUMANN, S. and JAFFE, J.H. The social structure of a heroin copping community. American Journal of Psychiatry 128(5): 551-557 (November, 1971)

A field worker was assigned to a heroin distribution site or "copping area" in a Chicago neighborhood for a period of one year. He identified and monitored 127 different dealers and consumers who were regular visitors to the site. Thirty-four of these addicts were involved in a home visit and outreach treatment project. These sources of data permitted the authors to describe the role structure of a local heroin maintenance system, the distribution of its membership in various roles, and the social and treatability characteristics of the occupants of these roles. Their findings suggest that neighborhood heroin distribution systems are amenable to study and manipulation by treatment programs.

HUGHES, P.H. and JAFFE, J.H. The heroin copping area. A location for epidemiological study and intervention activity. Archives of General Psychiatry 24(5): 394-400 (May, 1971)

Before we could carry out systematic studies and intervention projects on the active heroin addict population of our community, we were in need of a field concept that would define addicts as members of a social system rather than as individual social units. Early observations suggested that most heroin users in an urban community are already members of a natural group structure, i.e., they participate daily in the operations of a neighborhood heroin-distribution system. To explore the possibility of organizing epidemiologic activities around this drug-distribution system, a field team was assigned to the intense study of one such copping area. The team observed and gathered information from all addicts who regularly obtained or distributed heroin at this site for a period of six months. This experience suggests that it is possible to obtain epidemiologic data on addicts who frequent a copping area, and that it might be possible to study the impact of treatment, law enforcement, and other competing social factors on the prevalence of active heroin use at such sites.

JAFFE, J., DAHLBERG, C.C., LURIA, J., BRESKIN, S., CHOROSH, J. and LORICK, E. Speech rhythms in patient monologues: The influence of LSD-25 and dextroamphetamine. Biological Psychiatry 4(3): 243-246 (1972)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

JAMES, J. Female addictive research. Addictive Diseases: An International Journal (in press)

JANSEN, D.R., BROWN, B.S. and BASS, U.F., III. Attitudes and beliefs of clients toward methadone prior to and during treatment. Presented at the 5th National Conference on Methadone Treatment, Washington, D.C., March 17, 1973.

JANSEN, D.R., BROWN, B.S. and BASS, U.F., III. Comparison of attitudes and beliefs about methadone of clients retained and lost to treatment. Drug Forum 3(3): 215-223 (Spring, 1974)

Forty clients retained in treatment one month, and 69 not retained were administered open-ended interviews and semantic differentials tapping attitudes regarding heroin and methadone. Attitude toward heroin was found an effective predictor of retention in treatment beyond one month. Retained clients became more favorable toward methadone in that first treatment month, but limited the length of time they planned to remain on methadone. Moreover, time actually spent on methadone correlated with length of time expected to remain on methadone.

JOE, G.W. Retention in treatment of drug users in the DARP: 1969-1971 admissions. Evaluation of Treatments. Edited by S.B. Sells. Studies of the Effectiveness of Treatments for Drug Abuse, Vol. 1. Combridge, Massachusetts: Ballinger, 1974.

JOE, G.W., PERSON, P., JR., SELLS, S.B. and RETKA, R.L. An evaluative study of methadone and drug free therapies for opiate addiction. Evaluation of Treatments. Edited by S.B. Sells. Studies of the Effectiveness of Treatments for Drug Abuse, Vol. 1. Cambridge, Massachusetts: Ballinger, 1974.

KHAZAN, N. and ROEHRS, T. Methadone dependence and abstinence: EEG study in the rat. Drug Addiction: Neurobiology and Influences on Behavior, Vol. III. Edited by J.M. Singh and H. Lal. New York: Stratton Intercontinental Medical Book Company, 1974.

For abstract, see Section III. Mechanisms of Action of Different Drugs.

KHAZAN, N. and ROEHRS, T. Methadone versus morphine - EEG and sleep-awake cycle during dependence and abstinence. Clinical Toxicology 7: 294 (1974)

KOLTON, M. The humanistic treatment philosophy of innovative drug programs. Journal of Humanistic Psychology 13(4): 47-56 (Fall, 1973)

KOLTON, M.S., DOSHER, A. and DWARSHUIS, L. Community drug-abuse programs for youth: A conceptual model. International Journal of the Addictions 7(2): 333-339 (1972)

KOLTON, M. and DWARSHUIS, L. Evaluation of innovative drug programs. Journal of Alternative Human Services 1(4): 46-53 (1974)

KOLTON, M., DWARSHUIS, L. and GORODEZKY, M. Innovative Michigan drug programs. Michigan Academician 5(1) (Summer, 1972)

KURLAND, A.A. The deceptive communication and the narcotic abuser. Rutgers Symposium on Communication and Drug Abuse, New Brunswick, New Jersey, September 3-5, 1969.

KURLAND, A.A. Outpatient management of the narcotic addict. Drugs and the Brain. Edited by P. Black. Baltimore, Maryland: The Johns Hopkins Press, 1969. Pp. 363-370.

KURLAND, A.A., BASS, G.A., KERMAN, F. and KOKOSKI, R. The out-patient management of the paroled narcotic abuser -- a four-year evaluation. Committee on Problems of Drug Dependence. Washington, D.C.: National Academy of Sciences, National Research Council, 1969.

KURLAND, A.A., HANLON, T.E. and McCABE, O.L. Naloxone and the narcotic abuser: A controlled study of partial blockade. International Journal of the Addictions 9(5): 663-672 (1974)

For abstract, see Section VI. Drug Use/Abuse Prevention.

KURLAND, A.A., McCABE, L. and HANLON, T. Contingent naloxone treatment of the narcotic addict: A pilot study. International Journal of the Addictions 2(1) (in press)

For abstract, see Section VI. Drug Use/Abuse Prevention.

LEVINE, R., ZAKS, A., FINK, M. and FREEDMAN, A.M. Levomethadyl acetate: Prolonged duration of opioid effects, including cross-tolerance to heroin in man. Journal of the American Medical Association 226(3): 316 (October, 1973)

For abstract see Section III. Mechanisms of Action of Different Drugs.

LEVY, S.J. and EUKER, C. Post Treatment Occupational and Educational Services for the Former Drug Abuser in New York City. A Model for an Occupational and Educational Information Referral Service and an Employment Service. Albany, New York: Bureau of Occupational Education Research, State Education Department, 1973.

This project was prompted by information culled from the New York State Drug Administrators' Conference and the New York State Crisis Center Conference concerning the occupational and educational needs of former drug abusers in New York State and New York City. Data collected as a result of these conferences indicated the need for further study. Information was needed in the practices of drug abuse treatment programs and occupational and educational agencies as they relate to the post treatment education and employment of the former drug abuser.

The first part of this report consists of a review of the initiation of the project and the research procedures employed. The second part is an overview of the drug abuse treatment programs including the development of clients skills for education and the job market. Employment practices of business and industry and the interface between treatment and employment are also reviewed. The conclusions drawn from this review set the stage for the development of the proposed models.

The third section describes two models. The first is a model for an occupational and educational information referral service for ex-drug abusers in New York City. The second model is for an employment service for the same target population. The delivery system for the two models is an independent non-profit agency. This agency would be designed to serve as an intermediary service organization between the treatment programs and educational and occupational institutions. Special attention is devoted to the distinction between specific skills preparation and attitudinal and psychological preparation for schooling and employment. The special problems of methadone maintenance patients are also noted.

The final section is a presentation of a computer system for the proposed models and the combined model budget projections. A summary is included at the end of the report which contains recommendations for potential implementation and funding of the models.

LUDWIG, A.M. A model for evaluating the clinical and therapeutic effects of psychedelic agents. Psychopharmacology: A Review of Progress, 1957-1967. Edited by D. Efron, J. Cole, J. Levine and J.R. Wittenborn. Washington, D.C.: U.S. Government Printing Office, 1968. Pp. 1263-1268.

LUDWIG, A.M. The relationship of attitude to behavior. Preliminary results and implications for treatment evaluation studies. Research Psychotherapy, Vol. 3. Edited by J.M. Shlein, H.F. Hunt, J.D. Matarazzo and C. Savage. Washington, D.C.: American Psychological Association, 1968. Pp. 471-487.

LUDWIG, A.M. Studies on alcoholism and LSD: Influence of therapist attitudes on treatment outcome. American Journal of Othropsychiatry 38: 733-737 (1968)

LUDWIG, A. M. and LEVINE, J. Hypnodelic therapy. Current Psychiatric Therapies. Edited by J. H. Masserman. New York: Grune and Stratton, Inc., 1970. Pp. 130-141.

In conclusion, we should like to state that our investigations with the hypnodelic technique leave little question in our minds that a single profound experience can produce dramatic symptom relief and constructive attitude change in many patients. However, it will take much further research to determine how lasting these changes are, the relationship of this change to actual behavioral change, the spectrum of patients most suitable for this treatment, and the efficacy of this procedure compared to other forms of psychedelic and psychiatric therapy.

LUDWIG, A., LEVINE, J., STARK, L. and LAZAR, R. A clinical study of LSD treatment in alcoholism. American Journal of Psychiatry 126: 59-69 (1969)

One hundred seventy-six male alcoholic patients participated in a controlled investigation of the differential efficacy of three LSD treatment procedures and a "no therapy," or milieu treatment, condition. Half of each group was also assigned to disulfiram after discharge from the hospital to determine whether any of these techniques could be enhanced by its use. Although significant improvement was shown within all treatment groups as measured by a number of clinical assessments in the post-treatment and follow-up periods, no one treatment condition proved to be superior. The authors conclude that the dramatic claims for the efficacy of LSD treatment in alcoholism are unjustified.

McAULIFFE, W. E. and GORDON, R. A. A test of Lindesmith's theory of addiction. The frequency of euphoria among long-term addicts. American Journal of Sociology 79(4): 795-840 (January, 1974)

For abstract, see Section I. Methodology of Drug Research.

McCABE, C. L., HANLON, T., SAVAGE, C., SCHOCK, H., KURLAND, A. and BOGAN, P. Contingent naloxone treatment of the narcotic abuser: Studies of two patient samples. Proceedings of the 5th International Institute on the Prevention and Treatment of Drug Dependence. Lausanne, Switzerland: International Council on Alcohol and Addictions (in press)

McCABE, O. L., KURLAND, A. A. and SULLIVAN, D. Paroled narcotic addicts in a verified abstinence program: Results of a five year study. International Journal of the Addictions (in press)

McCABE, O. L., KURLAND, A. A. and SULLIVAN, D. A study of methadone failures in an abstinence program. International Journal of the Addictions (in press)

MADDUX, J. F., BERLINER, A. K. and BATES, W. M. Engaging Opioid Addicts in a Continuum of Services. A Community-Based Study in the San Antonio Area. Fort Worth, Texas: Texas Christian University Press, 1971.

MATEFY, R.E. Behavior therapy to extinguish spontaneous recurrences of LSD effects: A case study. Journal of Nervous and Mental Disease 156(4): 226-231 (1973)

Systematic desensitization in conjunction with other behavior techniques was utilized to treat a client who for 5 months was experiencing spontaneous recurrences of LSD effects. Besides the elimination of the target symptoms (flashback effects), additional desired changes occurred on both cognitive-affective and behavioral levels. A theoretical explanation of LSD flashback effects based on the role-enactment model is presented.

MAYO, G.A., CALLAHAN, D. and CALLAHAN, B. The Family. A Self Help Program for Drug Abusers. Pueblo, Colorado: Colorado State Hospital, 1974.

MUNKVAD, I., HEIN, G. and HERSKIN, B. The treatment of chronic schizophrenics with pimozide (Orap). Clinical Trials Journal 8 (Supplement II): 67-71 (1971)

A trial of pimozide (Orap) on 16 chronic male schizophrenics is described. In these cases previous neuroleptic treatment had been given without special benefit. The main symptoms such as paranoid ideas, hallucinations, emotional withdrawal and repetitive stereotyped movements were still dominating the patients, even though in some they may have been slightly modified.

Pimozide dosage, given to most of the cases for six weeks, started at 6 mg daily, was increased to a maximum average of 15 mg, and was reduced to an average daily dosage of 12 mg. Psychological testing was carried out before, during and after pimozide therapy.

Six patients showed marked improvement, nine were unchanged, and one became worse. These results were confirmed statistically. In the six improved patients, the effect of pimozide on dominating symptoms was two to three times better than the effects on general schizophrenic symptoms. Perseverance and compulsive stereotyped movements were among the seven symptoms most successfully influenced by the drug.

Side-effects were rare; slight akathisia being reported in only two cases.

The interference with striatal dopamine by neuroleptic drugs is discussed and the importance of antidopaminergic activity, a property of pimozide, in influencing compulsive stereotyped movements is put forward.

OVERALL, J.E., HOLLISTER, L.E. and POKORNY, A.D. Alcohol history in drug treatment. Diseases of the Nervous System 34: 175-180 (April-May, 1973)

PHOENIX, D.D., JR., KALUZNY, A.D., VENEY, J.E., ZALKIND, D. and FERGUSON, L. Some approaches to providing innovative drug abuse treatment services. Presented at the National Drug Abuse Conference, Chicago, Illinois, March 30-April 1, 1974.

The purpose of this paper is to outline a series of research questions on the implementation of drug abuse treatment programs and the process of change within the programs themselves. In so doing, we focus on the providers of drug abuse treatment services rather than the drug abuser. We attempt to hypothesize: (1) why certain types of treatment programs are implemented; (2) the speed with which they are implemented given the availability of resources; (3) factors associated with the adoption of innovative drug treatment modalities by service providers. Finally, we suggest a method by which drug programs can be made more responsive to changing community needs and demands.

RANDRUP, A. and MUNKVAD, I. Evidence indicating an association between schizophrenia and dopaminergic hyperactivity in the brain. Orthomolecular Psychiatry 1: 2-7 (1972)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

REGELSON, W., BUTLER, J.R., SCHULTZ, J., KIRK, T., PEEK, L. and GREEN, M.L. Delta-9-tetrahydrocannabinol (Delta-9-THC) as an effective antidepressant and appetite stimulating agent in advanced cancer patients. Presented at the International Conference on the Pharmacology of Cannabis, National Institute on Drug Abuse, December 3-6, 1974.

RESNICK, R.B., FINK, M. and FREEDMAN, A.M. Cyclazocine treatment of opiate dependence: A progress report. Comprehensive Psychiatry 12(6): 491-502 (November, 1971)

RESNICK, R.B., FINK, M. and FREEDMAN, A.M. A cyclazocine typology in opiate dependence. American Journal of Psychiatry 126: 1256-1260 (1970)

The authors present a typological classification useful in the therapy of opiate dependence based on the patients' self-ratings of their need for opiates. Fourteen male subjects on cyclazocine treatment for up to two and one-half years reported less dependence on opiates for normal functioning than 17 male subjects who discontinued treatment. The existence of a consistent heterosexual relationship was significant in successful cyclazocine treatment. Enlisting patients' wives to supervise the daily cyclazocine intake has proven useful.

RESNICK, R., FINK, M. and FREEDMAN, A.M. High dose cyclazocine therapy of opiate dependence. American Journal of Psychiatry 131: 595-597 (May, 1974)

Twenty-three former heroin addicts who had been stabilized on 4 to 5 mg. of cyclazocine per day had their dosage increased to 10 to 30 mg. per day. These increases resulted in mild, transient side effects. The narcotic-blocking activity of cyclazocine was extended to 48 hours by a daily dose of 10 mg. and to 72 hours by 20 mg. A daily dose of 30 mg. increased its blocking activity at 48 hours but not at 72 hours.

RICHTER, R.W., PEARSON, J., BRUUN, B., CHALLENOR, Y.B., BRUST, J.C.M. and BADEN, M.M. Neurological complications of addiction to heroin. Bulletin of the New York Academy of Medicine 49(1): 3-21 (January, 1973)

For abstract, see Section V. Adverse Effects, Toxicity and Genetic Effects.

SCHIØRRING, E. Can we change the behavior and attitude of adolescents to ingestion of euphoriant drugs? Folkeskolen 36 and 37 (1971)

SCHOOFF, K.G., HERSCH, R.G. and KEEGAN, J.F. Narcotic antagonists: A reasonable method of treating narcotic dependency. International Journal of the Addictions (in press)

SCHOOFF, K.G., HERSCH, R.G. and LOWY, D.G. Cyclazocine -- a reasonable alternative to methadone. Committee on Problems of Drug Dependence. Washington, D.C.: D.C.: National Academy of Sciences, National Research Council, 1973.

SCHOOFF, K.G., KEEGAN, J.F. and LOWY, D.G. Cyclazocine. A prerequisite in the treatment of heroin addiction. Committee on Problems of Drug Dependence. Washington, D.C.: National Academy of Sciences, National Research Council, 1974.

SCHOOLAR, J.C., WHITE, E.H. and COHEN, C.P. Drug abusers and their clinic-patient counterparts: A comparison of personality dimensions. Journal of Consulting and Clinical Psychology 39(1): 9-14 (1972)

This study compares interpersonal behavior patterns of drug abuse patients with their non-drug-using counterparts. The Interpersonal System developed in 1956 by T. Leary was used in comparing eighty multi-drug-habituated patients at the Texas Research Institute's Drug Abuse Clinic with a population of outpatients matched for age and sex. The drug abusers emerged as significantly more hostile and critical, idealizing the socially undesirable behaviors of distrust and non-conformity and revealing a significant degree of self-deception. Self-perceptions of the two groups were similar and reflected a lack of confidence in their own ability to achieve success, but their reactions to these feelings were markedly different. Both groups perceived their parents as strong, self-reliant, and behaving in a socially desirable manner, although mothers of drug abusers were described as lacking warmth and nurturant behaviors.

SCHOOLAR, J.C., WINBURN, G.M. and HAYS, J.R. Rehabilitation of drug abusers -- a continuing enigma. Rehabilitation Literature 34(11): 327-330 (November, 1973)

SELLS, S.B. Evaluation of treatment for drug abuse -- A discussion of research problems and approaches from the perspective of the DARP. Report to the Joint NIMH-TCU drug abuse reporting program. The Effectiveness of Drug Abuse Treatment. Edited by S.B. Sells. Evaluation of Treatments, Vol. 1. IBR Report 73-14, 1973. Pp. 3-9.

SELLS, S.B. Research on Evaluation of Treatments for Drug Abuse Based on the NIMH-TCU Drug Abuse Reporting Program. Forth Worth, Texas: Texas Christian University, Institute of Behavioral Research, 1973.

SILVERMAN, I., BROTMAN, R., SUFFET, F. and ORDES, D. Reaching for accountability in community practice. Public Health Reports, Public Health Service, U.S. Department of Health Education and Welfare. 85(3): 251-260 (March, 1970)

SIMEON, J., KESKINER, A., FINK, M. and ITIL, T.M. Depot fluphenazine facilitation of treatment of psychosis. Changing Patterns in Psychiatric Care. Edited by T. Rothman. New York: Crown, 1970.

This chapter concerning the intramuscular use of fluphenazine decanoate at monthly and bimonthly intervals is one of timely importance. A well-designed scientific exploration of depot fluphenazine, this study shows its psychopharmacologic effectiveness as a phenothiazine and demonstrates the specific items of schizophrenia it helps to relieve. The study findings offer an optimistic probability that this drug will bring widespread relief to a multitude of patients not usually capable of following their aftercare treatment. Its practical advantage for use in community care will help to implement programs at present considered impractical and will facilitate a broader use in home care. This well-planned investigation deserves consideration for a more widespread application and replication.

SIMPSON, D.D. Use of alcohol by DARP patients in treatment for drug abuse: 1969-1971 admissions. Research on Patients, Treatments, and Outcomes. Edited by S.B. Sells. Studies of the Effectiveness of Treatments for Drug Abuse, Vol. 2. Cambridge, Massachusetts: Ballinger, 1974.

SIMPSON, D.D. and McRAE, D.J. Readmissions to treatment of drug users in the DARP: 1969-1971 admissions. Evaluation of Treatments. Edited by S.B. Sells. Studies of the Effectiveness of Treatments for Drug Abuse, Vol. 1. Cambridge, Massachusetts: Ballinger, 1974.

SMITH, S.G. and DAVIS, W.M. Behavioral control by stimuli associated with acquisition of morphine self-administration. Behavioral Biology 9(6): 777-780 (December, 1973)

For abstract, see Section IV. Behavioral Studies.

SMITH, S.G. and DAVIS, W.M. Interrelationships of exteroceptive and interoceptive stimuli associated with morphine self-administration: Significance to elimination of drug-seeking behavior. Clinical Toxicology 7: 264-265 (1974)

For abstract, see Section IV. Behavioral Studies.

SMITH, S.G. and DAVIS, W.M. Punishment of amphetamine and morphine self-administration behavior. The Psychological Record 24: 477-480 (1974)

For abstract, see Section IV. Behavioral Studies.

SOSKIN, W., Children of the Good Life. A Second Interim Report on Project Community, Berkeley, California, March, 1972.

SOSKIN, W.F., ROSS, N.W. and KORCHIN, S.J. The origins of Project Community: Innovating a social institution for adolescents. Seminars in Psychiatry 3(2): 271-287 (May, 1971)

This paper has explored some of the problems and issues that arose in the process of creating a new institution of socialization for adolescents, Project Community. These problems and issues have been conceptualized in terms of intra- and inter-institutional value conflicts and have been presented in the light of their importance and relevance to the more general issues of innovation in the mental health and related fields.

SOULE, A.B., STANDLEY, K., COPANS, S.A. and DAVIS, M. Clinical uses of the Brazelton neonatal scale. Pediatrics 54(5): 583-586 (November, 1974)

For abstract, see Section IV. Behavioral Studies.

SPIEGEL, D.K. and SELLS, S.B. Evaluation of treatments for drug users in the DARP: 1969-1971 admissions. Evaluation of Treatments. Edited by S.B. Sells. Studies of the Effectiveness of Treatments for Drug Abuse, Vol. 1. Cambridge, Massachusetts: Ballinger, 1974.

STRAUSS, M.E., ANDRESKO, M., STRYKER, J.C., WARDELL, J.N. and DUNKEL, L.D. Methadone maintenance during pregnancy: Pregnancy, birth and neonate characteristics. American Journal of Obstetrics and Gynecology 120: 895-900 (1974)

The records of 72 pregnant methadone addicts and 72 nonaddicted gravidas, all receiving prenatal care, were examined to determine the degree of obstetric risk associated with low dose methadone maintenance and dimensions of difference between addicted and nonaddicted newborn infants. Rates of pregnancy illness, pregnancy complications, as well as labor and delivery characteristics, did not differ between groups. Low birth weight (less than or equal to 2,500 grams) was not more common among addicted infants, although neonatal weight loss was greater in this group. Most addicted newborns were symptomatic, but pharmacologic treatment was required in only 30 per cent of the cases. Low-dose methadone maintenance in conjunction with comprehensive prenatal care appears to reduce obstetric risk to a level comparable with that of nonaddicted women of similar sociomedical circumstances.

Student Association for the Study of Hallucinogens, Inc. Different strokes for different folks. The multimodality approach to the management of narcotics addiction. A STASH literature review. Grassroots (November, 1973 Supplement)

Student Association for the Study of Hallucinogens, Inc. Methadone and pregnancy: An annotated guide to the literature. Journal of Psychedelic Drugs 6(1): 101-124 (January-March, 1974)

Student Association for the Study of Hallucinogens, Inc. STASH fact sheet on the British narcotic system. Grassroots (October, 1972 Supplement)

Student Association for the Study of Hallucinogens, Inc. STASH fact sheet on methadone. Grassroots (May, 1972 Supplement)

Student Association for the Study of Hallucinogens, Inc. STASH notes: Women and drugs. STASH Capsules 6(4) (August, 1974)

TAYLOR, W.J., CHAMBERS, C.D. and DEMBO, R. Cocaine abuse among methadone maintenance patients. Drug Abuse: Current Concepts and Research. Edited by W. Keup. Springfield, Illinois: Charles C. Thomas, 1972. Pp. 313-327

A study of methadone maintenance patients at the Philadelphia General Hospital revealed a rather high incidence of cocaine abuse (18.5 percent). The highest incidence of this form of abuse was among the black male patients over age 35 who had been heroin addicts for more than 10 years. These cocaine cheaters were also abusing drugs other than cocaine and had continued to engage in illegal activities even though they no longer could rationalize this behavior on the basis of their addiction. The necessity of having an adequate surveillance procedure to detect the abuse of cocaine as well as the abuse of sedatives, amphetamines, and opiates thus seems clear. The procedure for the detection of abuse-potential drugs in urine used in the clinical pharmacology-toxicology center of Philadelphia General Hospital is given in an appendix.

The University of the State of New York. Statewide Crisis Center Conference. Albany, New York: The State Education Department, Bureau of Occupational Education Research, 1973.

VERESS, F., MAJOR, V., FINK, M. and FREEDMAN, A. High dose tybamate therapy of heroin dependence. Journal of Clinical Pharmacology and New Drugs 9: 232-238 (1969)

VOSS, E.W., JR., and BERGER, B.B. Neutralization of LSD by active immunization. Psychopharmacologia 26: 140-145 (1972)

Mice immunized with a lysergic acid derivatized protein showed subsequent resistance to the effects of intravenously administered LSD as measured by the poke and rearing tests. Mice immunized with a tryptophyl conjugated protein displayed similar refractoriness relative to normal control mice. Thus, significant immunological cross reactivity as expressed by neutralization, was evident due to the common indole moiety of the two haptenic groups studied.

WATSON, D. and SELLS, S.B. Directory of Narcotic Addiction Treatment Agencies in the United States 1968-1969. Washington, D.C.: U.S. Government Printing Office, 1970.

WEBSTER, J.B., COUPAL, J.J. and CUSHMAN, P. Increased serum thyroxine levels in euthyroid narcotic addicts. Journal of Clinical Endocrinology and Metabolism 37(6): 928-934 (December, 1973)

For abstract, see Section V. Adverse Effects, Toxicity and Genetic Effects.

WELLISCH, D. and HAYS, J.R. Development of family therapy as a new treatment modality in a drug abuse program for adolescents. Current Issues in Adolescent Psychiatry. Edited by J.C. Schoolar. New York: Brunner/Mazel, Inc., 1973. Pp. 221-232.

This paper will describe an initial exploratory effort to enable the staff to consider the family, not only the individual, when viewing adolescent and post-adolescent drug problems as they are presented for treatment. The material will be presented in three sections: first, the general design of the drug treatment program and the treatment populations; next, the design of a pilot program, including clinical material from this effort and the trends observed as a result of it; third, staff issues encountered in the development of a family-conscious approach.

WHITE, E.H., COHEN, C.P. and SCHOOLAR, J.C. Families -- how can we help? St. Joseph Hospital Medical Surgical Journal 6(1): 43-51 (Spring, 1971)

WHITE, R.P., DREW, G.W. and FINK, M. Neuropharmacological analysis of agonistic actions of cyclazocine in rabbits. Biological Psychiatry 1: 217-330 (1971)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

WINBURN, G.M. and HAYS, J.R. Methadone: The carrot at the end of the stick. Drug Addiction: New Aspects of Analytical and Clinical Toxicology, Vol. 4. Edited by J.M. Singh and H. Lal. Mount Kisco, New York: Futura Publishing Company, Inc., 1973.

This study supports other studies which have reported increased legitimate employment, reduced criminal activity, reduced illicit drug use and improved physical health of addicted individuals who have been in methadone treatment for six months. This investigation made an exploratory attempt to examine the effectiveness of a methadone treatment system which uses concomitant therapy. Those addicts engaged in some type of therapy while receiving methadone showed less illicit drug use than those addicts receiving only medication. No significant differences were noted for employment and criminal activity between the two groups.

WINBURN, G.M. and HAYS, J.R. Methadone: One step toward rehabilitation. St. Joseph Hospital Medical Surgical Journal 9(1): 25-31 (March, 1974)

This study explores several issues concerning methadone treatment of the opiate-dependent individual. Using data gathered in an evaluation of the methadone program of the Texas Research Institute of Mental Sciences, the study examines whether or not therapy heightens the effectiveness of methadone treatment, using as criteria for success reduced criminal activity, increased employment, reduced illicit drug use, and improved health. Our findings generally support those of other studies that have reported improvement in these parameters among addicted individuals who have been in methadone treatment for six months.

Of greater interest and importance is a comparison of the effectiveness of methadone treatment used concurrently with therapy and the administration of methadone alone. Addicts engaged in therapy while receiving methadone showed less illicit drug use than did those receiving only medication. No significant differences between the two groups were noted for employment or criminal activity.

It is not possible to draw general conclusions for all methadone programs; further research is needed with larger samples and control groups over a longer period of time in order to explore the possible effects therapy has on the methadone client. But it is now reasonable to say that methadone is the most significant factor in keeping the addict in the treatment program. Since he is physically dependent on the medication, this dependence should be used to therapeutic advantage in order to deal successfully with his social, vocational, and interpersonal problems.

ZAKS, A., FINK, M. and FREEDMAN, A. Duration of methadone induced cross-tolerance to heroin. British Journal of the Addictions 66: 205-208 (1971)

ZAKS, A., FINK, M. and FREEDMAN, A.M. Levomethadyl in maintenance treatment of opiate dependence. Journal of the American Medical Association 220(6): 811 (May, 1972)

ZAKS, A., JONES, T., FINK, M. and FREEDMAN, A.M. Naloxone treatment of opiate dependence. Journal of the American Medical Association 215(13): 2108 (March, 1971)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

VIII

Psychosocial Studies

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VIII. Psychosocial Studies

AARONSON, B.S. LSD: Experimental findings. International Journal of Parapsychology 9(2): 86-90 (1967)

The psychedelic experience makes legitimate scientific investigation almost impossible. The nature of the LSD experience has been listed in 7 major categories by Marsh: (1) release of the symbolizing function, (2) experience of unity, (3) seeing through our cultural limits, (4) receptivity, (5) awareness of the shadow, of the not-self, (6) discovery of love, and (7) discovery of the true self. However, no 2 experiences, even for the same person, are alike. Masters and Houston divide the drug session into 4 stages: (1) sensory, (2) recollective-analytic, (3) symbolic, and (4) integrative. More research is needed in the methods of thinking produced by psychedelic drugs.

ABRAMS, R., FINK, M., DORNBUSH, R. L., FELDSTEIN, S., VOLAVKA, J. and ROUBICEK, J. Unilateral and bilateral ECT: Effects on depression, memory and the electroencephalogram. Archives of General Psychiatry 27: 88-94 (1972)

The relationship among the clinical, electroencephalographic (EEG) and memory changes occurring with unilateral electroconvulsive therapy (ECT) in 85 hospitalized depressed patients was investigated. Treatments were given by the patients' attending psychiatrists, who chose the method of treatment, its rate of administration, and prescribed concurrent psychotropic drugs according to his customary practice. Assessment of treatment outcome was not blind. Despite nonrandom assignment, the groups were equivalent prior to treatment for the variables relevant to outcome. In analysis of the data, differences between treatment groups were accounted for by multiple stepwise regression. The two methods of treatment differed for each parameter studied, with unilateral ECT yielding less therapeutic effect, less memory alteration, and different patterns of EEG change.

BABST, D. V., CHAMBERS, C. D. and WARNER, A. Patient characteristics associated with retention in a methadone maintenance program. British Journal of Addiction 66: 195-204 (1971)

For abstract, see Section VII. Treatment - Related Research.

BADEN, M. E. Drug abuse--its current status. New York Medicine 24: 464-474 (1968)

A discussion of the medical aspects of drug abuse is presented. In New York City, heroin addiction is the leading cause of death in the 15 to 35 year age group, and the number of addiction deaths are increasing. The medical complications of parenteral heroin and the causes of addiction death, as well as some of the characteristics of drug addicts are indicated. Physicians are becoming more involved with this problem, and they can make an invaluable contribution by helping treat the drug addict.

BADEN, M. M. Alcoholism as related to drug addiction: A medical examiner's view. Drug Abuse: Current Concepts and Research. Edited by W. Keup. Springfield, Illinois: Charles C. Thomas, 1972.

Present problems of heroin addiction and drug abuse are the result of past unwillingness and inability of society, the medical profession, and psychiatry to deal with other mental health problems, particularly, alcoholism and suicide. Postmortem findings and premortem histories indicate that it is naive to consider each type of drug abuse as unique, requiring a single specific solution: one antidote for the heroin addict, another for the alcoholic, etc. The medical profession in general and psychiatry in particular must begin to deal with the broad and common reasons for substance abuse, self-destructive behavior, and the inability to function productively in an increasingly complex society.

BALL, J. C. and CHAMBERS, C. D., editors. The Epidemiology of Opiate Addiction in the United States. Springfield, Illinois: Charles C. Thomas, 1970.

For abstract, see Section VI. Drug Use/Abuse Prevention.

BALL, J. C., CHAMBERS, C. D. and BALL, M. J. The association of marihuana smoking with opiate addiction. The Epidemiology of Opiate Addiction in the United States. Edited by J. C. Ball and C. D. Chambers. Springfield, Illinois: Charles C. Thomas, 1970.

The association of marihuana smoking and opiate use was investigated. It is indicated that several patterns of behavior may lead to drug addiction. Marihuana use is closely associated with opiate addiction in the high drug use metropolitan areas of the East and West but not associated with opiate addiction in 12 southern states.

BALL, J. C., CHAMBERS, C. D. and BALL, M. J. The association of marihuana smoking with opiate addiction in the United States. Journal of Criminal Law, Criminology and Police Science 59(2): 171-182 (1968)

The precise research question under investigation is: Given existing social conditions and laws, is the smoking of marihuana in the United States associated with the subsequent use of opiate drugs? If so, under what conditions; if not, under what conditions? The subjects were 2,213 addict patients admitted to the Lexington and Fort Worth hospitals during 1965. They included both voluntary admissions and Federal prisoners, males and females, Negroes and Whites, laborers and housewives, prostitutes and physicians, lawyers and forgers, and drug sellers as well as users. Forty-six of the fifty states were represented, and the range in age was from 16 to 75 years. It was found that there is a positive association between marihuana and opiate use in 16 states, the District of Columbia, and Puerto Rico. In 12 other states, most of the opiate addicts had never used marihuana. These alternative patterns of drug use were related to demographic factors: residence standard metropolitan statistical areas in the United States, state, sex, race, and age. A within-area comparison of marihuana users with nonusers revealed that the former addicts were significantly more deviant on most dependent variables: arrest record, early arrest, earlier onset of opiate use, intravenous administration, heroin use, and obtaining drugs from underworld sources.

BALTER, M. B. and LEVINE, J. The nature and extent of psychotherapeutic drug usage in the United States. Psychopharmacology Bulletin 5: 3-14 (1969)

BALTER, M. B., LEVINE, J. and MANHEIMER, D. I. Cross-national study of the extent of anti-anxiety/sedative drug use. New England Journal of Medicine 290:769 (April, 1974)

National samples of respondents in nine Western European countries were asked identical questions about their use of anti-anxiety/sedative drugs during the past year and about their general attitude toward tranquilizers. The proportion of persons who used anti-anxiety/sedative drugs on one or more occasions varied from 17 per cent in Belgium and France to 10 per cent in Spain. In almost every country the percentage of females who had used anti-anxiety/sedative drugs was approximately twice that of males. Persons 45 years of age and over were over-represented among drug users in all countries in relation to their presence in the national population. The rank order of the countries on attitude toward tranquilizers was poorly correlated with rank order on use rates. However, within each country there was a sharp difference in attitude between users and nonusers. Independent data place the United States in a middle position among the nine countries surveyed on use of anti-anxiety/sedative drugs.

BALTER, M. B., LEVINE, J. and RUBINSTEIN, I. Cross-national study of the extent of anti-anxiety/sedative drug use. Presented at the Eighth Congress of the Collegium Internationale Neuro-Psychopharmacologicum. Copenhagen, Denmark, 1972.

BENTLER, P. M. and EICHBERG, R. H. A social psychological approach to substance abuse construct validity: Prediction of adolescent drug use from independent data sources. Presented at the National Institute of Drug Abuse Drug Lifestyles Conference, St. Simons, Georgia, January, 1975.

For abstract, see Section I. Methodology of Drug Research.

BERLOW, L. Kids 'N Drugs. Chapel Hill, North Carolina: School of Pharmacy, University of North Carolina, 1971.

BLUM, R. H., editor. Society and Drugs, Vol. I. Students and Drugs, Vol. II. San Francisco, California: Jossey-Bass, Inc., 1969.

BOND, D. D., BRACELAND, F. J., FREEDMAN, D. X., FRIEDHOFF, A. J., KOLB, L. C. and LOURIE, R. S., editors. The Year Book of Psychiatry and Applied Mental Health, 1971. Chicago: Year Book Medical Publishers, Inc., 1971.

For abstract, see Section V. Adverse Effects, Toxicity and Genetic Effects.

BOURQUE, L. B. and BACK, K. W. Values and transcendental experiences. Social Forces 47:34-38 (September, 1968)

Ecstatic-transcendental experiences, or fundamental changes in the individual's level of consciousness, have been an integral part of human life, particularly religious movements, throughout most of the world. By concentrating on the experience itself, this study is designed to determine how common such experiences are in western society, whether such experiences are restricted to specifically religious contexts, and whether they can be related to various social and personality variables, including the individual's potential use of drugs. The subject population was composed of three groups: students from a traditionally white, southern university; students from a traditionally Negro southern college; and students from a hospital school of nursing. Essentially, two different types of ecstatic-transcendental experiences were discovered: one is primarily an "aesthetic" experience, which related to potential tendency to use drugs and greater self-confidence; the other is primarily a "religious" experience, which related to lower class, or minority group socioeconomic position, and high levels of social and religious value orientations.

BRACELAND, F. J., FREEDMAN, D. X., FRIEDHOFF, A. J., KOLB, L. C., LOURIE, R. S. and ROMANO, J., editors. The Year Book of Psychiatry and Applied Mental Health, 1973. Chicago: Year Book Medical Publishers, Inc., 1973.

For abstract, see Section V. Adverse Effects, Toxicity and Genetic Effects.

BRACELAND, F. J., FREEDMAN, D. X., FRIEDHOFF, A. J., LOURIE, R. S. and ROMANO, J., editors. The Year Book of Psychiatry and Applied Mental Health, 1972. Chicago: Year Book Medical Publishers, Inc., 1972.

For abstract, see Section V. Adverse Effects, Toxicity and Genetic Effects.

BREHM, M. L. and BACK, K. W. Self image and attitudes toward drugs. Personality 36: 299-314 (June, 1968)

Three hundred-thirty three introductory psychology students responded to a questionnaire on self image and on drugs. The questionnaire was divided into 3 main headings: attitudes (toward drugs); usage (of drugs); and self description. In terms of a positive association between attitudes and usage, the results suggest that insecurity relates to the use of all agents for both sexes. Curiosity, however, relates significantly only to the use of drugs. Thus, the dissatisfaction or feelings of inadequacy represented by the first attitude factor are reflected in a willingness to use any and all types of external agents to augment change; but the predominant element of curiosity to explore the potentialities of the self is associated only with a desire to use the more disinhibiting agents. For both sexes, fear of loss of control appears negatively related to the use of these same disinhibiting agents.

BRIDGE, T. P. and ELLINWOOD, E. H., JR. Quaalude alley: A one-way street. American Journal of Psychiatry 130(2): 217 (1972)

BRILL, N. Q. Longitudinal study of college marijuana users. Proceedings of the Twentieth Annual Conference of Air Force Behavioral Scientists. Brooks Air Force Base, San Antonio, Texas, September, 1973.

BRILL, N. Q. The marihuana problem. California Medicine 114(4): 55-57 (April, 1971)

BRILL, N. Q. The marihuana problem in perspective. Military Medicine 138(4): 205-210 (April, 1973)

BRILL, N. Q. and CHRISTIE, R. L. Marihuana use and psychosocial adaptation. Archives of General Psychiatry 31:713-719 (November, 1974)

For abstract, see Section IV. Behavioral Studies.

BRILL, N. Q., CRUMPTON, E., FRANK, I, M., HOCHMAN, J. S., LOMAX, P., McGLOTHLIN, W. H. and WEST, L. J. The marijuana problem. Annals of Internal Medicine 73:449-465 (1970)

For abstract, see Section V. Adverse Effects, Toxicity and Genetic Effects.

BRILL, N. Q., CRUMPTON, E. and GRAYSON, H. M. Personality factors in marihuana use. Archives of General Psychiatry 24: 163-165 (February, 1971)

Clinical observation of marihuana users have suggested that there are personality characteristics that are correlated with regular marihuana use. This study investigates the relationship of some personality factors to extent of marihuana use in young college students. Four groups of marihuana users differing in extent of use (from less than once per month to almost every day) were compared with two control groups on four MMPI scales, a risk-taking propensity scale, a stimulus-seeking scale, nine specially constructed items, and a number of demographic variables. More frequent use of marihuana was significantly related to higher scores on the stimulus-seeking scale, on the MMPI psychopathic Deviant Scale and to "true" responses to the items, "a person should not be punished for breaking a law that he thinks is unreasonable" and "as long as I can remember, I have had more emotional problems that other people." Regular use of marihuana was very significantly related to use of other drugs. There was no support in this sample of young functioning college students for hypotheses about impaired parental identification, goal-orientation, or the role of religion.

BROTMAN, R. and LIVENSTEIN, M. A. A role model for social workers in community mental health practice. Social Work 12(2): 21-26 (April, 1967)

A new role model for social workers in community organization--the organizer-educator--is presented to deal with some problems arising in community mental health practice. A primary objective for the practitioner is to mobilize and integrate the thoughts and actions of other professionals toward stated goals of change in care-delivery systems.

BROTMAN, R. E., SHAH, R. and SUFFET, S. L. Generational differences among drug abuse patients. International Journal of the Addictions 7(2): 219-235 (1972)

For abstract, see Section VII. Treatment-Related Research.

BROTMAN, R., SILVERMAN, I. and SUFFET, S.L. Some social correlates of student drug use. Crime and Delinquency 16: 67-74 (January, 1970)

BROTMAN, R. and SUFFET, S.L. Marijuana use and social control. Annals of the New York Academy of Sciences 191: 235-245 (December, 1971)

For abstract, see Section VII. Treatment-Related Research.

BROTMAN, R. and SUFFET, S.L. Marijuana users' views of marijuana use. The Psychopathology of Adolescence. New York: Grune and Stratton, Inc., 1970.

BRUNSWICK, A. F. Health needs of adolescents: How the adolescent sees them. American Journal of Public Health 59(9): 1730-1745 (1969)

Results are presented from a survey of how adolescents view their own health and their health needs, and of possible differences between 3 major ethnic groupings: Spanish-speaking, white, and Negro young people. The sample consisted of 122 adolescents, 12-17 years old, living in the Washington Heights section of New York. Findings indicate that: (1) They are concerned about their health and able to provide detailed information about their own feelings and perceptions regarding health matters; (2) major areas of interest were exercise, eating, smoking, and sleeping; (3) self-appraisal regarding dental health was more critical; (4) 4 of 10 wear eye glasses and more reported uncorrected visual problems; and (5) all groups were in general agreement on the major health and medical problems. One in 3 of the respondents considered drugs a major contemporary health problem, marihuana being the drug most widely used. These results are significant for those interested in improving health services and indicated a difference in general attitude toward health. Most Spanish and Negro youths expressed health concerns, with Negroes showing a conviction about the avoidability of illness and the Spanish showing considerable fatalism. Physical appearance was of major concern to Negro boys.

CARLIN, A. S., BAKKER, C. B., HALPERN, L. and POST, R. B. Social facilitation of marijuana intoxication: Impact of social set and pharmacological activity. Journal of Abnormal Psychology 80(2): 132-140 (1972)

To determine to what extent marijuana intoxication is the result of (a) drug effects, (b) expectancy and social setting, or (c) an interaction of all these factors, two experiments were devised. In Experiment I, Ss first swallowed a placebo pill and then smoked either two placebo cigarettes or two marijuana cigarettes containing a total of 15 mg. of delta-9-tetrahydrocannabinol (THC). The cigarettes were smoked in a setting designed to either facilitate intoxication (up night) or interfere with it (down night) through manipulation of S's expectancy and through modeling. Results indicate that the amount of marijuana smoked impaired cognitive functioning and was rated as more intoxicating than was the placebo. Manipulations of setting and belief had no effect. In Experiment II, Ss smoked two cigarettes containing either (a) placebo, or (b) 7.5 mg. of THC, or (c) 15 mg. of THC. The Ss who smoked placebo cigarettes first swallowed a pill containing either 10 mg. of Librium or 25 mg. of Librium. The Ss who smoked cigarettes containing THC received placebo pills. Smoking was done in either up night or down night contexts. Results suggest that social setting and belief interact with smaller doses of marijuana, but not with large doses nor with placebo.

CARLIN, A. S. and POST, R. D. Drug use and achievement. International Journal of the Addictions 9(3): 401-410 (1974)

The relationship between lowered achievement and nonmedical use of drugs has become a concern as drug use increases. Two hundred sixty-six young males, some of whom were marihuana smokers, and some of whom used other drugs also, were interviewed about their levels of achievement and drug use. It was found that lowered levels of achievement were associated with higher rates of drug experience for both marihuana and other psychedelic drugs. Goal setting varied as a function of the decision to use drugs or not, rather than amount of drugs used. These two findings, taken together, suggest that observed lowered achievement is not the result primarily of a change in values, but of perhaps several factors which are discussed.

CARLIN, A. S. and POST, R. D. Patterns of drug use among marihuana smokers. Journal of the American Medical Association 218: 867-868 (November 8, 1971)

One hundred and six male marihuana smokers were interviewed concerning their use of other drugs. Seventy-four percent admitted experimentation with psychedelic drugs and 6% experimented with heroin. Compared to earlier findings, use of psychedelic drugs seems to be growing, while use of heroin remains about the same.

CARLIN, A. S., POST, R. D., BAKKER, C. B. and HALPERN, L. M. The role of modeling and previous experience in the facilitation of marijuana intoxication. Journal of Nervous and Mental Disease 159(4): 275-281 (1974)

Ss without previous experience with marijuana smoked marijuana or placebo cigarettes in the presence of a model who exhibited marijuana-intoxicated behavior or did not. Marijuana naive Ss' self-ratings of intoxication were differentially affected by drugs and placebo, but were not affected by modeling. Performance on four of six cognitive measures was impaired by drug consumption. On one additional task, performance was impaired by modeling in conjunction with consumption of the active drug. In order to clarify the nature of the relationship between previous experience with marijuana and self-ratings of intoxication, a number of aposteriori analyses were carried out which compared performance, symptoms, and ratings of marijuana naive and experienced Ss. The results indicate that previous experience is a socialization process through which individuals learn to discriminate and label the drug state as intoxication.

CHAMBERS, C. D. An Assessment of Drug Use in the General Population. Special Report No. 1. Drug Use in New York State. New York: New York State Narcotic Addiction Control Commission, 1971.

The prevalence, incidence, frequency, and situational content of all types of drug use within the general population throughout New York State were assessed through face to face interviews of 7,500 persons. Also included in the survey are assessments of (1) accuracy of beliefs relative to the adverse effects of certain forms of drug misuse and abuse; (2) the visibility of persons who misuse or abuse drugs as reflected in the awareness of other persons of this misuse; and (3) attitudes toward various types of drug abuse and abusers. An epilog comments on the extent of current drug abuse, and appendixes present the interview schedules for respondents and details on the methodology of the study.

CHAMBERS, C. D. Barbiturate-sedative abuse: A study of prevalence among narcotic abusers. International Journal of the Addictions 4(1): 45-57 (1969)

Using only voluntary admissions to ensure a clinical basis for the diagnosis of addiction and only standard metropolitan statistical area residents to ensure that all subjects would have had access to similar illicit subcultures, 100 narcotic abusers consecutively admitted to the NIMH clinical research center at Lexington, Kentucky, during 1957 were compared with 100 narcotic abusers consecutively admitted during 1966. Empirical support was demonstrated for the clinical impression that barbiturate - sedative abuse and addiction among narcotic abusers increased significantly between 1957 and 1966. The clinical impression that barbiturate-sedative abuse and addiction are found more often in white than in Negro narcotic abusers was verified for 1957, but the significant race differences in both abuse and addiction had disappeared by 1966. Thus, the increased incidence of the abuse of and addiction to these drugs can be attributed primarily to the disproportionate increases among Negro heroin abusers. An evolutionary pattern of drug abuse was found. The data suggest that sex has never been a significant factor in the abuse of or addiction to barbiturates - sedatives. Race does appear to have been a significant factor in the past; with Negroes lagging behind white narcotic users in adopting the use of barbiturate - sedative drugs. By 1966, however, this race difference had disappeared and barbiturate-sedative use had become a prevalent pattern for both races. White abusers of barbiturates - sedatives are still more likely to become addicted to the drugs, once they begin using them, to the point of chronic intoxication. This difference may be related to time. In 1966, the addiction liability among Negroes did not differ from that found among whites in 1957. Since the racial differences in the incidence of barbiturate - sedative use and addiction disappeared over time, the racial differences in addiction liability are also expected to decrease and/or disappear. The data suggest the hypothesis that, given continuity of the current circumstances surrounding narcotic use, the incidence of barbiturate - sedative use and addiction among narcotic users may not significantly increase beyond the 1966 level. This hypothesis is supported by: 1) The relative stability of the white pattern of abuse and addiction to these drugs since 1957; and 2) the homogenizing effect of the standard metropolitan statistical area illicit drug subculture, wherein both races tend to secure their drugs from the same sources, tend to prefer the same drugs, and tend to administer the drugs in the same manner and setting.

CHAMBERS, C. D. Characteristics of attrition during ambulatory detoxification. Methadone: Experiences and Issues. Edited by C. D. Chambers and L. Brill. New York: Behavioral Publications, 1973. Pp. 195-202.

For abstract, see Section VII. Treatment-Related Research.

CHAMBERS, C. D. Narcotic addiction and crime: An empirical review. Drugs and the Criminal Justice System. Edited by J. A. Inciardi and C. D. Chambers. Beverly Hills, California: Sage Publications, 1974.

A review of empirical studies focusing upon the relationship between drugs and crime has identified a number of unrelated conclusions. At least for most contemporary narcotic addicts, criminal involvement is a part of their lifestyle prior to becoming addicted to narcotics but not necessarily prior to some drug experimenting. The vast majority of contemporary narcotic addicts support their addictions by committing crimes. Although the majority of crimes committed to support addictions involve the theft of goods which are then sold or traded to secure drugs, the rate at which addicts are turning to crimes against persons to secure money rather than goods and to the selling of drugs are both alarming. The risk of arrest and incarceration for drug related criminal activity are both extremely low. The younger narcotic addicts appear to be criminal opportunists: whatever criminal opportunity presents itself attracts this contemporary addict. Treatment does reduce the extent of criminal involvement of addicts but it does not eliminate this activity, and in most cases the curtailment is probably transitory.

CHAMBERS, C. D. and BALL, J. C. Suicide among hospitalized opiate addicts. The Epidemiology of Opiate Addiction in the United States. Edited by J. C. Ball and C. D. Chambers. Springfield, Illinois: Charles C. Thomas, 1970.

Suicides were analyzed at an inpatient medical and psychiatric hospital for opiate addicts. Between 1935 and 1967, 43,215 addicts had been admitted, and 13 of these committed suicide during their hospitalization. This rate of suicide, 3 per 10,000, is considerably less than rates reported for other inpatient psychiatric facilities and prisons. The rate is approximately 3 times greater than that for the general population. An analysis of the 13 suicides indicates that suicides among hospitalized opiate addicts usually do not occur among the younger addicts or among the novice addicts. Suicides do occur in both sexes, in races, and among patients from all social and familial backgrounds. It was found that suicide is not associated with prisoner or voluntary status in the hospital, time of day, nor psychiatric diagnosis at admission. The probable cause of suicide among hospitalized narcotic addicts include 1) the psychological and physiological discomfort of drug withdrawal; 2) physical illness not related to addiction; 3) difficulties of institutional adjustment; 4) the inability to accept the severity of legal punishment for crimes related to addiction; and 5) the inability to cope with the personal problems addiction brings to the addict and his family. There are indications that suicides occur even more frequently before and after hospitalization. Fifty female opiate addicts consecutively admitted to the Lexington Hospital were physically examined for visible signs of suicide gesturing. In this sample 14.0 percent had visible signs of prior suicide gesturing.

CHAMBERS, C. D., BRIDGE, T. P., PETERSEN, D. M. and ELLINWOOD, E. H., JR. Methaqualone: Another "safe" sedative? Journal of Drug Issues 4(2): 126-129 (Spring, 1974)

Statistics from Dade County, Florida, indicate that adverse reactions to Methaqualone occurs most frequently among the young who may have a dangerous inability of disinclination to properly manage their use of the drug. The high number of sedative alcohol overdose combinations reflects the major pattern of use of this drug. The disproportionate number (74 percent) aged 24 and under is suggestive that large amounts of these medications are illicitly obtained.

CHAMBERS, C. D., HINESLEY, R. K. and MOLDESTAD, M. The female opiate addict. The Epidemiology of Opiate Addiction in the United States. Edited by J. C. Ball and C. D. Chambers. Springfield, Illinois: Charles C. Thomas, 1970.

Female opiate addicts admitted for treatment at Lexington (Kentucky) and Fort Worth federal hospitals were studied to provide comprehensive source data on female opiate addicts through controlled race comparison. Negroes and whites were shown to differ significantly in childhood home status, occupational status, conjugal home status, and regional area of residence. The racial differences were also significant with respect to how they became addicted, what drugs were used, method of administration, and how drugs were evident in their life histories.

CHAMBERS, C. D. and MOFFETT, A. D. Negro opiate addiction. The Epidemiology of Opiate Addiction in the United States. Edited by J. C. Ball and C. D. Chambers. Springfield, Illinois: Charles C. Thomas, 1970.

The homogeneity of the contemporary Negro opiate addict is demonstrated. Comparisons of prehospitalization attributes (consanguine home status, marital status, formal education, and means of economic support) produced minor distribution differences, but these differences were not consistently affected by the experimentally independent variable of the sex of the addict. Comparison of these attributes with normal Negro groups revealed the addicts 1) were more likely to have come from a broken home, 2) were more likely to have been school dropouts, 3) were more likely to have been married, 4) were less likely to have kept a conjugal relationship intact, and 5) were less likely to have been legally employed. The addicts could be considered to be deviants even within the environment of the metropolitan area. Negro addicts have been shown to derive their economic support predominantly from illegal activities. The extent or absence of marihuana use in an addict's drug history may prove to be a valuable independent variable. The age of initial opiate experimentation, the likelihood of being arrested, of selling drugs, and of experimentation with other drugs appear affected by the extent of marihuana use. But the smoking of marihuana did not affect significantly the time at which formal education was terminated.

CHAMBERS, C. D., SHERIDAN, B. K. and WILLIS, T. Diffusion paths for a drug of abuse. Drug Abuse: Current Concepts and Research. Edited by W. Keup. Springfield, Illinois: Charles C. Thomas, 1972.

An examination of the diffusion paths for the abuse of propoxyphene hydrochloride (Darvon) within a Philadelphia Negro ghetto, a white southern middle class suburban community, and a Greenwich Village drug abuse area indicates a single legal source: the physician. In the first instance, all the propoxyphene was stolen, often from the medicine cabinets of families. The second instance involved high school girls who obtained the drug from a school nurse or from parents who also used the drug; the ostensible reason was to alleviate menstrual cramps. Of 12 subjects studied in the third instance, 7 had procured propoxyphene by medical prescription. The fact that prescriptives for propoxyphene are legal and open-ended seems to contribute to its abuse.

CHAPEL, J. L. Emergency room treatment of the drug-abusing patient. American Journal of Psychiatry 130(3): 257-259 (1973)

For abstract, see Section VII. Treatment-Related Research.

CHAPEL, J. L. and TAYLOR, D. W. Drugs for kicks. Crime and Delinquency 16(1): 1-35 (1970)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

CHAPEL, J. L. and TAYLOR, D. W. Glue Sniffing. Missouri Medicine 65(4): 288-296 (April, 1968)

A report on the practice of glue sniffing, the undesirable physical and psychological effects of sniffing, and suggestions for legal and community preventive measures is presented. Glue sniffing by adults and children is widespread and is considered a problem by school officials, organized medicine, and law enforcement agencies throughout the nation. There is some disagreement as to whether or not sniffing causes irreversible physical and mental damage. However, there is complete agreement on its high correlation with crime, sex, and antisocial behavior.

CISIN, I. H. and MANHEIMER, D. I. Marijuana use among adults in a large city and suburb. Annals of the New York Academy of Sciences 191: 222-234 (December, 1971)

CLARK, L. D. Marijuana and human behavior. Rocky Mountain Medical Journal 69(1): 43-46 (January, 1972)

For abstract, see Section IV. Behavioral Studies.

COHEN, C. P., WHITE, E. H. and SCHOOLAR, J. C. Interpersonal patterns of personality for drug-abusing patients and their therapeutic implications. Archives of General Psychiatry 24: 353-358 (April, 1971)

The Leary Interpersonal System was used to analyze interlevel relationships of personality among 80 drug-abusers and a control group matched for age and sex also seeking professional help but not abusing illicit drugs. Both groups were failing to actualize their ideals but controls wanted to be more assertive and self-sufficient while drug-abusers idealized passive hostility and dependence. Two new measures of "Identity Diffusion" and "Parental Assimilation" were introduced and revealed significant differences between the groups. Controls showed no severe identity problems and had assimilated an image of more nurturant mothers. Drug-abusers were seen to have identity problems of long-term duration and had not assimilated a maternal image which was perceived as managerial and narcissistic. Implications of these findings are discussed, including problems and possibilities for therapeutic intervention.

COHEN, M. and KLEIN, D. F. Age of onset of drug abuse in psychiatric inpatients. Archives of General Psychiatry 26: 266-269 (March, 1972)

This study investigated the relationship between age of onset of drug use and patterns of ensuing drug abuse of white, middle-class psychiatric patients, ranging in age from 15 to 25 years. The results for male patients show that the earlier the onset of drug use (ages 12 to 14), the greater the likelihood of becoming heavily involved with a variety of drugs, excepting heroin. Males who start using drugs after age 14 tend to become more involved with heroin use. For female patients, the earlier the age of onset of drug use, the more likely they are to become involved in all drugs, including heroin. Furthermore, for younger females (ages 12 to 14), drug use and promiscuity were both seen as manifestations of emotionally unstable, antisocial behavior.

COHEN, M. and KLEIN, D. F. Social values and drug use among psychiatric patients. American Journal of Psychiatry 128(8): 1017-1019 (February, 1972)

Two social values tests were given to young, middle-class drug abusers and to a control group of non-drug users to determine whether drug users rejected typical middle-class values significantly more often than non-drug users. The drug users rejected values that connoted the Protestant ethic more often than the non-drug users; however, they were not more rejecting of values, such as money, marriage, and job security, that would help them succeed in society.

COLE, J. O., FRIEDHOFF, A. J. and FREEDMAN, A. M., editors. Psychopathology and Psychopharmacology. Baltimore, Maryland: Johns Hopkins Press, 1972.

CRUMPTON, E. and BRILL, N. Q. Personality factors associated with frequency of marijuana use. California Medicine 115(3): 11-15 (September, 1971)

A number of personality and style-of-life variables were found to be significantly related to frequency of marijuana use, in a study of 1215 students on the University of California, Los Angeles, campus. Compared with the non-user, in composite the typical marijuana-user is somewhat depressed, more inclined to doubt his emotional adjustment. He likes to take risks and seeks stimulation; he has strong political opinions; he believes in punishment for law-breakers, but he is more likely to question it. He is not religious; he is less well identified with parents, and he has a lower opinion of their marital adjustment. He is not decisive about career goals; he is a fine arts or liberal arts major. He uses alcohol, sometimes in combination with marijuana; he first tried marijuana after entering college and is not increasing his use. The typical marijuana-user in the sample uses it infrequently, twice a month or less often, and is not likely to be using other drugs. The frequent user probably uses other drugs.

CUSHMAN, P., JR. Methadone maintenance treatment of narcotic addiction. New York State Journal of Medicine 72(13): 1752-1755 (July 1, 1972)

Decreased criminal behavior is frequently stated to result from methadone maintenance treatment of narcotic addiction. However, convincing documentation is urgently needed. In this study, New York City police records were used to measure the frequency of arrests before, during, and after methadone maintenance treatment of chronic heroin addicts attending a New York City methadone clinic.

CUSHMAN, P., JR. Relationship between narcotic addiction and crime. Federal Probation 38: 38-42 (September, 1974)

Despite the widely held assumption that there is a close association between narcotic addiction and some types of crime, there are very few reliable data, and many important questions. In particular, there is very little information about the relationships between crime and the natural history of narcotic addiction.

A longitudinal record of criminal activities of 269 addicts before and during narcotic addiction, and during methadone treatment, was studied using arrest records from New York City Police Criminal Records Division. Some conclusions can be reached regarding the relationship between crime in three phases of narcotic addiction: Before the onset of addiction, during the years of illicit narcotic use, and lastly, during methadone maintenance treatment.

DAHLBERG, C.C. Sexual behavior in the drug culture. Medical Aspects of Human Sexuality 5(4): 64-71 (April, 1971)

DAHLBERG, C. C. and JAFFE, J. Need good research destroy good therapy? Science and Psychoanalysis. Edited by E. H. Masserman. New York: Grune and Stratton, 1972. Pp. 173-186.

For abstract, see Section VII. Treatment-Related Research.

DAHLBERG, C. C., MECHANECK, R. and FELDSTEIN, S. LSD research: The impact of lay publicity. American Journal of Psychiatry 125(5): 685-689 (November, 1968)

An inquiry was sent to 29 investigators conducting research involving the use of LSD or other hallucinogens, in an effort to determine what effects publicity had negatively affected the recruitment of "appropriate" subjects, the attitudes of already participating subjects, the behavior of research personnel, and the continuation of several research projects.

DAVIS, F. and MUNOZ, L. Heads and freaks: Patterns and meanings of drug use among hippies. Journal of Health and Social Behavior (June, 1968)

For abstract, see Section VI. Drug Use/Abuse Prevention.

DAVIS, J.M., EL-YOUSEF, M.K., JANOWSKY, I.S. and SEKERKE, H.J. Treatment of benztropine toxicity with physostigmine. Fifth International Congress on Pharmacology 5: 52 (1972)

DeFLEUR, L. B. Biasing influences on drug arrest records: Implications for deviance research. American Sociological Review (February, 1975)

DeFOREST, J. W., ROBERTS, T. K. and HAYS, J. R. Drug abuse: A family affair? Journal of Drug Issues 4(2): 130-134 (Spring, 1974)

This investigation compares interpersonal behavior patterns of mothers of adolescent drug abusers with a comparison group of mothers reporting no drug abuse in their families. The Interpersonal System developed by Leary was used in comparing 31 mothers of drug abusers at the Texas Research Institute's Drug Abuse Clinic with a group of mothers matched for age, education, ethnic background, and socioeconomic status. The drug abuse mothers emerged as significantly more disidentified with their own mothers. Also, they described their husbands as significantly more critical and arrogant that did the control group. The drug abuse mothers described their children as significantly more resentful and bitter. Therapeutic and future research implications were suggested.

DeFOREST, J. W. and HAYS, J. R. Drugs: How much do parents know? St. Joseph Hospital Medical Surgical Journal 9(1): 7-11 (March, 1974)

A number of recent surveys have focused on the adolescent's use of drugs and his attitudes toward drug-taking behavior. These surveys generally have dealt with school children and were for the purpose of gathering information. While various programs of intervention and prevention have been designed as a result of such studies, they have been oriented primarily to the educational system; parents of teenage children have been largely overlooked in the research process.

The present study was designed to examine the drug attitudes and drug knowledge of parents. Such an investigation is necessary for two reasons: parents are the most important influence upon the child's attitudes toward life, and programs implemented by outside institutions can only be fully effective in the presence of parental cooperation and understanding. The objective of this project was to point up general trends in parental attitudes, to examine the parents' level of factual knowledge, and to provide some guideposts for further research.

DeLEON, G. Phoenix House: Psychopathological signs among male and female drug-free residents. Addictive Diseases: An International Journal 1(2): 135-151 (1974)

Measures on 7 scales of psychopathology were obtained for 200 drug addicts participating in the Phoenix House Therapeutic Community Program and analyzed by sex. Results showed the following: 1) Males and females consistently scored in the psychiatric range on all scales. The magnitude of the scores reduced with time in program for both sexes. 2) Scores dropped significantly for a subgroup of males and females retested after 7.5 months. 3) Male and female dropouts scored consistently higher than their counterparts who remained in the program. 4) Black males and females scored significantly lower than all other, and white males and females and Spanish females were highest. The meaning and modification of addiction requires clarification of psychological differences between males and females.

DeLEON, G., HOLLAND, S. and RESENTHAL, M. S. Phoenix House: Criminal activity of dropouts. Journal of the American Medical Association 222(6): 686-689 (November, 1972)

For abstract, see Section VII. Treatment-Related Research.

DEWEY, W. L. Behavioral procedures: An overview. Narcotic Antagonists. Edited by M. C. Braude, L. S. Harris, E. L. May, J. P. Smith and J. E. Villarreal. Advances in Biochemical Pharmacology, Vol. 8. New York: Raven Press, 1973. Pp. 415-416.

For abstract, see Section I. Methodology of Drug Research.

DORNBUSH, R. L., CLARE, G., ZAKS, A., CROWN, P., VOLAVKA, J. and FINK, M. 21-day administration of marijuana in male volunteers. Current Research in Marijuana. Edited by M. F. Lewis. New York: Academic Press, Inc., 1972.

DORNBUSH, R., FINK, M. and FREEDMAN, A. M. Marijuana, memory and perception. American Journal of Psychiatry 128(2): 194-198 (August, 1971)

The effect of high and low doses of marijuana on behavioral and physiological responses was studied in male medical school volunteers. Short-term memory, reaction time, EEG, and heart rate were significantly affected by the higher dose; time estimation and blood sugar were not differentially affected by either dose.

DuTOIT, B. M. Dagga: The history and ethnographic setting of Cannabis Sativa in Southern Africa. Cannabis and Culture. Edited by V. Rubin. The Hague: Mouton Publishers, 1975.

DWARSHUIS, L. Police-community relationships in innovative drug programs. Journal of Forensic Psychology (Winter, 1973)

DWARSHUIS, L., KOLTON, M. and GORODEZKY, M. Social dynamics of drug abuse. Developing a City Drug Program, Public Management 54(3): 23 (March, 1972)

EICHBERG, R. H. and BENTLER, P. M. Current issues in the epidemiology of drug abuse as related to psychosocial studies of adolescent drug use. Presented at the National Institute on Drug Abuse Drug Lifestyles Conference, St. Simons, Georgia, January, 1975.

For abstract, see Section I. Methodology of Drug Research.

ELLINWOOD, E. H., JR. Amphetamine psychosis: A multi-dimensional process. Seminars in Psychiatry 1(2): 208-226 (May, 1969)

For abstract, see Section V. Adverse Effects, Toxicity and Genetic Effects.

ELLINWOOD, E. H., JR. Amphetamine psychosis: II. Theoretical implications. Journal of Neuropsychiatry 4(1): 45-54 (1968)

For abstract, see Section V. Adverse Effects, Toxicity and Genetic Effects.

ELLINWOOD, E. H., JR. Assault and homicide associated with amphetamine abuse. American Journal of Psychiatry 127(9): 1170-1175 (March, 1971)

The author describes the histories of 13 persons who committed homicide while intoxicated with amphetamines. In most of these cases, the events leading to the homicidal act were directly related to amphetamine-induced paranoid thinking, panic, emotional lability, or lowered impulse control. The most important variables associated with these cases included predisposing personality, environmental circumstances, and the use of other drugs.

ELLINWOOD, E. H., JR. Cultural disparity between generations and drug use. Drug Addiction: Clinical and Socio-legal Aspects, Vol. II. Edited by J. Singh. Mount Kisco, New York: Futura Publishing Company, 1972. Pp. 97-105.

FELDMAN, H. W. The street system, drugs, and the military service. Confronting Drug Abuse. Edited by A. A. Sorensen. Philadelphia, Pennsylvania: Pilgrim Press, 1972. Pp, 61-77.

FELDSTEIN, S., CHESTER, P. and FINK, M. Psychological differentiation and the response of opiate addicts to pharmacological treatment. British Journal of Addiction 68:151-157 (1973)

The degrees of psychological differentiation of 21 opiate dependent males, as measured by the Embedded Figures Test, were found to be unrelated to their scores on a self-report questionnaire (HAQ) which a previous study had shown capable of distinguishing between addicts who do and do not respond well to an heroin antagonist. The HAQ, however, has sufficiently high internal consistency to warrant further exploration of its usefulness.

FIDELL, L. S. Put her down on drugs: Prescribed drug usage in women. Presented at the Western Psychological Association Meeting, Anaheim, California, April 12, 1973.

FINK, M. Drug models in schizophrenia. Psychopathology and Psychopharmacology. Edited by J.O. Cole, A.J. Friedhoff and A.M. Freedman. Baltimore, Maryland: Johns Hopkins Press, 1972. Pp. 108-111.

FINK, M. Drugs, EEG, and behaviour: EEG profiles and bioavailability measures for clinical psychopharmacology. Electroencephalography and Clinical Neurophysiology 34: 754 (1973)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

FINK, M. and ITIL, T. M. EEG and human psychopharmacology. IV: Clinical antidepressants. Psychopharmacology: A Review of Progress, 1957-1967. Edited by D. Efron, J. Cole, J. Levine and J. R. Wittenborn. Washington, D. C.: U. S. Government Printing Office, 1968. Pp. 671-682.

For abstract, see Section I. Methodology of Drug Research.

FINK, M. and SHAPIRO, D. M. EEG-profile for psychopharmacology: A progress report. Electroencephalography and Clinical Neurophysiology 31: 103-106 (1971).

For abstract, see Section I. Methodology of Drug Research.

FRACCHIA, J.F., FIORENTINO, D., SHEPPARD, C. and MERLIS, S. A comparison of techniques for the scoring of avoidable errors on the Raven Progressive Matrices. Journal of Psychology 72: 93-98 (1969)

For abstract, see Section I. Methodology of Drug Research.

FRACCHIA, J., FIORENTINO, D., SHEPPARD, C. and MERLIS, S. Raven Progressive Matrices avoidable errors as a measure of psychopathological ideational influences upon reasoning ability. Psychological Reports 26: 359-362 (1970)

For abstract, see Section I. Methodology of Drug Research.

FRACCHIA, J., SHEPPARD, C. and MERLIS, S. Early cigarette smoking and drug use: Some comments, data and thoughts. Psychological Reports 34:371-374 (1974)

This paper considers some recently reported cigarette smoking and drug-use data which indicate teenage smokers have a greater probability of using or becoming involved with illicit drugs than non-smoking peers. It is suggested that the epidemiological concept of high risk groups be applied to relationship between the use of socially approved substances like tobacco by young people and subsequent drug experiences because it acknowledges the empirical covariance between these events but does not have as strong causal implications as a "stepping.stone" notion. By this, it is implied that a person who begins smoking, for example, at age 10 when his reference group will begin at age 15, may be more likely to become involved with substance abuse. Further suggested the decision to use drugs is an individual one which appears to be influenced by a multiplicity of factors as availability, personal needs, values, peer influences, personality characteristics and previous behavioral tendencies.

FRACCHIA, J., SHEPPARD, C. and MERLIS, S. Some comments about the personality comparison of incarcerated and street heroin addicts. Psychological Reports 33: 413-414 (1973)

This note questions the assumption that the greater personality deviance seen in the MMPI profiles of street heroin addicts than in those of incarcerated heroin addicts is a function of environmental and situational differences between these samples. The street addicts' elevations on the scales comprising the neurotic triad may instead represent a drug effect.

FRACCHIA, J., SHEPPARD, C., RICCA, E. and MERLIS, S. Interrelations among psychological needs of suburban heroin addicts. Psychological Reports 35:559-562 (1974)

Among the 15 variables assessed by the EPPS for 59 male and female applicants to a suburban methadone maintenance program the pattern, direction and magnitudes of correlations between need states were significantly different from those of the normative sample. The implications of the tendency of addicts to associate positively a number of incompatible needs for: (1) counseling, (2) generating interpersonal conflict, and (3) understanding the addict as an individual were discussed.

FREEDMAN, A. M. and BROTMAN, R. E. Multiple drug use among teenagers: Plans for action -- research. Drugs and Youth. Proceedings of the Rutgers Symposium on Drug Abuse. Edited by J. R. Wittenborn, H. Brill, J. P. Smith and S. A. Wittenborn. Springfield, Illinois: Charles C. Thomas, 1969.

FREEDMAN, A. M., FINK, M., SHAROFF, R. and ZAKS, A. Clinical studies of cyclazocine in the treatment of narcotic addiction. American Journal of Psychiatry 124(11): 1499-1504 (May, 1968)

For abstract, see Section VII. Treatment-Related Research.

GOLDSTEIN, J. W. Getting high in high school: The meaning of adolescent drug usage. Presented at Students and Drugs Symposium, Annual Meeting of the American Educational Research Association, New York, New York, February 7, 1971.

Psychoactive drug users have been consistently shown to differ from nonusers on a variety of demographic and psychological characteristics. These data are summarized from our study, The Social Psychology and Epidemiology of Drug Usage. Included are data on patterns of use, relationships of use with attitudes of and use by one's friends, educational level of the beginning of use, and attitudes and values related to use. The problem of deciding upon the meaning of usage under circumstances of increasing numbers of users, the several levels of causal analysis possible, and the tendency to make value judgments about the user's motivation is discussed. A parsimonious value-free model of usage is suggested. The model is related to the traditional problems of adolescence and of secondary education. Suggestions for alleviating these problems, including the reform of school practices, are made. Problems related to drug usage are seen to lie in the social-cultural context of use rather than in the drug itself. Finally, a scheme calling for the user to be his own initial clinical diagnostician is proposed.

GOLDSTEIN, J. W. Motivations for psychoactive drug use among students. Readings in the Essentials of Abnormal Psychology. Edited by B. Kleinmantz. New York: Harper and Row, 1974.

Drug usage is a complex behavior with multiple causes. Motivational causal analysis is useful in specifying who within a given demographic category is most likely to engage in this behavior. In the past, however, personality analyses of usage motivation and causation have often been used to stigmatize users and to deprecate their usage. Studies comparing degree of usage of a given drug and personality scales show impressive similarity of findings. The similarity of personality profiles of users of a wide variety of drugs with each other is also impressive and only recently has attracted the attention of investigators. For example, teenage cigarette smokers, college student marijuana users, college student amphetamine users, college student drinkers, and Haight-Ashbury multiple drug users all score lower than nonusers of these drugs on scales assessing satisfaction with self and higher on scales assessing flexibility. Detailed data on amphetamine, marijuana and hard liquor use by a university freshman class (N=752), tested during their first days at college, was obtained as part of a major all-university drug study. Comparisons of scores and scale configurations on the California Psychological Inventory and on the Allport-Vernon-Lindzey Study of Values reveal substantial agreement in the pattern of user-nonuser differences for all three substances.

Rather than label drug-taking behavior as "pathological" it is suggested that a value-free model of approach and avoidance forces be used to better clarify the relationships between the various usage correlates discovered to date. Such an approach has the additional virtue of helping to prevent the exacerbation of personal and social difficulties (the "drug problem problem") which sometimes accompany efforts to combat drug usage. Labeling adherants of deviate behavior as pathological often is disguised circular reasoning; further, it increases the likelihood that they will be treated unjustly while not advancing understanding of causation or, where needed, treatment. To lessen the problems of drug abuse we must separate it from drug use by criteria based upon deleterious effects, not merely on unauthorized use, and when we do this we find that the amount of drug abuse which exists is but a small fraction of even illicit use. Motivational analyses which distinguish between users and abusers are now needed to guide therapy with abusers and to help us in understanding the relationships between innocuous and deleterious use.

GOLDSTEIN, J. W. Narcotics and Alcoholism. Hearings before the Subcommittee on Alcoholism and Narcotics of the Committee on Labor and Public Welfare, United States Senate, Pittsburgh, Pennsylvania, January 18-19, 1971. Washington, D. C.: U.S. Government Printing Office, 1971.

GOLDSTEIN, J. W. Students' evaluations of their psychoactive drug use. Journal of Counseling Psychology (in press)

For abstract, see Section V. Adverse Effects, Toxicity and Genetic Effects.

GOLDSTEIN, J. W., GLEASON, T. C. and KORN, J. H. Whither the epidemic? Psychoactive drug use career patterns of college students. Journal of Applied Social Psychology (in press)

Reported nonmedical use and intentions for future use of eight groups of psychoactive drugs were conceptualized and arrayed to represent an individual's usage career. Intentions closely predicted usage eight months later. Changes in career were analyzed from data obtained in surveys of all students at a university in 1968 and three follow-up surveys of the Class of 1972. In 1968, the most common order of extent of use of the drug groups was: beer, hard liquor, tobacco, cannabis, depressants, amphetamines, hallucinogens, and narcotics. Students' starting, usage and intent patterns for the drugs displayed hierarchical, Guttman-like, scalability in approximately this order. Intentions to progress to new drugs on the scale were strong in all classes in 1968. In the Class of 1972, however, despite growing experience with the less common drugs as they went through college, intentions to return to more common drugs grew and intentions to progress to new ones decreased, relative to both themselves as freshmen and to equivalent level classes in 1968. The pattern of these changes suggests that it is hazardous to extrapolate from early usage and intent data in predicting the long term course of usage.

GOODE, E. The Marijuana Smokers. New York: Basic Books, Inc., 1970.

GOODE, E. Multiple drug use among marijuana smokers. Social Problems 17:48-64 (Summer, 1969)

HOCHMAN, J. S. and BRILL, N. Q. Chronic marijuana use and psychosocial adaptation. American Journal of Psychiatry 130(2): 132-140 (February, 1973)

For abstract, see Section IV. Behavioral Studies.

HOLLANDER, C., editor. Collection of Background Papers on Student Drug Involvement. Washington, D.C.: United States National Student Association, 1967.

HOLLISTER, L. E. Marihuana in man: Three years later. Science 172: 21-28 (April 2, 1971)

For abstract, see Section II. Drug Chemistry and Metabolism.

HOLLISTER, L. E. and GILLESPIE, H. K. Marihuana, ethanol, and dextroamphetamine. Archives of General Psychiatry 23: 199-203 (September, 1970)

Twelve normal volunteer subjects were treated with marihuana (median dose equivalent to 32 mg tetrahydrocannabinol), ethanol (median dose 57 gm), dextroamphetamine (median dose 15 mg), and a marihuana placebo. Assignment to treatments was random over weekly intervals. Subjective responses based on a mood scale revealed increased stimulation and activity, as well as decreased drowsiness from dextroamphetamine as compared with placebo; ethanol and marihuana decreased activity. Dextroamphetamine tended to improve performance on psychometric tests; the other two drugs tended to impair it. Time estimation was longer with marihuana than with the other treatments, yet because the latter were associated with gross underestimates, marihuana estimates most closely approximated the actual interval being estimated. Dextroamphetamine increased performance on the digit-symbol substitution test. Ethanol and marihuana increased simple reaction time.

Marihuana and ethanol were most alike in their effects, with the particular exception of the alteration in time perception produced by the former drug. On the other hand, dextroamphetamine was essentially unlike the other two drugs and was the only one which improved, rather than impaired, performance even in nonfatigued subjects.

HUGHES, P. H., BARKER, N. W., CRAWFORD, G. A. and JAFFE, J. H. The natural history of a heroin epidemic. American Journal of Public Health 62(7): 995-1001 (July, 1972)

Incidence data are presented describing an epidemic of heroin addiction among Negro youth in Chicago following World War II. The epidemic reached its peak in 1949 and declined during the early 1950's. This report examines the effects of a variety of societal control measures on the epidemic's decline, and the implications of the readings for addiction control programs.

HUGHES, P. H. and JAFFE, J. H. Heroin epidemics in Chicago. Proceedings of the Fifth World Congress of Psychiatry, Mexico City, November 28-December 4, 1971. Pp. 1416-1424.

HURST, P. M., RADLOW, R., CHUBB, N. C. and BAGLEY, S. K. Drug effects upon choice behavior in mixed motive games. Behavioral Science 14(6): 443-452 (November, 1969)

For abstract, see Section IV. Behavioral Studies.

INCIARDI, J. A. and CHAMBERS, C. D., editors. Drugs and the Criminal Justice System. Beverly Hills, California: Sage Publications, 1974.

Fundamental questions regarding the response of the criminal justice system to the problems of drug dependence are raised by several authors. Drug abuse and crime are put in an historical perspective which suggests that drug related crime is often a function of irrational and unenforceable drug laws. Available treatment for drug dependent persons within the criminal justice system is reviewed and its shortcomings are discussed. The notion that drug dependence causes much or most crime is shown to have little empirical evidence to support it. Attention is focused on the mythology of drug dependence and its relationship to existing drug laws.

JAFFE, J., DAHLBERG, C. C., LURIA, J., BRESKIN, S., CHOROSH, J. and LORICK, E. Speech rhythms in patient monologues: The influence of LSD-25 and dextroamphetamine. Biological Psychiatry 4(3): 243-246 (1972)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

JAFFE, J., DAHLBERG, C. C., LURIA, J. and CHOROSH, J. Effects of LSD-25 and dextroamphetamine on speech rhythms in psychotherapy dialogues. Biological Psychiatry 6(1): 93-96 (1973)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

JANOWSKY, D.S., EL-YOUSEF, M.K. and DAVIS, J.M. Interpersonal maneuvers of manic patients. Scientific Proceedings of the American Psychiatric Association 126: 267-268 (1973)

JANOWSKY, D.S., EL-YOUSEF, M.K., DAVIS, J.M. and SEKERKE, H.J. Psychologic effects of physostigmine in psychiatric patients and normal volunteers. Fifth International Congress on Pharmacology 5: 115 (1972)

JESSOR, R. and JESSOR, S. L. The perceived environment in behavioral science: Some conceptual issues and some illustrative data. American Behavioral Scientist 16(6): 801-828 (July-August, 1973)

Achieving an analytically useful conceptualization of the environment of human action and its relation to personality has been one of the most refractory problems in behavioral science. The problem has resulted in polarization of workers within the same discipline and in relatively insuperable barriers between disciplines. In the present paper, we discuss some of the conceptual issues involved and focus on what we consider to be a key notion -- the perceived environment -- in any general resolution of the problem. Data from our current longitudinal research are presented to illustrate the explanatory utility of the perceived environment concept and to demonstrate its amenability to operational specification.

JESSOR, R., JESSOR, S. L. and FINNEY, J. A social psychology of marijuana use: Longitudinal studies of high school and college youth. Journal of Personality and Social Psychology 26(1) 1-15 (1973)

Problem behavior theory, consisting of personality, perceived environment, and behavior systems, was employed to account for variation in marijuana use among junior high, senior high, and college students, both male and female. The research design enabled both cross-sectional comparisons between nonusers and users on variables in each of the systems and longitudinal comparisons between those who shifted to user status over a 1-year interval and those who remained nonusers. Data revealed a similar pattern of personality, environment, and behavior differences between all nonuser and user groups, suggesting a pervasive social-psychological constancy. The same variables were also predictive of the shift from nonuse to use over time among the high school students but not the college students.

JESSOR, S. L. and JESSOR, R. Maternal ideology and adolescent problem behavior. Developmental Psychology 10(2): 246-254 (1974)

The relationship of maternal traditional ideology to adolescent problem behavior was assessed in a correlational study. Mothers of 184 junior and senior high school students were interviewed about their beliefs about society and morality and about their child-rearing practices; their sons and daughters responded separately to questionnaires that included reports of their own behavior with respect to alcohol use, marijuana use, sex, and political activism. The results of the correlational analyses supported the main hypothesis that the more traditional the mother's ideology, the less the adolescent's involvement in problem behavior. A second hypothesis, that maternal affectional interaction and controls, when taken in conjunction with ideological beliefs, would contribute to a stronger account of the variation in adolescent problem behavior, was partially supported. In general, the associations between mother's ideology and adolescent behavior were stronger for daughters than for sons.

JONES, R. T. The marijuana induced "high": Influence of expectation, setting and previous drug experience. Pharmacological Review 23: 359-369 (1971)

JONES, R. T. The marijuana induced "social high": A note of caution. Proceedings of the Western Pharmacological Society 14:21-25 (1971)

The attitude and expectations of the subject, and the social setting are important determinants of the subjective effects produced by marijuana. This report described two experiments on the effects of these factors. The first experiment involved 100 experienced marijuana smokers, mainly students, aged 21-30 years. Previous marijuana use varied from a total of 5 to 5 cigarettes/day with a mean of 4/month. Subjects were tested on 2 occasions. They smoked marijuana on one occasion and placebo on the other. They were told they might be given inactive marijuana. The treatments were assigned in a double-blind balanced order. The marijuana was from the California Bureau of Narcotic Enforcement, grown in Western Mexico.

JONES, R. T. Tetrahydrocannabinol and the marijuana-induced social "high," or the effects of the mind on marijuana. Annals of the New York Academy of Sciences 191: 155-165 (1971)

JONES, R. T. and STONE, G. C. Psychological studies of marijuana and alcohol in man. Psychopharmacologia 18(1): 108-117 (1970)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

KANDEL, D. Adolescent marihuana use: Role of parents and peers. Science 181: 1067-1070 (September, 1973)

In order to examine the relative influence of parents and peers on marihuana use among adolescents, independent data have been obtained from adolescents, their parents, and their best school friends in a sample of secondary school students in New York State. The data indicate that drug use by peers exerts a greater influence than drug use by parents. Friends are more similar in their use of marihuana than in any other activity or attitude. Parental use of psychotropic drugs has only a small influence, mostly related to maternal use. Peer and parental influences are synergistic; the highest rates of marihuana usage are observed among adolescents whose parents and friends are drug users.

KANDEL, D. Inter and Intragenerational influences on adolescent marijuana use. Journal of Social Issues 30(2): 107-135 (1974)

To investigate inter- and intragenerational influences in adolescent marijuana use, a survey was undertaken on a representative sample of public secondary school students in New York State. Independent data were obtained from adolescents, their parents, and their best-school-friends. These relational data document the crucial role which members of the same generation play in adolescent illegal drug use. Involvement with other drug-using adolescents is a more important correlate of adolescent marijuana use than is parental use of psychoactive drugs or alcohol (which provides a small influence). Inter- and intragenerational influences are synergistic, however. The highest rates of marijuana usage are observed among adolescents whose parents and best friends are drug users. Interactional generational factors influence levels of intragenerational influences. Implications of these data for parental and peer influence, the generation gap, and social change are discussed.

KANDEL, D. Interpersonal influences on adolescent illegal drug use. Drug Use: Epidemiological and Sociological Approaches. Edited by E. Josephson and E. E. Carroll. New York: Hallstead Publishing Corporation, 1974.

KANDEL, D. Reaching the hard-to-reach: Illicit drug use among high school absentees. Addictive Diseases (in press)

For abstract, see Section I. Methodology of Drug Research.

KANDEL, D. Some comments on the relationship of selected criteria variables to adolescent drug use. Presented at the National Institute on Drug Abuse Drug Lifestyles Conference, St. Simons, Georgia, January, 1975.

KESKINER, A., SIMEON, J., FINK, M. and ITIL, T. M. Long acting phenothiazine (fluphenazine decanoate) in the treatment of psychosis. Archives of General Psychiatry 18: 477-481 (1968)

A long-acting depot phenothiazine, fluphenazine decanoate, was active in the therapy of the severe mentally ill for periods of 7 to 21 days after a single intramuscular injection of 0.5 to 3.0 cc (12.5 to 75 mg.), both as the initial treatment and as a substitute for other psychotropic drugs.

Of 24 chronic psychotic patients, 13 were discharged within six months of treatment, 4 were considered dischargeable, and 7 did not improve. The extrapyramidal symptoms appeared with a frequency, type, and severity similar to those seen with other piperazine phenothiazines and were readily controlled by antiparkinson drugs.

Fluphenazine decanoate is an active long-acting depot psychotropic drug with significant advantages of convenience.

KLINE, F. G., MILLER, P. V., MORRISON, A. J. and FREDIN, E. S. The basis for adolescent information acquisition about drugs and alcohol -- A uses and gratification approach. Presented at the International Conference on Drug Education, Copenhagen, Denmark, June, 1974.

KORN, J. H. and GOLDSTEIN, J. W. Psychoactive drugs: A course evaluation. Journal of Drug Education 3(4): 353-368 (Winter, 1973)

Evidence is presented concerning achievement of cognitive objectives in a college course on drugs. A mastery grading system insured that students learned to criterion. Reported experience with drugs did not change during the course and was unrelated to measures of learning and student ratings of the course and the instructors. Concern for friend's drug usage did increase and changes were observed in preferred sources of advice and information about drugs.

McAREE, C. P., STEFFENHAGEN, R. A. and ZHEUTLIN, L. S. Personality factors and patterns of drug usage in college students. American Journal of Psychiatry 128: 890 (1972)

Under a grant of immunity from prosecution, the authors tested 100 student drug users and 100 nonusers, who also had immunity. They categorized the drug users as marijuana-only users, multiple-drug users, or gross-multiple-drug users. Using the Minnesota Multiphasic Personality Inventory as a criterion, they found that the gross-multiple users had the highest incidence of abnormal profiles and that they, as well as the multiple users, evidenced more psychopathology than the marijuana-only users or the nonusers.

McAREE, C. P. STEFFENHAGEN, R. A. and ZHEUTLIN, L. S. Personality factors in college drug users. International Journal of Social Psychiatry 15: 102 (1969)

McAULIFFE, W. E. and GORDON, R. A. A test of Lindesmith's theory of addiction. The frequency of euphoria among long-term addicts. American Journal of Sociology 79(4): 795-840 (January, 1974)

For abstract, see Section I. Methodology of Drug Research.

McCABE, O. L., KURLAND, A. A. and SULLIVAN, D. Paroled narcotic addicts in a verified abstinence program: Results of a five year study. International Journal of the Addictions (in press)

McCABE, O. L., KURLAND, A. A. and SULLIVAN, D. A study of methadone failures in an abstinence program. International Journal of the Addictions (in press)

MADDUX, J. F. and DESMOND, D. P. Obtaining life history information about opioid users. American Journal of Drug and Alcohol Abuse 1: 181 (1974)

MADDUX, J. F. and DESMOND, D. P. Reliability and validity of information from chronic heroin users. Journal of Psychiatric Research (in press)

MANDELL, A. J. Neurobiological barriers to euphoria. American Scientist 61(5): 565-573 (September-October, 1973)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

MANHEIMER, D. I., DAVIDSON, S. T., BALTER, M. B., MELLINGER, G. D., CISIN, I. H. and PARRY, H. J. Popular attitudes and beliefs about tranquilizers. American Journal of Psychiatry 130: 11 (November, 1973)

In a nationwide survey of the extent and nature of psychotherapeutic drug use, respondents were also questioned about their knowledge of tranquilizers and their attitudes toward the use of these drugs in general and in specific situations. The survey revealed surprising similarities of attitudes across demographic subgroups. Although respondents believed in the efficacy of tranquilizers and were willing to condone their use in some specific circumstances, they also had doubts about their long-term effects and about the morality of using them. Doubts about the morality of using tranquilizers were associated with traditional stoic values.

MANHEIMER, D. I. and MELLINGER, G. D. Marijuana use among urban adults. Science 166: 1544-1545 (December, 1969)

A relatively high proportion of young adults in San Francisco have used marijuana one or more times. The proportion in this age group who have used marijuana is as great among nonstudents as among students.

MANHEIMER, D. I. and MELLINGER, G. D. The psychotropic pill taker -- Will he talk? Public Opinion Quarterly 31: 436-437 (Fall, 1967)

The purpose of this study was to obtain quantitative descriptions of how people obtain and use psychotropic (i.e. mood-changing) drugs, including stimulants, sedatives, and tranquilizers. Three methodological issues confronted the investigators. First, how candid would respondents be in discussing their use of psychotropic drugs? Second, would they be willing to report ways of obtaining such drugs that are questionable from an ethical, legal, or medical point of view? And, third, even if they are willing to admit use of such drugs, would they be able to recall which drugs they have used and identify them by name?

MANHEIMER, D. I., MELLINGER, G. D. and BALTER, M. B. Psychotherapeutic drugs: Use among adults in California. California Medicine 109: 445-451 (December, 1968)

MANHEIMER, D. I., MELLINGER, G. D. and BALTER, M. B. Use of marijuana among an urban cross-section of adults. Communication and Drug Abuse. Edited by J. R. Wittenborn, J. P. Smith and S. A. Wittenborn. Springfield, Illinois: Charles C. Thomas, 1970. Pp. 225-243.

MANHEIMER, D. I., MELLINGER, G. D., SOMERS, R. H. and KLEMAN, M. T. Technical and ethical considerations in data collection. International Journal of the Addictions (in press)

MELLINGER, G.D. The psychotherapeutic drug scene in San Francisco. Drug Abuse: Data and Debate. Edited by P.H. Blachly. Springfield, Illinois: Charles C. Thomas, 1970. Pp. 226-240.

In summary, data from a cross-section sample of adults in San Francisco indicate that the following:

1. The use of psychotherapeutic drugs to deal with various kinds of emotional needs and distress is very widespread, and there is little reason to believe that these drugs will be used any less widely as time goes on.
2. If people cannot, or choose not to, get these drugs from physicians, the fact is that they are getting them elsewhere. Among young people, especially, there appears to be a considerable deterioration in the physician's traditional role as gatekeeper in the drug distribution system. However, drugs obtained from nonmedical sources appear, for the most part, to be used on a relatively casual and infrequent basis.
3. The extent to which the physician is still the primary source of drugs depends not only on the age and sex of the user, but also on the need for which drugs are sought. In a society which places great value on energy, it is a rather interesting paradox that the medical system apparently is not viewed, either by its practitioners or its clients, as an appropriate place to obtain energizing drugs.

In closing, it is our belief that any discussion of the drug problem must consider two exceedingly important issues. First why are people using these drugs? If certain patterns of drug use are "bad," then are they not symptomatic of a more fundamental problem, i.e. the pressures and tensions of society which create emotional distress? And second, what acceptable alternatives does society provide to the use of psychotherapeutic drugs? We have seen that the desire for energy and stimulation is syphoned off to some extent by the relatively innocuous over-the-counter drugs. But the younger generation recognizes that these drugs are not really very potent, and they have learned where to find more effective alternatives. The pressing question we must try to answer is what do we have to offer them that is better?

MELLINGER, G.D. Psychotherapeutic drug use among adults: A model for young drug users? Journal of Drug Issues 1: 274-285 (1971)

MELLINGER, G.D., BALTER, M.B. and MANHEIMER, D.I. Patterns of psychotherapeutic drug use among adults in San Francisco. Archives of General Psychiatry 25: 383-394 (November, 1971)

Data on use of psychotherapeutic drugs were obtained in personal interviews with a cross-section sample of adults in San Francisco. Proportions using such drugs during the year prior to interview were 45% for women and 33% for men. Prevalence of use, however, varies greatly by sex and age of person, by therapeutic class, and by intended and actual source of drug. Persons between 45 and 59 are more likely than others to use prescription drugs from medical sources. Use of over-the-counter drugs and prescription drugs obtained from nonmedical sources is most prevalent among persons 18 to 29. Overall, prevalence of psychotherapeutic drug use is highest among persons under 30. Persons who obtain prescription drugs from nonmedical sources are more likely than others to use a variety of drugs, but are less likely to use any drug regularly.

MILLER, L.L., editor. Marijuana: Effects on Human Behavior. New York: Academic Press, 1974.

For abstract, see Section I. Methodology of Drug Research.

MIRIN, S.M., SHAPIRO, L.M., MEYER, R.E., PILLARD, R.C. and FISHER, S. Casual versus heavy use of marijuana: A redefinition of the marijuana problem. American Journal of Psychiatry 127: 1134-1140 (March, 1971)

Twelve heavy and 12 casual users of marijuana generally found the experience to be a pleasurable one. In contrast to casual smokers, heavy users of marijuana tended to use multiple drugs and demonstrated a significant incidence of psychic dependence on marijuana. Their search for insight or for a meaningful affective experience colored their motivation for drug use. Experience with multiple drugs was also associated with poor social and work adjustment; goal-directed activity and ability to master new problems were diminished.

PARRY, H.J. Patterns of psychotropic drug use among American adults. Journal of Drug Issues 1: 269-273 (1971)

PARRY, H.J. Use of psychotropic drugs by U.S. adults. Public Health Reports 83(10): 799-810 (October, 1968)

PARRY, H.J., BALTER, M.B., MELLINGER, G.D., CISIN, I.H. and MANHEIMER, D.I. National patterns of psychotherapeutic drug use. Archives of General Psychiatry 28: 769 (June, 1973)

Data on national patterns of use of psychotherapeutic drugs derived from a national sample of American adults. During the year preceding the interview, 13% of the men and 29% of the women had used such prescription drugs -- in particular minor tranquilizers and daytime sedatives. Prevalence of prescription drug use varies greatly by sex, age, and region of the country.

Comparable data from Europe indicate American rates to be consonant with those for other Western industrialized nations. Findings suggest Americans are rather conservative in their use of prescription psychotherapeutic drugs and that most of the users felt they had benefited from the drugs. Over-the-counter drugs were used by 10% of adults, most commonly by respondents age 18 to 29. Over-the-counter use is short-term and most users reported little or no benefit.

PARRY, H.J. and CISIN, I.H. Students, parents, and drugs. Today's Education: NEA Journal (May, 1973)

PARRY, H.J., CISIN, I.H. and BALTER, M.B. Concomitants of marihuana use among Americans aged 18-29. Special Report D-1. Washington, D.C.: Social Research Group, The George Washington University, 1972.

PILLARD, R.C. Marijuana is not a public health menance: It is time to relax our social policy. Controversy in Internal Medicine II. Edited by F.J. Ingelfinger, M. Finland, A. Relman and R. Elbert. Philadelphia, Pennsylvania: W.B. Saunders and Company, 1974.

PILLARD, R.C. Medical progress. Marihuana. New England Journal of Medicine 283: 294-303 (August, 1970)

PRATHER, J.E. and FIDELL, L.S. Medical advertising: Is it a reinforcement for drug abuse? Presented at the First National Drug Abuse Conference, Chicago, Illinois, March 30-April 1, 1974.

PRATHER, J. and FIDELL, L.S. Patient sex differences in the content and style of medical advertisements. Social Science and Medicine (in press)

PRATHER, J. and FIDELL, L. Put her down and drug her up! Presented at American Sociology Association, New Orleans, Louisiana, August, 1972.

RANDRUP, A. and MUNKVAD, I. Evidence indicating an association between schizophrenia and dopaminergic hyperactivity in the brain. Orthomolecular Psychiatry 1: 2-7 (1972)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

ROBBINS, T., ANTHONY, D. and CURTIS, T. Youth culture religious movements: Evaluating the integrative hypothesis. Sociological Quarterly (February, 1975)

For abstract, see Section VI. Drug Use/Abuse Prevention.

ROFFMAN, M., REDDY, C. and LAL, H. Control of morphine-withdrawal hypothermia by conditional stimuli. Psychopharmacologia 29: 197-201 (1973)

For abstract, see Section IV. Behavioral Studies.

SALZMAN, C., VAN DER KOLK, B.A. and SHADER, R.I. Marijuana and hostility in a small group setting. Presented at the American Psychiatric Association Meeting, May, 1975.

SCHIØRRING, E. Can we change the behavior and attitude of adolescents to ingestion of euphoriant drugs? Folkeskolen 36 and 37 (1971)

SCHIØRRING, E. and RANDRUP, A. Social isolation and changes in the formation of groups induced by amphetamine in an openfield test with rats. Advances in Neuro-Psychopharmacology. Edited by O. Vinar, Z. Votava and P.B. Bradley. Amsterdam, the Netherlands: North-Holland Publishing Company, 1971.

SCHOOFF, K.G., EBNER, E., LOWY, D.G. and HERSCH, R.G. Comparison: Inner-city and suburban heroin users. Presented at 126th Annual Meeting of the American Psychiatric Association, Honolulu, Hawaii, May, 1973.

SCHOOLAR, J.C., WHITE, E.H. and COHEN, C.P. Drug abusers and their clinic-patient counterparts: A comparison of personality dimensions. Journal of Consulting and Clinical Psychology 39(1): 9-14 (1972)

For abstract, see Section VII. Treatment-Related Research.

SCOTT, J.P. Effects of psychotropic drugs on separation distress in dogs. Presented at the 9th Congress Collegium Internationale Neuropsychopharmacologicum, Paris, France, July 11, 1974.

For abstract, see Section IV. Behavioral Studies.

SEEVERS, M.H. Psychologic dependence defined in terms of individual and social risk. Psychic Dependence. Edited by L. Goldberg and F. Hoffmeister. New York: Springer-Verlag, 1973. P. 25.

SEGAL, B. Drug use, alcohol use and nonuse of either as a function of personality: A replicated and cross-validated study. Presented at the Fifth International Institute on the Prevention and Treatment of Drug Dependence, Copenhagen, Denmark, July, 1974.

SEGAL, B. and MERENDA, P.F. Locus of control, sensation seeking, and drug and alcohol use in college students. Drug Forum (in press)

For abstract, see Section VI. Drug Use/Abuse Prevention.

SHEPPARD, C., FIORENTINO, D., COLLINS, L. and MERLIS, S. Comparison of emotion profiles as defined by two additional MMPI profile types in male narcotic addicts. Journal of Clinical Psychology 25(2): 186-188 (April, 1969)

Concurrent and construct validity were reported indicating that narcotic users with different character structures have measurable differences in emotion profiles. A sample of male narcotic users with a 42' MMPI configuration was compared with a sample having five or more MMPI scales 5' within the pathological range and an F scale score less than 80. These groups differed significantly on four of eight prototypic emotion dimensions. The 5' group were lower on dimensions of incorporation and reproduction, and higher on rejection and destruction, thus minimizing feelings of well being while emphasizing destructive prototypic emotions.

SHEPPARD, C., FIORENTINO, D., COLLINS, L. and MERLIS, S. Performance errors on Ravens Progressive Matrices (1938) by sociopathic and schizotypic personality types. Psychological Reports 23: 1043-1046 (1968)

For abstract, see Section I. Methodology of Drug Research.

SHEPPARD, C., FIORENTINO, D., COLLINS, L. and MERLIS, S.S. Ravens Progressive Matrices (1938): Normative data on male narcotic addicts. Psychological Reports 23: 343-348 (1968)

The Ravens Progressive Matrices (RPM), a test of intellectual ability, was administered to 396 male narcotic users. Norms are given, and concepts basic to the validity and reliability of the RPM tested. Significant shifts were found in item order in sets A, B, C, and D. Differences were not considered crucial for each set, which was progressively more difficult than the preceding set; thus the total structure of the test was supported by the sample. The discriminative power of most items ranged from good to excellent. In investigating properties of distractors, answer four was chosen significantly more often than other alternatives as the wrong answer in sets C, D and E identifying the possible operation of a positional distractor. Test-retest reliability, content and concurrent validity coefficients were of the order of .8. Correlation or formal education with RPM was of the order of .2. Previously available normative data on patient samples are extended and use of the RPM as a measure of intellectual performance relatively free from language and cultural bias is supported.

SHEPPARD, C., FIORENTINO, D. and MERLIS, S. Affective differential: Comparison of emotion profiles gained from clinical judgment and patient self-report. Psychological Reports 22: 809-814 (1968)

Narcotic addicts comprising 2 diagnostic groups as defined by MMPI profile types (49' sociopathic and 468' paranoid) were selected to test the validity of emotion profiles gleaned from affective differential ratings, the affective differential methodology and the assumption that patients with different character structures have measurable differences in emotion profiles. Comparisons were made between the patient groups and between profiles gleaned from clinicians' ratings and the patients' self-reports. Emotion profile differences were demonstrated between paranoid and sociopathic patient groups. The clinicians' ratings tended to exaggerate the intensity of the emotions, making differences between profile types greater than those differences observed from patient self-reports. The results supported the hypothesis that persons with different character structures have different emotion profiles but not to the degree first reported by clinicians.

SHEPPARD, C., FRACCHIA, J., RICCA, E. and MERLIS, S. Indications of psychopathology in male narcotic abusers, their effects and relation to treatment effectiveness. Journal of Psychology 81: 351-360 (1972)

The Minnesota Multiphasic Personality Inventory Report was administered to 336 male narcotic addicts admitted to a special treatment unit at Central Islip State Hospital. Ninety-four percent of these patients had measurable pathology as reflected in T scores of 70 or above. The data supported the hypothesis that addicts form a heterogeneous psychopathological sample. Specific diagnostic subgroups can be identified which should require different treatment modalities. Each of these diagnostic groups have base-rate expectations of treatment effectiveness when addiction is not an attended difficulty. Comparisons of treatment effectiveness of addict subgroups should be made with regard to these base-rate data, rather than to some more global criteria for a total addict sample. It may in fact be unrealistic, for example, to expect a treatment program for schizophrenic addicts to be more efficacious than a treatment program for schizophrenic nonaddicted patients, which is in fact one error we continue to commit. Hypotheses of this type are readily tested.

SHEPPARD, C., RICCA, E., FRACCHIA, J. and MERLIS, S. Indications of psychopathology in applicants to a county methadone maintenance program. Psychological Reports 33: 535-540 (1973)

The MMPI was completed by 74 applicants to a Suffolk County methadone maintenance program. All had measurable psychopathology as reflected in T scores of 70 or above on one or more of the original clinical scales. Data demonstrated heterogeneity in MMPI protocol code types, character structure, and psychopathological indications. Comparisons with previously reported data for addict samples committed to federal and state treatment units indicates fewer neurotic and sociopathic, but more schizotypic, incipient schizophrenic, or schizophrenic personality types applying to the methadone maintenance clinic. The most prevalent code type seen (842'), however, was identical with that reported for a sample of 117 patients seen at a VA methadone maintenance clinic.

SHEPPARD, C., RICCA, E., FRACCHIA, J. and MERLIS, S. Personality characteristics of urban and suburban heroin abusers: More data and another reply to Sutker and Allain (1973). Psychological Reports 33: 999-1008 (1973)

Sutker and Allain (1973) suggest that nonincarcerated heroin addicts who are involved in the "street life style" would tend to obtain elevated scores on the Hs, D, Hy and Pd scales of the MMPI. If these findings were cross-validated, then personality descriptions of addicts would have to be modified accordingly. Also, improvement measured by decreases on the Hs and Hy scales soon after entering a drug-free environment may be a result of milieu differences rather than personality change. Four groups of heroin addicts, two hospitalized, urban drug abusers who were free of drug influence at testing ($Hospitalized_1$ and $Hospitalized_2$) were compared with two street addict samples, one from an urban ($Street_{NARA}$), the other a suburban ($Street_{SCNCC}$) environment. It was hypothesized that both the $Street_{NARA}$ and $Street_{SCNCC}$ groups would score significantly higher than the hospitalized groups. As was expected, the street samples scored statistically higher on the Hs and Hy scales. However, data for the D and Pd scales failed to cross-validate the Sutker-Allain hypothesis. These data suggest that personality characteristics play a more dominant role in MMPI score elevations than the "street life style." This contention was also supported by test-retest data on the $Hospitalized_2$ sample measuring the effect of 90 days of hospitalization in a drug-free environment.

SHEPPARD, C., RICCA, E., FRACCHIA, J. and MERLIS, S. Psychological needs of suburban male heroin addicts. Journal of Psychology 87: 123-128 (1974)

The Edwards Personal Preference Schedule (EPPS), an objective test of Murray's theory of personality development, was completed by 51 male applicants to a county methadone maintenance program.

Tests of significance (t) were applied to the suburban heroin addict sample ($n = 51$) and to the general adult male normative sample ($n = 4031$) data to determine if they scored differently on the 15 EPPS psychological need constructs. Because of the disproportionate sample sizes, a hypothetical sample ($n = 51$) was drawn from the normative sample for comparative purposes.

Questions raised in these analyses were the following: Do heroin addicts differ in psychological need structure from the general adult male population? What motivates and directs behavior? What are the factors leading to the psychological availability to abusing drugs? What may make addicts resistant to psychotherapy?

SHEPPARD, C., RICCA, E., FRACCHIA, J., ROSENBERG, N. and MERLIS, S. Cross-validation of a heroin addiction scale from the Minnesota Multiphasic Personality Inventory. Journal of Psychology 81: 263-268 (1972)

For abstract, see Section I. Methodology of Drug Research.

SIMEON, J., KESKINER, A., FINK, M. and ITIL, T.M. Depot fluphenazine facilitation of treatment of psychosis. Changing Patterns in Psychiatric Care. Edited by T. Rothman. New York: Crown, 1970.

For abstract, see Section VII. Treatment-Related Research.

SINGLE, E., KANDEL, D. and FAUST, R. Patterns of multiple drug use in high school. Journal of Health and Social Behavior (in press)

As part of a larger investigation into adolescent drug use, the patterns of multiple drug use are examined in a representative sample of 8,206 New York public secondary school students. Among the 35% of adolescents reporting illicit drug use, the majority are polydrug users having used other illicit drugs besides marihuana. Furthermore, the use of any drug, legal or illegal, is positively correlated with the use of any other drug. A series of scalogram analyses reveals that patterns of illicit drug use fit the Guttman scale model. The use of illicit drugs other than marihuana rarely takes place in the absence of marihuana use. However, the use of legal drugs such as tobacco and alcohol also scales with the use of illicit drugs. Public concern over adolescent drug use should not focus solely upon the use of illegal drugs, since progressive involvement with drugs on the part of youth begins with the use of alcohol and tobacco rather than with marihuana.

SNYDER, S.H. Amphetamine psychosis: A "model" schizophrenia mediated by catecholamines. American Journal of Psychiatry 130(1): 61-67 (January, 1973)

Because of its close clinical similarity to acute paranoid schizophrenia, amphetamine psychosis may serve as a useful experimental model for schizophrenia. Molecular and clinical studies suggest that both the schizophrenia-like symptoms of amphetamine psychosis and the specific ability of phenothiazines to relieve the symptoms of schizophrenia and amphetamine psychosis may be the result of interactions with dopamine systems in the brain. The author discusses some implications of the roles dopamine and norepinephrine may play in mediating some schizophrenic symptoms.

SOSKIN, W., Children of the Good Life. A Second Interim Report on Project Community, Berkeley, California, March, 1972.

STEFFENHAGEN, R.A. Motivation for drug and alcohol use: A social perspective. Paper for the Symposium Concerning Research on Methods and Programs of Drug Education, Toronto, Ontario, Canada, October 22-25, 1973.

STEFFENHAGEN, R.A., SCHMIDT, F.E. and McAREE, C.P. Emotional stability and student drug use. Journal of Drug Education 1: 347 (December, 1971)

The focus of this paper is upon college drug use as it relates to the individual student user. As with the academic dropout, the college drug user is seen as reflecting an emotional problem and possibly is one and the same phenomenon. Drug use is merely symptomatic of an untoward reaction of emotional problems. The MMPI scale analysis is used as a measure of emotional stability. Drug users and non-users are analyzed to indicate and predict the extent of emotional problems within the college population. It is our contention that most contemporary effort directed solely toward the control and prevention of drug use on campus is in error. The concern about drug use is secondary. The real problem is one of helping the problem student achieve a better emotional adjustment while in college.

Student Association for the Study of Hallucinogens, Inc. CNS depressants. A STASH literature review. Grassroots (November, 1974 Supplement)

Student Association for the Study of Hallucinogens, Inc. MDA. STASH Capsules 5(1) (February, 1973)

Student Association for the Study of Hallucinogens, Inc. The relationship between drug advertising and drug misuse. A STASH literature review. Grassroots (January, 1974 Supplement)

Student Association for the Study of Hallucinogens, Inc. STASH fact sheet on cocaine. Grassroots (February, 1972 Supplement)

Student Association for the Study of Hallucinogens, Inc. STASH fact sheet on DOM ("STP"). Grassroots (July, 1972 Supplement)

Student Association for the Study of Hallucinogens, Inc. STASH fact sheet on methadone. Grassroots (May, 1972 Supplement)

Student Association for the Study of Hallucinogens, Inc. STASH fact sheet on opioids. Grassroots (November, 1972 Supplement)

Student Association for the Study of Hallucinogens, Inc. STASH fact sheet on psilocybin. Grassroots (August, 1972 Supplement)

Student Association for the Study of Hallucinogens, Inc. STASH notes: Methaqualone. STASH Capsules 5(3) (May-June, 1973)

Student Association for the Study of Hallucinogens, Inc. STASH notes: A mini-review of the 1973 marijuana literature, Part I. STASH Capsules 6(2) (March-April, 1974)

Student Association for the Study of Hallucinogens, Inc. STASH notes: A mini-review of the 1973 marijuana literature, Part II. STASH Capsules 6(3) (May-June, 1974)

IX

Education

IX. Education

ABRAMS, L.A., GARFIELD, E. and SWISHER, J., editors. Accountability in Drug Education: A Model for Evaluation. Washington, D. C.: Drug Abuse Council, 1973.

BROTMAN, R. and SUFFET, F. Youthful Drug Use. Washington, D. C.: U.S. Government Printing Office, 1970.

Drug Abuse Education Project, Pacific School of Religion. A Drug Abuse Curriculm Guideline for Use in Clergy Training Institutions. Berkeley, California: Pacific School of Religion, 1973.

GOLDSTEIN, J.W. Drug education worthy of the name. Impact: The Magazine for Innovation and Change in Counseling 1(4): 18-24 (1972)

GOLDSTEIN, J.W. Getting high in high school: The meaning of adolescent drug usage. Presented at Students and Drugs Symposium, Annual Meeting of the American Educational Research Association, New York, New York, February 7, 1971.

For abstract, see Section VIII. Psychosocial Studies.

GOLDSTEIN, J.W. Narcotics and Alcoholism. Hearings before the Subcommittee on Alcoholism and Narcotics of the Committee on Labor and Public Welfare, United States Senate, Pittsburgh, Pennsylvania, January 18-19, 1971. Washington, D. C.: U.S. Government Printing Office, 1971.

HUGHES, P.H. and JAFFE, J.H. Heroin epidemics in Chicago. Proceedings of the Fifth World Congress of Psychiatry, Mexico City, November 28-December 4, 1971. Pp. 1416-1424.

LEVY, M.R. Resource Book for Drug Abuse Education. Washington, D. C.: American Association for Health, Physical Education, and Recreation, 1970.

LEVY, S.J. and EUKER, C. Post Treatment Occupational and Educational Services for the Former Drug Abuser in New York City. A Model for an Occupational and Educational Information Referral Service and an Employment Service. Albany, New York: Bureau of Occupational Education Research, State Education Department, 1973.

For abstract, see Section VII. Treatment-Related Research.

MANHEIMER, D.I., MELLINGER, G.D., SOMERS, R.H. and KLEMAN, M.T. Technical and ethical considerations in data collection. Proceedings of the First International Conference on Student Drug Surveys. Edited by S. Einstein and S. Allen. Farmingdale, New York: Baywood Publishing Company, 1972.

Nearly 2000 male students at the University of California (Berkeley), some 90% of the sample, cooperated in lengthy personal interviews as part of a longitudinal study of changing life styles and values. This paper reviews the pretesting of interview questions, selection and training of interviewers, and similar procedures that elicited such a high completion rate.

MOORE, S.R. Drug Education '74. Chapel Hill, North Carolina: University of North Carolina, School of Pharmacy, 1974.

MORALES, R.R. An evaluation of five drug abuse education projects. D. East Los Angeles school drug program. Drugs in Our Schools. Hearings before the Select Committee on Crime, House of Representatives, Los Angeles, California, December 8-9, 1972.

Report of the Panel on the Impact of Information on Drug Use and Misuse. Phase II: Evaluating Drug Information Programs. Washington, D.C.: National Academy of Sciences, National Research Council, Assembly of Behavioral and Social Sciences (July, 1973)

Southern Regional Education Board. Beyond the Three R's. Training Teachers for Affective Education. Atlanta, Georgia: Southern Regional Education Board, 1974.

Southern Regional Education Board. Doing Drug Education. The Role of the School Teacher. Atlanta, Georgia: Southern Regional Education Board, 1972.

Southern Regional Education Board. State plans for drug and alcohol education and issues in program licensing. Southern Regional Education Board Conference, Atlanta, Georgia, July, 1973.

SPEEDY, G.A. Operation Reach Guidebook for Explorers. Boy Scouts of America, 1971.

SPEEDY, G.A. Operation Reach Guidebook for Posts. Boy Scouts of America, 1971.

SPEEDY, G.A. Operation Reach Guidebook for Scouts. Boy Scouts of America, 1971.

SPEEDY, G.A. Operation Reach Guidebook for Troops. Boy Scouts of America, 1971.

SPEEDY, G.A. Reaching. Scouting Magazine (January, 1972)

Student American Pharmaceutical Association. Project Speed. Washington, D.C: Student American Pharmaceutical Association, 1974.

Student Association for the Study of Hallucinogens, Inc. STASH fact sheet on the British narcotic system. Grassroots (October, 1972 supplement)

WEPPNER, R.S., WELLS, K., McBRIDE, D.C. and LADNER., R.A. The effects of criminal justice and medical definitions of a social problem upon the delivery of treatment. Journal of Health and Social Behavior (in press)

The knowledge that social scientists have about drug abusers and drug abuse has been obtained from a population defined and often provided by the criminal justice system. As a result, this knowledge of drug abuse has been limited, generally, to those who use illicit drugs. In this paper, selected social and demographic characteristics and drug use patterns of a population of county hospital emergency room drug overdose cases were examined and compared to a population of drug users in drug treatment programs in the same county. It was found that drug users who came to the emergency room, in comparison to drug users in treatment, were more likely to be female, older and abusers of prescription drugs. In addition, it was found that the existing treatment programs in the county in their present structure seem to be unable to adequately provide treatment services to the drug using emergency room population.

X

Epidemiological Studies and Surveys

X. Epidemiological Studies and Surveys

ABRAMS, L.A., GARFIELD, E. and SWISHER, J., editors. Accountability in Drug Education: A Model for Evaluation. Washington, D.C.: Drug Abuse Council, 1973.

AMSEL, Z., FISHMAN, J.J., RIVKIND, L., KAVALER, F., KRUG, D., CLINE, M., BROPHY, F. and CONWELL, D. The use of the narcotics register for follow-up of a cohort of adolescent addicts. International Journal of the Addictions 6(2): 225-239 (June, 1971)

The narcotics register has been shown to be a useful tool for the follow-up of a group of addicts. Over 53 percent of the 247 patients studied were known to the register. The reporting system of the register prior to 1963 was dependent on legislation requiring reports only from medicial sources. The amendments to the city health code extending this requirement to include all resources and assuring the confidentiality of these reports influenced the increased volume of reporting in later years. The rapport that has developed between the register and the reporting agencies shows the promise of cooperative research in which agency records might be much promise of cooperative research in which agency records might be much more extensively utilized than in the present study. The follow-up in this report was based almost exclusively on routinely reported information. The most important finding of this study was the high mortality in the cohort. It is apparent from the causes of death noted on the death certificates that mortality in the majority of cases was directly related to drug use. The mortality rate among the drug abusers in this cohort, even when compared with that in poverty areas, seems excessively high and merits attention. Based on the high level of cooperation the register has received in conducting this follow-up study, future follow-up and/or evaluation studies appear totally feasible. Any such studies would presumably involve greater attention to specific therapeutic data and/or correctional experiences of cohorts suitable for long-term evaluation.

BABST, D.V., CHAMBERS, C.D. and WARNER, A. Patient characteristics associated with retention in a methadone maintenance program. British Journal of the Addictions 66: 195-204 (1971)

For abstract, see Section VII. Treatment-Related Research.

BADEN, M. M. Homicide, suicide, and accidental death among narcotic addicts. Human Pathology 31(1): 91-95 (1972)

The number of cases of homicide, suicide, and accidental death among narcotic addicts in New York City is presented. In 1971 there were 280 of these violent deaths in addition to 1,000 deaths directly due to narcotic uses. Homicide is the common cause of death. Of the 215 homicides, 146 were caused by gunshot. Other causes were stabbing (59), assault (5) and strangulation (5). Of the 19 suicides, 8 were by hanging, 2 were by jumping, 1 by gunshot, 4 by drugs other than narcotics, and 4 by other means. It is impossible to determine suicidal death by heroin unless a note is left. Of the 46 accidental deaths, 21 were from falls from heights, 8 were from vehicular accidents, 9 from head injuries, 5 from drowning and 3 from fires. The association of violent death and addiction is often overlooked or not recoreded when the drug use does not directly cause death.

BADEN, M. M. Narcotic abuse: A medical examiner's view. New York State Journal of Medicine 72(7): 834-840 (April, 1972)

Narcotic addiction is discussed from the point of view of the medical examiner in New York City. In 1918, the year the office was established, there were approximately 50 deaths per year due to narcotice abuse. Deaths decreased around the time of the second world war, but have steadily increased since 1960 to a total of 1,016 in 1969. Deaths from heroin abuse are the result of the manner in which the drug is taken: in unknown amounts with unknown diluents and without regard for sterile precautions. An acute fatal reaction following intravenous injection is the major cause of death of addicts and is commonly inaccurately referred to as overdose. Actually, a pharmacologic overdose is rare, most causes being either an allergic type reaction or a reaction to injected bacteria. It is difficult to determine the actual cause of death because usually no data are available on the circumstances of death or on the decreaed. At autopsy, the most striking finings are external: scars, fibrosed veins and subcutaneous abscesses. The internal findings are unremarkable because there are no lesions specific for chronic narcotic use. There is a high incidence of homicidal, suicidal and accidental death among addicts. Although abuse of barbiturates, amphetamines, marihuana, hallucinogens, and tranquilizers is probably much more widespread than is abuse of narcotics, and deaths are not as common, perhaps because these drugs usually are taken in relatively known amounts and by mouth. The initial identification of a parenteral drug user can usually be made by physical examination. However, continued use of drugs, or identification of drug users could be determined by urine testing. The major modalities for treating drug abusers are therapeutic communities and drug substitition maintenance programs.

BALL, J. C. and CHAMBERS, C. D., editors. The Epidemiology of Opiate Addiction in the United States. Springfield, Illinois: Charles C. Thomas, 1970.

For abstract, see Section VI. Drug Use/Abuse Prevention.

BALL, J.C. and CHAMBERS, C.D. Overview of the problem. The Epidemiology of Opiate Addiction in the United States. Edited by J.C. Ball and C.D. Chambers. Springfield, Illinois: Charles C. Thomas, 1970. Pp. 5-21.

The principle epidemiological aspects of opiate addiction in the U.S. are discussed. Areas of discussion include the extent of opiate addiction; geographic distribution; age distribution of opiate addicts; sex and race; type of opiate to which addicted; nativity and mobility; education and intelligence of addicts; occupation; criminality; major cultural groups and etiology of addiction.

BALL, J.C., CHAMBERS, C.D. and BALL, M.J. The association of marihuana smoking with opiate addiction in the United States. Journal of Criminal Law, Criminology and Police Science 59(2): 171-182 (1968)

For abstract, see Section VIII. Psychosocial Studies.

BALL, J.C., ENGLANDER, D.M. and CHAMBERS, C.D. The incidence and prevalence of opiate addiction in the United States. The Epidemiology of Opiate Addiction in the United States. Edited by J.C. Ball and C.D. Chambers. Springfield, Illinoi Charles C. Thomas, 1970. Pp. 63-73.

BALTER, M.B., LEVINE, J. and MANHEIMER, D.I. Cross-national study of the extent of anti-anxiety/sedative drug use. New England Journal of Medicine 290: 769 (April, 1974)

For abstract, see Section VIII. Psychosocial Studies.

BENTLER, P.M. and EICHBERG, R.H. A social psychological approach to substance abuse construct validity: Prediction of adolescent drug use from independent data sources. Presented at the National Institute on Drug Abuse Drug Lifestyles Conference, St. Simons, Georgia, January, 1975.

For abstract, see Section I. Methodology of Drug Research.

BERBERIAN, R.M. Differential rates of drug use among black and whites, affluent and non-affluent adolescents. Presented at the 102nd Annual Meeting of the American Public Health Association, New Orleans, Louisiana, October 24, 1974.

BERBERIAN, R.M. Drug use among adolescents. Presented at the 100th Annual Meeting of the American Public Health Association, Atlantic City, New Jersey, November 14, 1972.

BERBERIAN, R.M. and ROSENBERG, J.S. Changing patterns of drug use. Presented at the 101st Annual Meeting of the American Public Health Association, San Francisco, California, November, 1973.

BERBERIAN, R. M. and THOMPSON, W. D. The relationship between drug education and changes in drug use. Presented at the North American Congress on Alcohol and Drug Problems, San Francisco, California, December, 1974.

BLACKFORD, L. S-C. Do high school students who use LSD tend to avoid alcoholic beverages? Presented at the 100th Annual Meeting of the American Public Health Association, Atlantic City, New Jersey, November 14, 1972.

It is obvious, as far as the exploration has proceeded, that the use of LSD and alcohol are associated positively. There is still a possibility that further analysis could show that there are several clusterings of drug use, and there could be some special pattern of drug use involving LSD, barbiturates and amphetamines without the use of alcohol and tobacco. There has not been time for the analysis to proceed that far. Additional manipulation of the existing data is scheduled in the near future. This includes the examination of class/sex cohorts over several years. With this caution, the paper is concluded.

It must be reiterated that absolutely no information produced from this study would indicate any order of use of drugs by an individual. We cannot say that the use of LSD leads to the use of alcohol, or vice versa.

BLACKFORD, L. S-C. Surveillance of levels of drug use in a student population. Drug Forum 1(3): 307-313 (April, 1972)

For abstract, see Section I. Methodology of Drug Research.

BLOOM, R., HAYS, J. R. and WINBURN, G. M. Marijuana use in urban secondary schools: A three-year comparison. International Journal of the Addictions 9(2): 329-335 (1974)

For abstract, see Section VI. Drug Use/Abuse Prevention.

BLUM, R. H., editor. Society and Drugs, Vol. I. Students and Drugs, Vol. II. San Francisco, California: Jossey-Bass, Inc., 1969.

BOURQUE, L. B. and BACK, K. W. Values and transcendental experiences. Social Forces 47: 34-38 (September, 1968)

For abstract, see Section VIII. Psychosocial Studies.

BOYINK, N. O., HAYS, J. R. and WINBURN, G. M. Rural, urban, and white flight: The Texas Drug Studies. St. Joseph Hospital Medical Surgical Journal 9(1): 18-24 (March, 1974)

For abstract, see Section VI. Drug Use/Abuse Prevention.

BREHM, M. L. and BACK, K. W. Self image and attitudes toward drugs. Personality 36: 299-314 (June, 1968)

For abstract, see Section VIII. Psychosocial Studies.

BRILL, N.Q. and CHRISTIE, R.L. Marihuana use and psychosocial adaptation. Archives of General Psychiatry 31: 713-719 (November, 1974)

For abstract, see Section IV. Behavioral Studies.

BROTMAN, R. and SUFFET, F. Youthful Drug Use. Washington, D.C.: U.S. Government Printing Office, 1970.

BROWN, J.W., GLASER, D., WAXER, E. and GEIS, G. Turning off: Cessation of marijuana use after college. Social Problems 21(4): 527-538 (April, 1974)

Marijuana use among recent alumni reflects prior diffusion of a student subculture with a variety of correlated norms and values. Constraints of family and job, and change of associates after graduation, foster cessation of such drug use more often than complete change from the other values of this subculture. Diffusion of norms and values of the student subculture among educated young adults off campus is evident in many alumni not much involved in this subculture as students, especially in those who are late starters at marijuanae use. Twice as high a rate of volunteering for interviews was elicited from long-term users as from non-users, suggesting that non-conformity and aberrant behavior foster opposite types of pluralistic ignorance of the prevalence of deviance.

BRUNSWICK, A.F. Health needs of adolescents: How the adolescent sees them. American Journal of Public Health 59(9): 1730-1745 (1969)

For abstract, see Section VIII. Psychosocial Studies.

CHAMBERS, C.D. An Assessment of Drug Use in the General Population. Special Report No. 1. Drug Use in New York State. New York: New York State Narcotic Addiction Control Commission, 1971.

For abstract, see Section VIII. Psychosocial Studies.

CHAMBERS, C.D. Barbiturate-sedative abuse: A study of prevalence among narcotic abusers. International Journal of the Addictions 4(1): 45-57 (1969)

For abstract, see Section VIII. Psychosocial Studies.

CHAMBERS, C.D., BABST, D.V. and WARNER, A. Characteristics predicting long-term retention in a methadone maintenance program. Proceedings of the Third National Conference on Methadone Treatment, National Institute of Mental Health, Rockville Maryland, November 14-16, 1970. Pp. 140-143.

For abstract, see Section VII. Treatment-Related Research.

CHAMBERS, C.D. and BALL, J.C. Suicide among hospitalized opiate addicts. The Epidemiology of Opiate Addiction in the United States. Edited by J.C. Ball and C.D. Chambers. Springfield, Illinois: Charles C. Thomas, 1970.

For abstract, see Section VIII. Psychosocial Studies.

CHAMBERS, C.D., BRIDGE, T.P., PETERSEN, D.M. and ELLINWOOD, E.H., JR. Methaqualone: Another "safe" sedative? Journal of Drug Issues 4(2): 126-129 (Spring, 1974)

For abstract, see Section VIII. Psychosocial Studies.

CHAMBERS, C.D., CUSKEY, W.R. and MOFFETT, A.D. Mexican-American addicts. The Epidemiology of Opiate Addiction in the United States. Edited by J.C. Ball amd C.D. Chambers. Springfield, Illinois: Charles C. Thomas, 1970. Pp. 202-221.

An empirical study of the Mexican-American opiate addict is reported. This group is the fourth largest contributer to the addict population in the U.S. Social characteristics, characteristics associated with addiction and related deviancies, and hospital admission characteristics were examined. Statistics are provided which compare this group with other ethnic and cultural groups.

CHAMBERS, C.D., HINESLEY, R.K. and MOLDESTAD, M. The female opiate addict. The Epidemiology of Opiate Addiction in the United States. Edited by J.C. Ball and C.D. Chambers. Springfield, Illinois: Charles C. Thomas, 1970.

For abstract, see Section VIII. Psychosocial Studies.

CHAMBERS, C.D. and INCIARDI, J.A. An empirical assessment of the availability of illicit methadone. Proceedings of the Fourth National Conference on Methadone Treatment. New York: NAPAN, 1972. Pp. 149-151.

Results of an empirical assessment conducted to determine the availability of illicit methadone on the street were given. A series of questions were directed at 95 street addicts dealing with the availability, the actual purchase, the identification of the source and the uses of illicitly purchased methadone. Of the 95 active heroin addicts, 92 percent reported that they had been offered the opportunity to purchase illicit methadone, while 56 percent had actually purchased illicit methadone. The most readily available methadone was the wafer which sold for the average price of $4.00 per 40mg wafer. Not unexpectedly, the reported source of most of the illicit methadone was from ambulatory patients enrolled in programs dispensing takehome medication. The most frequently specified primary uses were to insure against withdrawal distress, to boost other drugs, to clean up, and to resell. The data indicates a need for further investigations into: (1) the programs responsible for the diversion of methadone; (2) the differential rates of diversion from programs utilizing the various types of methadone; (3) the motivation and rationale for both selling and purchasing illicit methadone; (4) how one learns about methadone; and (5) when in an active addict's career he is most susceptible to buying illicit methadone.

CHAMBERS, C.D. and MOFFETT, A.D. Negro opiate addiction. The Epidemiology of Opiate Addiction in the United States. Edited by J.C. Ball and C.D. Chambers. Springfield, Illinois: Charles C. Thomas, 1970.

For abstract, see Section VIII. Psychosocial Studies.

CHAMBERS, C.D. and MOLDESTAD, M. The evolution of concurrent opiate and sedative addictions. The Epidemiology of Opiate Addiction in the United States. Edited by J.C. Ball and C.D. Chambers. Springfield, Illinois: Charles C. Thomas, 1970. Pp. 130-146.

It is indicated that sedative abuse and addiction among opiate users may not significantly increase beyond the 1966 level. The relative stability of the white pattern of abuse and addiction to these drugs since 1957 supports such a hypothesis. The homogenizing effect of the standard metropolitan statistical area (SMSA) illicit drug subculture, wherein both races tend to from the same illicit sources, and tend to administer the drugs in the same manner and setting, would also support such a hypothesis.

CHAMBERS, C.D., SHERIDAN, B.K. and WILLIS, T. Diffusion paths for a drug of abuse. Drug Abuse: Current Concepts and Research. Edited by W. Keup. Springfield, Illinois: Charles C. Thomas, 1972.

For abstract, see Section VIII. Psychosocial Studies.

CHAMBERS, C.D., TAYLOR, W.J. and MOFFETT, A.D. The incidence of cocaine abuse among methadone maintenance patients. International Journal of the Addictions 7(3): 427-441 (Fall, 1972)

For abstract, see Section VII. Treatment-Related Research.

CHAPEL, J.L. and TAYLOR, D.W. Drugs for kicks. Crime and Delinquency 16(1): 1-35 (1970)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

CHERUBIN, C.E., BADEN, M., KAVALER, F., LERNER, S. and CLINE, W. Infective endocarditis in narcotic addicts. Annals of Internal Medicine 69(6): 1091-1098 (1968)

A study of endocarditis in 29 hospitalized and 7 nonhospitalized narcotic addicts showed sole tricuspid valve involvement in 9 percent and bilateral endocarditis involving the tricuspid valve in another 9 percent. The most commonly affected valves were the aortic and the mitral, in that order. Of the hospitalized patients, 48 percnet had staphylococci, 14 percent had streptococci, 3 patients had candida, and the rest had either gram negative or no organisms. A history of unde lying heart disease was less frequent in the addicts than in age matched controls. Major embolic episodes were common, particularly in patients with aortic involvement. Seven patients died suddenly, out of the hospital, with cerebral or myocardial emboli. Although there appears to be no increased frequency of tricuspid and candid endocarditis in addicts as compared to controls, the literature overreports these unusual cases of endocarditis in addicts.

CROWLEY, T.J., CHESLUK, D., DILTS, S. and HART, R. Drug and alcohol abuse among psychiatric admissions. Archives of General Psychiatry 30: 13-20 (January, 1974)

Over one third of the adults in a psychiatric hospital had drug abuse including alcohol) problems. The patients had fewer psychotic diagnoses, briefer hospitalizations, and less elevated Minnesota Multiphasic Personality Inventory scores than other inpatients. Toxicologic examinations, at admission, revealed psychoactive drugs in nearly half of the patients; many test results were positive for drugs that the patients denied using.

Alcohol or sedative physical dependence was not uncommon. Alcohol contributed to one fourth of the admissions, but many patients also took other drugs. Younger and older patients drank alcohol in equal proportions.

There was no current, and very little past, narcotic physical dependence, but one fifth of patients had abused narcotics. Nonaddicting narcotic abuse was especially common among young psychedelic users. Salicylates were abused frequently. The high incidence and complex pattenrs of drug abuse among psychiatric inpatients demand better diagnosis, more focused treatment, and altered public and private funding policies.

CRUMPTON, E. and BRILL, N.Q. Personality factors associated with frequency of marijuana use. California Medicine 115(3): 11-15 (September, 1971)

For abstract, see Section VIII. Psychosocial Studies.

CUSHMAN, P. Hyperimmunoglobulinemia in heroin addiction: Some epidemiologic observations, including some possible effects of route of administration and multiple drug abuse. American Journal of Epidemiology 99(3): 218-224 (1974)

Epidemiologic and clinical features of hyperimmunoglobulinemia in heroin addiction were studied in 250 New York City, 131 Washington, D.C., 36 Tucson and 7 Honolulu heroin addicts. The frequency with which increased serum lgG levels was found was similar in all groups studied. Increased serum IgM was found in about 75% of the New York addicts, 41% of the Washington, D.C. addicts; 25% of the Tucson addicts; and 57% of the Honolulu addicts. Demographic and clinical differences between the groups may be contributed to the different frequencies of increased serum lgM. The route of heroin administration was significant since patients who seemed to have used only intranasal heroin had generally normal serum lgM levels. Concomitant use of barbiturates, cocaine and amphetamines, when recognized, did not appear to be a factor in hyperimmunoglobulinemia. Since the diluents used in the eastern seaboard cities differed significantly from those in use in Arizona, the finding of hyperimmunoglobulinemia in both regions makes its unlikely that the diluents were a significant factor. Reduction in serum lgM abnormality was associated with methadone maintenance treatment in some patients.

CUSHMAN, P., JR. Methadone maintenance treatment of narcotic addiction. New York State Journal of Medicine 72(13): 1752-1755 (July 1, 1972)

For abstract, see Section VIII. Psychosocial Studies.

CUSHMAN, P. Narcotic addiction and crime. Rhode Island Medical Journal 57: 197-204 (May, 1974)

Criminal behavior of 269 narcotic addicted individuals, reflected by their New York City police arrest records, were studied longitudinally in relation to various stages of narcotic use. Predominantly non-criminal before addiction, the patients had progressively increased rates of annual arrests after addiction started. Increased arrests were primarily for violations of the dangerous drug laws, prostitution, violence, property crime, and misbehavior. During methadone maintenance treatment the frequencies of dangerous drugs, prostitution, and property type of arrests fell steeply, approaching their incidences in the control propulation, while misbehavior and violence remained somewhat higher than controls. This study documents a complex interrelationship between addiction and crime in a lower class, predominantly minority group of urban addicts.

CUSHMAN, P., JR. Relationship between narcotic addiction and crime. Federal Probation 38: 38-42 (September, 1974)

For abstract, see Section VIII. Psychosocial Studies.

CUSHMAN, P., JR. and SHERMAN, C. Biologic false-positive reactions in serologic tests for syphilis in narcotic addiction. American Journal of Clinical Pathology 61(3): 346-351 (March, 1974)

For abstract, see Section V. Adverse Effects, Toxicity and Genetic Effects.

DeFOREST, J.W. and HAYS, J.R. Drugs: How much do parents know? St. Joseph Hospital Medical Surgical Journal 9(1): 7-11 (March, 1974)

For abstract, see Section VIII. Psychosocial Studies.

DeLEON, G. Phoenix House: Psychopathological signs among male and female drug-free residents. Addictive Diseases: An International Journal 1(2): 135-151 (1974)

For abstract, see Section VIII. Psychosocial Studies.

DeLEON, G., HOLLAND, S. and RESENTHAL, M.S. Phoenix House: Criminal activity of dropouts. Journal of the American Medical Association 222(6): 686-689 (November, 1972)

For abstract, see Section VII. Treatment-Related Research.

DuTOIT, B.M. Cannabis sativa in sub-Saharan Africa. South African Journal of Science 70(9) (1974)

EICHBERG, R.H. and BENTLER, P.M. Current issues in the epidemiology of drug abuse as related to psychosocial studies of adolescent drug use. Presented at the National Institute on Drug Abuse Drug Lifestyles Conference, St. Simons, Georgia, January, 1975.

For abstract, see Section I. Methodology of Drug Research.

ELLINWOOD, E.H., JR. Cultural disparity between generations and drug use. Drug Addiction: Clinical and Socio-Legal Aspects, Vol II. Edited by J.M. Singh. Mount Kisco, New York: Futura Publishing Company, Inc., 1972. Pp. 97-105.

FELDMAN, H.W. Street Status and the Drug Researcher: Issues in Participant-Observation. Washington, D.C.: The Drug Abuse Council, Inc., 1974.

FELDMAN, H.W. The street system, drugs, and the military service. Confronting Drug Abuse. Edited by A.A. Sorensen. Philadelphia, Pennsylvania: Pilgrim Press, 1972. Pp. 61-77.

FELDSTEIN, S., CHESTER, P. and FINK, M. Psychological differentiation and the response of opiate addicts to pharmacological treatment. British Journal of the Addictions 68: 151-157 (1973)

For abstract, see Section VIII. Psychosocial Studies.

FINK, M. EEG and human psychopharmacology. Annual Review of Pharmacology 9: 241-258 (1969)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

GOLDSTEIN, J.W. Getting high in high school: The meaning of adolescent drug usage. Presented at Students and Drugs Symposium, Annual Meeting of the American Educational Research Association, New York, New York, February 7, 1971.

For abstract, see Section VIII. Psychosocial Studies.

GOLDSTEIN, J.W. Narcotics and Alcoholism. Hearing before the Subcommittee on Alcoholism and Narcotics of the Committee on Labor and Public Welfare, United States Senate, Pittsburgh, Pennsylvania, January 18-19, 1971. Washington, D.C.: U.S. Government Printing Office, 1971.

GOLDSTEIN, J.W. and GLEASON, T.C. Significance of increasing student marijuana use for intended use of other drugs. Proceedings of the 81st Annual Convention of the American Psychiatric Association, 1973. Pp. 305-306.

GOLDSTEIN, J.W., GLEASON, T.C. and KORN, J.H. Whither the epidemic? Psychoactive drug use career patterns of college students. Journal of Applied Social Psychology (in press)

For abstract, see Section VIII. Psychosocial Studies.

GOODE, E. The marijuana market. Columbia Forum 12(4): 4-8 (Winter, 1969)

GOODE, E. Multiple drug use among marijuana smokers. Social Problems 17: 48-64 (Summer, 1969)

GOODWIN, D.W., DAVIS, D.H. and ROBINS, L.N. Drinking amid abundant illicit drugs: The Viet Nam case. Archives of General Psychiatry (in press)

GOTTSCHALK, L.A., McGUIRE, F.L., HEISER, J.F. and ALEXANDER, P.B. The Development of a Uniform System for Reporting and Recording Drug-Related Deaths. Orange, California: Research and Education Foundation of Orange County Medical Center, Psychiatry Department, 1973.

GRUPP, S.E. The Marihuana Muddle. Lexington, Massachusetts: D.C. Heath and Company, 1973.

HAYS, J.R. The incidence and correlates of drug abuse in the secondary schools of the Houston Independent School District. A Technical Report to the Drug Education Committee of the Board of Education of the Houston Independent School District, November, 1971.

For abstract, see Section VI. Drug Use/Abuse Prevention.

HAYS, J.R. The incidence of drug abuse among secondary school students in Houston. St. Joseph Hospital Medical Surgical Journal 6(1): 52-59 (Spring, 1971)

The aim of the survey was to define the extent of drug use among secondary school students, the demographic, factual and attitudinal variables which covaried with drug use. Additionally the students were asked what they felt would be the best response of the school system and public service agencies to drug abuse education and treatment. The survey was designed to provide relevant information on four points. It would provide the baseline data necessary to detect changes in the pattern of drug abuse. Secondly, it would help focus and modify the drug education program which are required by statute in the State of Texas in grades 5 through 12. It would aid public service agencies in planning programs in drug abuse. It would provide da for public education so that the general public can be aware of the extent of the problems in Houston.

HAYS, J.R. The incidence of drug abuse among secondary school students in Houston, 1971. St. Joseph Hospital Medical Surgical Journal 7(4) 146-152 (Fall, 1972)

As a result of the second survey in HISD, we now have an index of the change in the patterns of drug use among secondary school students. We have also obtained validation of the correlates of drug use when comparing the 1970 with the 1971 data. This is the first opportunity we have had for examining the changes in patterns of drug use and should allow us to begin making predictions about future changes. Modification on our drug education programs and programs for treatment should be based on the data we have obtained. Further analysis of the data will provide information for changes in our drug education programs and drug abuse treatment programs. Further studies should be conducted of changes in the patterns of the use of drugs. In such future studies the only information which should be required is the incidence information. It does not appear that the correlates of use have changed significantly from 1970 to 1971. However this should be examined periodically also. It would be advisable to check the correlates of use perhaps every fourth or fifth year rather than obtaining the data annually.

HAYS, J.R. The incidence of drug abuse among secondary school students in Houston, 1973. St. Joseph Hospital Medical Surgical Journal 9(1): 12-17 (March, 1974)

As a result of the third survey in HISD, we now have an index of the change in the patterns of drug use among secondary shcool students. We have also obtained validation of the correlates of drug use by comparing the three years of data. This is the first opportunity we have had for examining the change in patterns of drug use and it should allow us to begin making predictions about future changes. It is evident from these data that Houston has not yet reached any peak or plateau for most of the drugs of abuse. Modification of our drug education programs and programs for treatment should be based on the data we have obtained. Further analysis of the data will provide information for changes in our drug education programs and drug abuse treatment programs. Further studies should be conducted of changes in the patterns of the use of drugs. It does not appear that the correlates of use have changed significantly during the three years of study. However, the correlates should be examined periodically.

HAYS, J.R. and WINBURN, G.M. Drug abuse among elementary school students in a suburban school setting. Journal of Drug Education 2(4): 355-360 (Winter, 1972)

Review of a study concerning drug abuse, conducted at the elementary school level. Study investigated the extend and nature of drug abuse among children of this age. Paper describes sample, instrument, and procedure of methods used, and results. Discussion provides summary of findings.

HAYS, J.R., WINBURN, G.M. and BLOOM, R. Marijuana and the law: What young people say. Journal of Drug Education (in press)

HOCHMAN, J.S. and BRILL, N.Q. Chronic marijuana use and psychosocial adaptation. American Journal of Psychiatry 130(2): 132-140 (February, 1973)

For abstract, see Section IV. Behavioral Studies.

HUGHES, P.H., BARKER, N.W., CRAWFORD, G.A. and JAFFE, J.H. The natural history of a heroin epidemic. American Journal of Public Health 62(7): 995-1001 (July, 1972)

For abstract, see Section VIII. Psychosocial Studies.

HUGHES, P.H., CRAWFORD, G.A. and BARKER, N.W. Developing an epidemiologic field team for drug dependence. Archives of General Psychiatry 24(5): 389-393 (May, 1971)

For abstract, see Section VII. Treatment-Related Research.

HUGHES, P.H., CRAWFORD, G.A., BARKER, N.W., SCHUMANN, S. and JAFFE, J.H. The social structure of a heroin copping community. American Journal of Psychiatry 128(5): 551-557 (November, 1971)

For abstract, see Section VII. Treatment-Related Research.

HUGHES, P.H. and JAFFE, J.H. The heroin copping area. A location for epidemiological study and intervention activity. Archives of General Psychiatry 24(5): 394-400 (May, 1971)

For abstract, see Section VII. Treatment-Related Research.

INCIARDI, J.A. and CHAMBERS, C.D. Patterns of pentazocine abuse. Drug Abuse: Current Concepts and Research. Edited by W. Keup. Springfield, Illinois: Charles C. Thomas, 1972.

For abstract, see Section III. Mechanisms of Action of Different Drugs.

INCIARDI, J.A. and CHAMBERS, C.D. Unreported criminal involvement of narcotic addicts. Journal of Drug Issues 2(2): 57-64 (Spring, 1972)

In an attempt to mitigate the problem of collecting empirical data with respect to narcotic addiction and drug abuse, the New York State Narcotic Addiction Control Commission initiated a series of special projects designed to accumulate more comprehensive data relative to drug-using and drug-seeking behaviors. This preliminary report of the self-reported crime of narcotic addicts evolved for the purpose of refining methods for the collection of hidden offense data, for assessing the extend of addict-crime, and for constructing and analyzing criminal career patterns. The results indicated that 6,766 alleged offenses were committed by 38 male addicts over a median period of 4 years, and 6,425 alleged offenses were committed by 32 female addicts over a median period of 3 years. Furthermore, the data suggested that only 1 crime was cleared by arrest for every 120 offenses committed. Though there are limitations circumscribing the findings, the data do indicate that crime rates among specific populations may indeed be many hundredfold higher than are realized.

JOE, G.W. Patient background indices for a drug-abusing population - development and distribution characteristics of a set of patient background index measures, based on the DARP population admitted to treatment between June 1969 and June 1971. Research on Patients, Treatments, and Outcomes. Edited by S.B. Sells. Studies on the Effectiveness of Treatments for Drug Abuse, Vol. 2. Cambridge, Massachusetts: Ballinger, 1974.

JOSEPHSON, E. Adolescent marijuana use, 1971-1972: Findings from two national surveys. Addictive Diseases: An International Journal 1(10): 55-72 (1974)

JOSEPHSON, E. Trends in adolescent marijuana use. Drug Use: Epidemiological and Sociological Approaches. Edited by E. Josephson and E.E. Carroll. New York: Hallstead Publishing Corporation, 1974. Pp. 177-205.

JOSEPHSON, E., HABERMAN, P., ZANES, A. and ELINSON, J. Adolescent marijuana use: Report on a national survey. Presented at the First International Conference on Student Drug Surveys, Newark, New Jersey, September 14, 1971.

The major finding from this survey is that one in seven (15%) of a national adolescent sample had tried marijuana, with 3% reporting frequent use (60 or more times). Another finding is that youngsters in the West were twice as likely to have tried the drug as their contemporaries in the South. Older boys and girls (those 16 and 17 years of age) were nearly ten times as likely to have used marijuana as the younger ones (12 and 13); frequent use was reported chiefly by the older youths. On the other hand, younger boys and girls were just as interested in trying the drug as the older ones, who may be using as much as they want to. Surprisingly, girls reported almost as much marijuana use as did boys. In comparison with nonusers, occasional and frequent users of the drug were not only concentrated in the West and East and among those 16 and 17 years of age, they were also more likely to be found in metropolitan areas and in families with above average income. Occasional and frequent users of marijuana were also considerably more likely to have experimented with a number of other mood-changing drugs.

KANDEL, D. Adolescent marihuana use: Role of parents and peers. Science 181: 1067-1070 (September, 1973)

For abstract, see Section VIII. Psychosocial Studies.

KANDEL, D. Inter- and intragenerational influences on adolescent marijuana use. Journal of Social Issues 30(2): 107-135 (1974)

For abstract, see Section VIII. Psychosocial Studies.

KANDEL, D. Interpersonal influences on adolescent illegal drug use. Drug Use: Epidemiological and Sociological Approaches. Edited by E. Josephson and E.E. Carroll. New York: Hallstead Publishing Corporation, 1974.

KANDEL, D. Reaching the hard-to-reach: Illicit drug use among high school absentees. Addictive Diseases: An International Journal (in press, 1975)

For abstract, see Section I. Methodology of Drug Research.

KANDEL, D. Some comments on the relationship of selected criteria variables to adolescent drug use. Presented at the National Institute on Drug Abuse Drug Life-styles Conference, St. Simons Island, Georgia, January, 1975.

KORN, J.H. and GOLDSTEIN, J.W. Psychoactive drugs: A course evaluation. Journal of Drug Education 3(4): 353-368 (Winter, 1973)

For abstract, see Section VIII. Psychosocial Studies.

McBRIDE, D.C., WEPPNER, R.S. and McCOY, C.B. A comparison of Spanish and non-Spanish drug users in treatment in Dade County, Florida. The Spanish Drug User: Issues and Perspectives (in press)

McRAE, D.J. Development of a patient topology. Research on Patients, Treatments, and Outcomes. Edited by S.B. Sells. Studies of the Effectiveness of Treatments for Drug Abuse, Vol. 2. Cambridge, Massachusetts: Ballinger, 1974.

MANHEIMER, D.I. and MELLINGER, G.D. Marijuana use among urban adults. Science 166: 1544-1545 (December, 1969)

For abstract, see Section VIII. Psychosocial Studies.

MECHANECK, R., FELDSTEIN, S., DAHLBERG, C.C. and JAFFE, J. Experimental investigation of LSD as a psychotherapeutic adjunct. Comprehensive Psychiatry 9(5): 490-498 (September, 1968)

MELLINGER, G.D. The psychotherapeutic drug scene in San Francisco. Drug Abuse: Data and Debate. Edited by P.H. Blachly. Springfield, Illinois: Charles C. Thomas, 1970. Pp. 226-240.

For abstract, see Section VIII. Psychosocial Studies.

MELLINGER, G.D., BALTER, M.B. and MANHEIMER, D.I. Patterns of psychotherapeutic drug use among adults in San Francisco. Archives of General Psychiatry 25: 383-394 (November, 1971)

For abstract, see Section VIII. Psychosocial Studies.

MIRIN, S.M., SHAPIRO, D.M., MEYER, R.E., PILLARD, R.C. and FISHER, S. Casual versus heavy use of marijuana: A redefinition of the marijuana problem. American Journal of Psychiatry 127: 1134-1140 (March, 1971)

For abstract, see Section VIII. Psychosocial Studies.

PARRY, H.J., BALTER, M.B. and CISIN, I.H. Primary levels of under-reporting psychotropic drug use. Public Opinion Quarterly 34: 582-592 (Winter, 1970-1971)

The present article reports on a methodological problem: The extent to which use of psychotropes is under-reported by various population subgroups and under various techniques of questioning. Comparative findings for antibiotic use are also reported.

PARRY, H.J., BALTER, M.B., MELLINGER, G.D., CISIN, I.H. and MANHEIMER, D.I. National patterns of psychotherapeutic drug use. Archives of General Psychiatry 28: 769 (June, 1973)

For abstract, see Section VIII. Psychosocial Studies.

PEARLMAN, S., PHILIP, A.F., ROBBINS, L., ROBBINS, E.S., ROBINSON, E. and SCHMITTER, B. The college drug scene: Adventures in epidemiological research. Presented in the Symposium: Students and Drugs, 55th Annual Convention of the American Educational Research Association, New York City, New York, February 7, 1971.

PEARLMAN, S., PHILIP, A.F., ROBBINS, L.C., ROBBINS, E.S., ROBINSON, E.E. and SCHMITTER, B. Religious affiliations and patterns of drug usage in an urban university population. Proceedings of the First International Conference on Student Drug Surveys, September 12-15, 1972, Newark, N.J. Edited by S. Einstein and S. Allen. Farmingdale, New York: Baywood Publishing Company, 1972. Pp. 139-186.

PEARLMAN, S., ROBBINS, E., ROBINSON, E., ROBBINS, L., PHILIP, A. and SCHMITTER, B. Myths and realities of the college drug scene: Adventures in epidemiology. Management of Adolescent Drug Misuse: Clinical, Psychological and Legal Perspectives. Edited by J.R. Gamage. Madison, Wisconsin: STASH Press, 1973. Pp. 1-13.

PILLARD, R.C. Marijuana is not a public health menance: It is time to relax our social policy Controversy in Internal Medicine II. Edited by F.J. Ingelfinger, M. Finland, A. Relman and R. Elbert. Philadelphia, Pennsynvania: W.B. Saunders and Company, 1974.

PILLARD, R.C. Medical progress. Marihuana. New England Journal of Medicine 283: 294-303 (August, 1970)

RICHMAN, A. Peak year of onset of heroin use: Epidemiologic fact or mystic statistic. Presented at the First National Drug Abuse Conference, Chicago, Illinois, March 30-April 2, 1974.

The "peak year" of onset of heroin use among admissions is a misleading index; it does not demonstrate changes in the incidence of narcotic dependency in the community. Rather, as the distribution of intervals between onset and admission, it demonstrates the effects of threshold affecting factors - the balance between need for treatment and admission. The threshold for admission is affected by a large number of factors in addition to incidence in the community. "Peaks" in the distribution of year of onset of heroin use of time do not (and cannot) show that there were peak years of onset in the community. The "peaks" of onset years among admissions have been shown to be produced, not by epidemic outbreaks, but by the summation of data from diverse sources.

The major, rapid decrease in first admissions to the Narcotic Treatment Agency in 1972, which also occurred for readmissions, and which was more marked with voluntary admissions than criminal justice admissions, represents changes in the utilization of treatment or attitudes toward admission in the District of Columbia. Such differences in the utilization of services are evident in the Haight Ashbury Free Medical Clinic where Newmeyer has described marked changes in characteristics of patients. Admissions whose addiction began in 1969 or later were, in comparison to patients with earlier onsets, more likely to be white, female, to have had widespread use of other substances before their heroin addiction and to have become addicted at a later age. These changes represent the kinds of patients being admitted from the community whose drug abuse requires some form of clinical or social intervention provided by the clinic, rather than changes in incidence.

We do not yet have methods for monitoring changes in the extent of narcotic dependency in the community and, as yet, correlation of data from diverse sources cannot substitute for direct surveys of incidence and prevalence. Epidemiologic research has no adequate substitute for valid data or reliable methods. Estimates of incidence of narcotic addiction which are based on faulty assumptions, understated premises, unsubstantiated multipliers or erroneous interpretations of statistical or epidemiologic data are useless.

RICHMAN, A. and RICHMAN, V.V. Epidemiologic assessment of changes in the onset of narcotic addiction. Committee on Problems of Drug Dependence, Washington, D.C.: National Academy of Sciences, National Research Council, 1974. Pp. 669-690

We have assessed the evidence for claims of decreased incidence of narcotic dependency in the community. The existing evidence does not yet support such claims of decreased incidence.

This paper has demonstrated the hazards of assessing "peak" years of onset from percentage distributions; identified the type of statistical distribution followed by ascertainment intervals; emphasized that incidence cannot be assessed from admission data alone; and described the range of social, biological and intrapsychic variables involved in the complex process leading up to entry into treatment.

Delays in entering treatment are discussed in terms of street alternatives to treatment of narcotic dependency; the role of compulsion and multiple substance use.

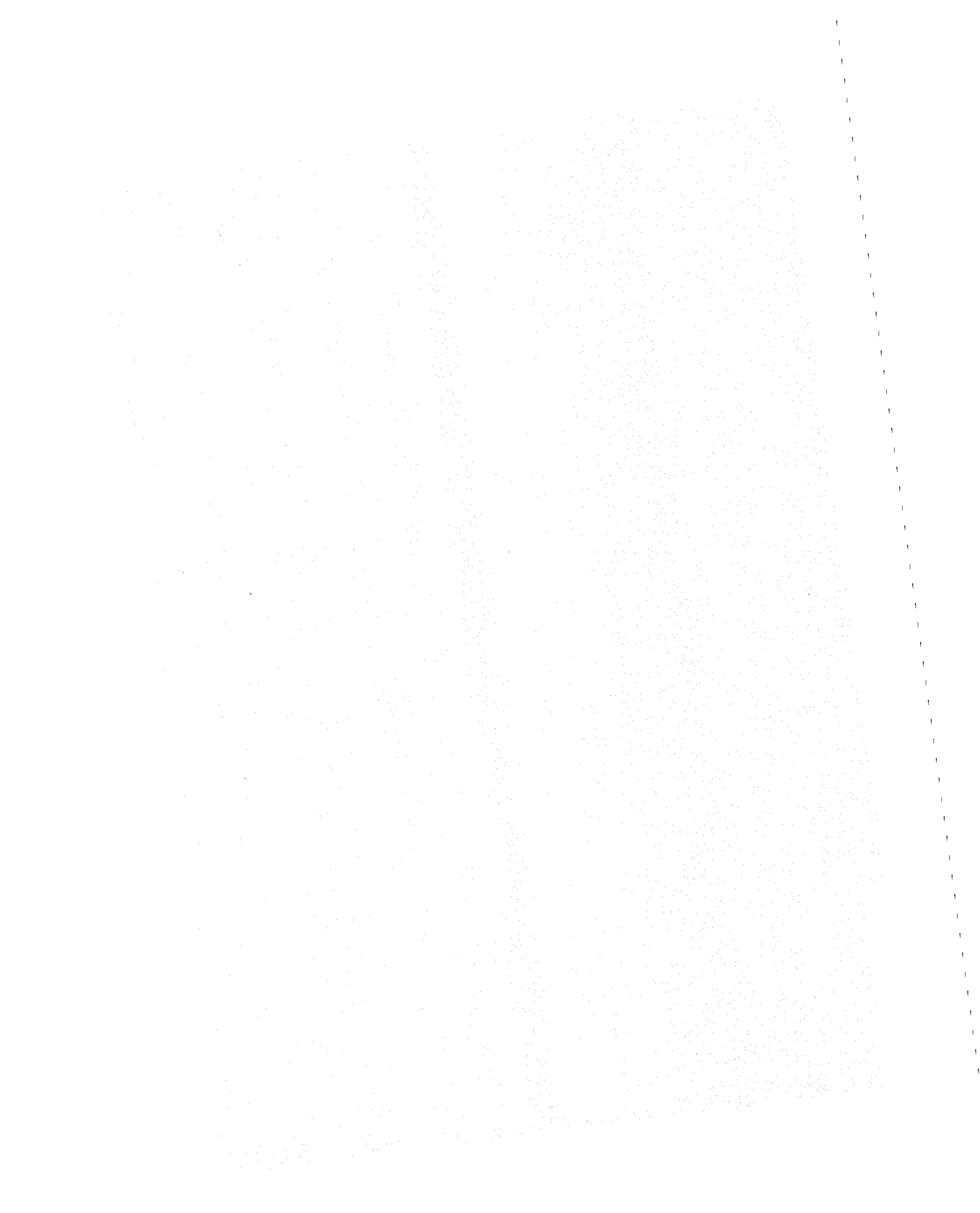
Additional epidemiologic research is required to assess trends in prevalence, incidence, duration, distribution and outcome of narcotic abuse.

RICHMAN, A. and RICHMAN, V.V. National estimates of the prevalence of narcotic addiction. Presented at the First National Drug Abuse Conference, Chicago, Illinois, March 30-April 2, 1974.

There is no substitute for valid data or reliable methods in epidemiologic research. Estimates of the prevalence of narcotic addiction which are based on faulty assumptions, unstated premises, or unsubstantiated multipliers are useless. The natural history of narcotic addiction, the validity of source data, and the highly specific demographic and spatial distributions of narcotic addiction must be considered in assessing prevalence.

A log normal distribution has been identified for the prevalence of narcotic addiction in sub-regions of New York City and Baltimore. This log normal distribution is of major importance for analyzing the dynamics of spatial spread of diffusion.

In addition to considering trends in incidence, changes in the geometric dispersion of the distribution of prevalence by place would reflect the state of growth or spread of epidemic disorders.



RICHTER, R.W. and BADEN, M.M. Neurological complications of heroin addiction. Transactions of the American Neurological Assocation 94: 330-332 (1969)

The epidemiology of heroin addiction in Harlem, New York City, is discussed. Harlem Hospital serves the central Harlem area, which has a population of more than 300,000. Many complications of heroin addiction are treated there. Neurological syndromes observed there and discussed in this article include: acute transverse myelitis of thoracic segments; peripheral nerve lesions; polyneuritis; acute and chronic brain disorders, including fulminating infections; and tetanus. Brain findings at autopsy are summarized.

ROBBINS, L., ROBBINS, E., PEARLMAN, S., PHILIP, A., ROBINSON, E. and SCHMITTER, B. College students' opinions of various aspects of drug use: A comparison of users and nonusers. Proceedings of the 78th Annual Convention of the American Psychiatric Association, 1970.

ROBBINS, L., ROBBINS, E., PEARLMAN, S., PHILIP, A., ROBINSON, E. and SCHMITTER, B. College students' perceptions of their parents' attitudes and practices toward drug use. Journal of Alcohol and Drug Education 18(2): 6-12 (Winter, 1973)

Students at twenty colleges in the New York area were asked about their parents' attitudes and practices regarding drug use. Reported parental use and willingness to tolerate experimentation with drugs were more likely to be perceived as parental characteristics by students using marijuana or other illicit drugs than by students who never used illicit drugs or who stopped using them. The present data suggest that parental practices and attitudes play a major role in the decision of many student to become involved with drugs, as well as their selection of substances.

ROBINS, L.N. A follow-up study of Vietnam veterans' drug use. Journal of Drug Issues 4(1): 61-63 (Winter, 1974)

The results of this study indicate that dependence on narcotics is not so permanent as we had once believed, at least among young healthy men whose period of addiction was less than one year. Not only did many of the addicted stop their drug use without any special treatment at the time they left Vietnam but many of those who continued use have not been readdicted. Although addiction to heroin has not been nearly so common as one might have anticipated on the basis of the high rates of addiction in Vietnam, there has been enough shift to other drugs, particularly by those who were addicted to narcotics, to be of concern. We hope to re-study these men when they have been back from Vietnam for three years to learn their long-term prognosis and drug use patterns.

ROBINS, L.N. Getting epidemiological data for policy planning: Explanations for design decisions in the Vietnam follow-up. Proceedings of the CENTO Seminar on The Epidemiology of Non-Medical Drug Use, Izmir, Turkey, October, 1974 (in press)

ROBINS, L.N. The Vietnam Drug User Returns. Final report submitted to the Special Action Office for Drug Abuse Prevention. Special Action Office Monograph, Series A, Number 2, May, 1974. Washington, D.C.: U.S. Government Printing Officer, 1974.

ROBINS, L.N., DAVIS, D.H. and GOODWIN, D.W. Drug use by U.S. army enlisted men in Vietnam: A follow-up on their return home. American Journal of Epidemiology 99(4): 235-249 (1974)

Between May and September 1972, 943 men who had returned to the United States from Vietnam in September 1971 as Army enlisted men were sought for interview and collection of urine specimens. Of these men, 470 represented the general population of Army enlisted men returning at that time; 495 represented those whose urines had been positive for opiates at time of departure from Vietnam. At interview 8-12 months after their return, 83% were civilians and 17% still in service. Nine hundred were personally interviewed and urine specimens collected for 876. Almost half of the "general" sample tried heroin or opium while in Vietnam and one-fifth developed physical or psychological dependence. In the 8- to 12-month period since their return, about 10% had some experience with opiates, but less than 1% had shown signs of opiate dependence. In the "drug positive" sample, three-quarters felt they had been addicted to narcotics in Vietnam. After return, one-third had some experience with opiates, but only 7% showed signs of dependence. Rather than giving up drugs altogether, many had shifted from heroin to amphetamines or barbiturates. Nevertheless, almost none expressed a desire for treatment. Pre-service use of drugs and extent of use in Vietnam were the strongest predictors of continued use after Vietnam. The results indicate that, contrary to conventional belief, the occasional use of narcotics without becoming addicted appears possible even for men who have previously been dependent on narcotics.

ROBINS, L.N., DAVIS, D.H. and NURCO, D.N. How permanent was Vietnam drug addiction? American Journal of Public Health 64(Supplement): 38-43 (December, 1974)

In 1971, drug use by U.S. servicemen in Vietnam had, by all estimates, reached epidemic proportions. A follow-up study of returning Army enlisted men was carried out in order to facilitate planning of programs for these soldiers and to gain insight concerning the natural history of drug use and abuse when drugs are readily available to young men from all types of social backgrounds. Findings on the permanence of Vietnam drug addiction are presented.

ROSENBERG, J.S., KASL, S.V. and BERBERIAN, R.M. Sex differences in adolescent drug use: Recent trends. Addictive Diseases: An International Journal 1(10): 73-96 (1974)

Sex differences in preferred illicit drugs and trends in use over time were identified for large samples of junior and senior high school students. Current use and lifetime prevalence were anonymously reported by 2 comparable samples one year apart. Between survey years the number of females who "ever used" a drug increased significantly for 9 out of 11 drug categories while the number of males increased in only 3 categories.

SELLS, S.B. Research on Evaluation of Treatments for Drug Abuse Based on the NIMH-TCU Drug Abuse Reporting Program. Fort Worth, Texas: Texas Christian University, Institute of Behavioral Research, 1973.

SHICK, J.F., SMITH. D.E. and MEYERS, F.H. Patterns of drug use in the Haight-Ashbury neighborhood. Clinical Toxicology 3: 19-56 (1970)

SHICK, J.F., SMITH, D.E. and MEYERS, F.H. The use of amphetamines in the Haight-Ashbury subculture. Journal of Psychedelic Drugs 2: 63-76 (1969)

SHICK, F., SMITH, D.E. and MEYERS, F.H. Use of marijuana in the Haight-Ashbury subculture. Journal of Psychedelic Drugs 1: 49-66 (Fall, 1968)

SILVERMAN, I. On the methodology of student drug use surveys: From an epidemiologic to a cybernetic model. Proceedings of the First International Conference on Student Drug Surveys, September 12-15, 1971, Newark, New Jersey. Edited by S. Einstein and S. Allen. Farmingdale, New York: Baywood Publishing Company, 1972. Pp. 195-198.

SIMPSON, D.D. Use of alcohol by DARP patients in treatment for drug abuse: 1969-1971 admissions. Research on Patients, Treatments, and Outcomes. Edited by S.B. Sells. Studies of the Effectiveness of Treatments for Drug Abuse, Vol. 2. Cambridge, Massachusetts: Ballinger, 1974.

SIMPSON, D.D. and SELLS, S.B. Patterns of multiple drug abuse: 1969-1971. International Journal of the Addictions 9(2): 301-314 (1974)

For abstract, see Section I. Methodology of Drug Research.

SINGLE, E., KANDEL, D. and FAUST, R. Patterns of multiple drug use in high school. Journal of Health and Social Behavior (in press)

For abstract, see Section VIII. Psychosocial Studies.

SOMERS, R.H., MANHEIMER, D.I., KLEMAN, M.T. and MELLINGER, G.D. Earning the cooperation of students in surveys on sensitive topics. Social Science Methods: A New Introduction, Vol. 1. Edited by R.B. Smith. New York: The Free Press-Macmillan (in press)

Over 90 per cent of two large probability samples of male students at the University of California (Berkeley) were successfully interviewed during 1970-71. Much personal information was sought in interviews lasting a minimum of 1-1/2 hours and in many cases continuing for 2-1/2 hours or more. Areas of questioning included personal experience in the especially sensitive areas of political dissent and the use of drugs. Since the interviews were conducted at a time when gaining the cooperation of respondents for studies of this nature was very difficult, we believe it useful to discuss the procedures we followed that apparently helped us to obtain such a high level of cooperation.

Southern Regional Education Board. Why Evaluate Drug Education? Task Force Report. Atlanta, Georgia: Southern Regional Education Board, 1974.

SPIEGEL, D.K. DARP population description - a description of certain characteristics of the patients admitted to the joint NIMH-TCU Drug Abuse Reporting Program from June 1969 through November 1971. Research on Patients, Treatments, and Outcomes. Edited by S.B. Sells. Studies of the Effectiveness of Treatments for Drug Abuse, Vol. 2. Cambridge, Massachusetts: Ballinger, 1974.

STEFFENHAGEN, R.A. Motivation for drug and alcohol use: A social perspective. Paper for the Symposium Concerning Research on Methods and Programs of Drug Education, Toronto, Ontario, Canada, October 22-25, 1973.

STEFFENHAGEN, R.A., McAREE, C.P. and NIXON, H.L., II. Drug use among college females: Socio-demographic and social psychological correlates. International Journal of the Addictions 7(2): 285-303 (1972)

The purpose of this study was to determine whether socio-demographic and social psychological variables are related to college female drug use. A questionnaire was administered to 38 female drug users and 93 female nonusers. All the participants in this study were undergraduates at the University of Vermont. Of the 37 socio-demographic and social psychological variables tested by the chi square technique, statistically significant differences between drug users and nonusers at the 0.01 level were found for 10 of the variables. Drug users and nonusers were differentiated according to attitudes toward legalization of marijuana use and marijuana use as an enhancer of creativity; present religious affiliation; similarity of own religious affiliation and that of each parent; extent and nature of religious interest; initiation into alcohol use; previous use of cigarettes; frequency of current cigarette smoking; and initiation into cigarette smoking.

STEFFENHAGEN, R.A., McAREE, C.P. and PERSING, B.F. Socio-demographic variables associated with drug use at a New England college. International Journal of Social Psychiatry 17(4): 277-286 (Winter, 1971)

Of 37 variables checked for differences between the experimentals and controls, only 17 were significant at the .01 confidence level. Of the 17, 10 reflected socio-economic characteristics. On the basis of a Chi Square analysis it would appear that drug use is closely associated with S.E.S. factors. However, when the principal component analysis was applied to the data no apparent set of socio-demographic factors from our questionnaire is associated with illicit drug use. In conclusion, the analysis of our data suggests that extensive questionnaires dealing with socio-demographic variables are unproductive in explaining drug use.

STEFFENHAGEN, R.A., McAREE, C.P. and ZHEUTLIN, L.S. Social and academic factors associated with drug use on the University of Vermont campus. International Journal of Social Psychiatry 15: 92 (1969)

STEFFENHAGEN, R.A., McAREE, C.P. and ZHEUTLIN, L.S. Some social factors in college drug usage. International Journal of Social Psychiatry 15: 97 (1969)

A study of drug use among students at the University of Vermont was conducted during the school year 1967-1968. A questionnaire of both demographic and social data was administered to a group of admitted drug users along with a MMPI. The data in this article is restricted to a study of the demographic data. The experimental group was analyzed in an attempt to discern what factors might be associated with drug use. The following factors were significant:

1. A larger percentage of the admitted drug users were fraternity members than the general University population.
2. Family cohesion was significant, with only the Jewish group being high on cohesion.
3. Religion was also important in relationship to in-state and out-of-state. The Jewish were basically out-of-state while the Protestants and Catholics were in-state.
4. Religiosity and getting high the first time were related. Students who have strong religious conviction are less prone to get high the first time.
5. The variable of smoking alone is dependent upon the frequency of marijuana use.
6. The use of other hallucinogens (other than marijuana) is related to frequency of use.
7. Degree of social participation with drug users is related to frequency of marijuana smoking.
8. The use of other drugs is related to the frequency of marijuana smoking.

Student Association for the Study of Hallucinogens, Inc. MDA. STASH Capsules 5(1) (February, 1973)

Student Association for the Study of Hallucinogens, Inc. PMA. STASH Capsules 5(5) (October, 1973)

Student Association for the Study of Hallucinogens, Inc. STASH fact sheet on psilocybin. Grassroots (August, 1972 supplement)

Student Association for the Study of Hallucinogens, Inc. STASH notes: A mini-review of the 1973 marijuana literature, Part I. STASH Capsules 6(2) (March-April, 1974)

Student Association for the Study of Hallucinogens, Inc. STASH notes: A mini-review of the 1973 marijuana literature, Part II. STASH Capsules 6(3) (May-June, 1974)

Student Association for the Study of Hallucinogens, Inc. STASH notes: Phenyclidine (PCP). STASH Capsules 5(2) (April, 1973)

Student Association for the Study of Hallucinogens, Inc. STASH notes: Women and drugs. STASH Capsules 6(4) (August, 1974)

TART, C.T. On Being Stoned: A Psychological Study of Marijuana Intoxication. Palo Alto, California: Science and Behavior Books, 1971.

TAYLOR, W.J., CHAMBERS, C.D. and DEMBO, R. Cocaine abuse among methadone maintenance patients. Drug Abuse: Current Concepts and Research. Edited by W. Keup. Springfield, Illinois: Charles C. Thomas, 1972. Pp. 313-327.

For abstract, see Section VII. Treatment-Related Research.

UNGERLEIDER, J.T., COHEN, S., FORT, J., DITMAN, K.S. and FISHER, D.D. The prospects of LSD. The Problems and Prospects of LSD. Edited by J. Ungerleider. Springfield, Illinois: Charles C. Thomas, 1968. Pp. 80-91.

Five authors present their opinions on the prospects of lysergic acid diethylamide (LSD). Areas of discussion include: reactions among the professional and physician communities; types of users of LSD the future of LSD research; and possible beneficial effects of LSD.

The University of the State of New York. New York State Drug Administrators' Survey and Conference Report. Albany, New York: The University of the State of New York, 1971.

WATKINS, T.D. and CHAMBERS, C.D. Oxymorphone abuse among narcotic addicts. Drug Abuse: Current Concepts and Research. Edited by W. Keup. Springfield, Illinois Charles C. Thomas, 1972. Pp. 307-312.

Numorphan (oxymorphone), one of the newer semisynthetic narcotic analgesics, is currently being abused on a rather widespread scale, both as a preference drug and as a drug supplement to other narcotic habits. Although the prevalence of numorphan abuse was found to vary from a low of 2.9 percent to a high of 20.1 percent among various addict populations, it is primarily an abused drug among the white addicts, with their more ready access to legitimate drugs from physicians and pharmacists.

WECHSLER, H. and THUM, D. Drug use among teenagers: Patterns of present and anticipated use. International Journal of the Addictions 8(6): 909-920 (1973)

For abstract, see Section VIII. Psychosocial Studies.

WECHSLER, H. and THUM, D. The social context of drug abuse. New York Law Journal, Special Edition on Drugs (December 6, 1971)

WECHSLER, H. and THUM, D. Teen-age drinking, drug use, and social correlates. Quarterly Journal of Studies on Alcohol 34(4): 1220-1227 (December, 1973)

For abstract, see Section VIII. Psychosocial Studies.

WELLISCH, D. and HAYS, J.R. A cross-cultural study of the prevalence and correlates of student drug use in the United States and Mexico. Bulletin on Narcotics 26(1): 31-42 (January-March, 1974)

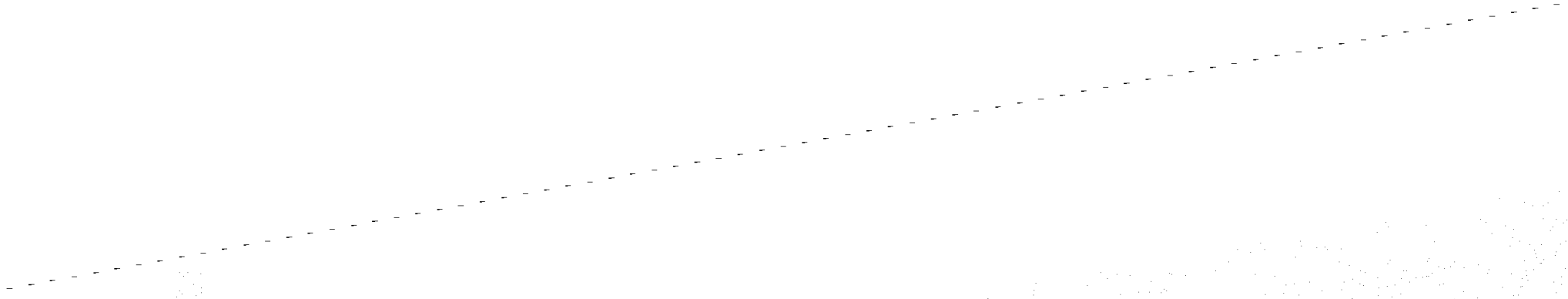
Many of the co-variates of drug use found in Houston are evident in the data generated in Monterrey. The prevalence for most drug use is lower in Monterrey, however. Future comparative studies need to be conducted to find how patterns of behaviour follow and develop from culture to culture. If effective prevention and education programmes are developed they could be applied in areas where drug use has not yet become pandemic.

WINBURN, G.M. and HAYS, J.R. Dropouts: A study of drug use. Journal of Drug Education 4(2): 249-254 (Summer, 1974)

For abstract, see Section VI. Drug Use/Abuse Prevention.

XI

Peripherally Related



XI. Peripherally Related

ABOOD, L.G. and HOSS, W. Kinetics of Ca^{2+} adsorption and cationic selectivity with a synaptic membrane protein. Biochimica et Biophysica Acta 332: 85-96 (1974)

A study was conducted on the adsorption of $^{45}Ca^{2+}$ to a surface film of a hydrophobic protein derived from synaptic membranes isolated from bovine cerebellum. A kinetic analysis of Ca^{2+} displacement from the protein by various metal and organic cations could be described by a rate law based on diffusion and displacement. The relative rate constants for the displacement of bound Ca^{2+} were in the order Li^+ less than Na^+, Rb^+ less than Cs^+ less than K^+, NH_4^+. Among the alkaline earth series the sequence was Mg^{2+}, Sr^{2+} less than Ba^{2+}. Ca^{2+} adsorption could be described by a theoretical formulation which takes into account an interfacial energy and potential barrier as well as the diffusional process. An attempt was made to consider the effect of energy of hydration of the cations, surface charge, and the chemical environment at the interface on catonic selectivity. The behavior of the cations in this system significantly resemble their behavior in natural membranes, particularly excitatory ones. The structural and physicochemical environment of the protein at the interface is discussed in relation to Ca^{2+} binding and cationic selectivity.

ABRAMS, R., VOLAVKA, J., ROUBICEK, J., DORNBUSH, R. and FINK, M. Lateralized EEG changes after unilateral and bilateral electro-convulsive therapy. Diseases of the Nervous System 31(11 Supplement): 28-33 (1970)

BABBINI, M. and DAVIS, W.M. Active avoidance learning in hamsters. Psychonomic Sciences 9(3): 149-150 (1967)

Hamsters were found to be very inefficient in acquiring a one-way locomotor avoidance response compared to albino rats, whereas an earlier report showed them to be much more proficient than rats in learning a lever-press avoidance response. Even fewer avoidances were made by hamsters when a visual rather than auditory CS was used. The deficiency in comparison to rats could not involve a general learning deficit since the hamsters showed much improvement in escape latencies. The results emphasize the importance of the required avoidance behavior in determining the relative learning proficiencies of different species.

BAKER, W.W. and KRATKY, M. Stabilizing influence of cholinergic pathways on chemically induced hyperactive states in the hippocampus. Federation Proceedings (in press)

BAKER, W.W. and ZIVANOVIC, D. Analysis of tremorgenic effects of intracaudate serotonin. Proceedings of the Society for Experimental Biology and Medicine 143: 1088 (1973)

In chronic cats, 5-HT injected into the caudate elicited tremors which were ascribed to a local excitatory effect. The 5-HT tremors developed rapidly, were of short duration and exhibited no tachyphylaxis. Tremor responses were readily antagonized by methysergide, reversibly suppressed by DA and prolonged by pargyline without a corresponding increase in amplitude. Development and maintenance of 5-HT tremor activity is substantially independent of cholinergic intervention. Based on its intracaudate profile of action and its ability to modify the neuroregulatory actions of local neurotransmitters (ACh, DA), 5-HT has been assigned a modulator role in the caudate.

BANERJEE, S.P., SNYDER, S.H., CUATRECASAS, P. and GREENE, L.A. Binding of nerve growth factor receptor in sympathetic ganglia. Proceedings of the National Academy of Sciences 70(9): 2519-2523 (September, 1973)

^{125}I-Labeled nerve growth factor binds to membrane preparations from superior cervical ganglia of rabbit in a specific fashion indicative of an interaction with the physiological receptor. Of various tissues examined, binding was observed only in the superior cervical ganglia, a presumed target organ of nerve growth factor. Binding of labeled factor is displaced by nonradioactive factor but not by several other peptide hormones. Binding to ganglia of preparations of nerve growth factor treated with N-bromosuccinimide closely parallels their biological activity. Binding of nerve growth factor receptor is saturable with an affinity constant of about 0.2 nM, similar to the reported plasma levels of the factor. Nerve growth factor does not elicit insulin-like biological effects in isolated adipocytes, and it does not modify the binding of (^{125}I)insulin or (^{125}I)epidermal growth factor to fat cells or liver membranes.

BEAVER, W.T., BEECHER, H.K., BERENS, J., RENNER, J., WINKELMAN, A.C. and HARRIS, T. When relief of pain is the challenge. Patient Care 6(3): 22-53 (February, 1972)

Very often the type of pain a patient complains about can be handled by sedatives rather than by narcotics. For short term pain of moderate intensity, aspirin, per os, is a most valuable tool. Care must be taken to be aware of complication such as, gi bleeding, altered coagulation and hypersensitivity, however. When aspirin is contraindicated acetaminophen is the drug of choice. When more analgesic effect is needed, a combination of darvon or codeine and aspirin offers greater pain relief. Morphine is usually the narcotic of choice, but other potent analgesics such as pentazocine are acceptable when sensitivity is present. Preoperatively, a narcotic is not indicated unless the patient is in pain. If so give morphine; otherwise, tranquilizers or sedatives. Postoperatively, morphine im is indicated. In the case of terminal patients as little medication as possible should be used at first. Aspirin, alone, should now be the primary medication. Later, when the maximum narcotic dose is ineffective, a combination sedative narcotic will be useful. To cope with tolerance the drugs should be given P.R.N. and the patient should be convinced to settle for less than complete relief. When medical analgesia can no longer help, surgery may be considered; but before taking any steps, all risks should be carefully studied and weighed.

BENNETT, J.P., JR., LOGAN, W.J. and SNYDER, S.H. Amino acids as central nervous transmitters: The influence of ions, amino acid analogues, and ontogeny on transport systems for L-glutamic and L-aspartic acids and glycine into central nervous synaptosomes of the rat. Journal of Neurochemistry 21: 1533-1550 (1973)

The accumulation by synaptosomal fractions from rat central nervous system tissue of transmitter candidate amino acids and non-candidate amino acids was studied with respect to ionic requirements, metabolic inhibitors, structural analogues, and ontogeny. For L-glutamic and L-aspartic acids in cortex and spinal cord and glycine in spinal cord a stringent sodium requirement for high affinity uptake was demonstrated. Detailed kinetic analysis of the sodium requirement for glutamic acid uptake into cortical synaptosomal fractions suggests that: (1) sodium ion acts both competitively and non-competitively in determining the velocity of high affinity uptake; (2) in the absence of sodium ion only the low affinity uptake can be demonstrated; and (3) inhibition of the Na-K-ATPase enzyme system with ouabain reduces the velocity of uptake to 60% of control values in contrast to alanine whose synaptosomal uptake is less dependent on this enzyme system. No potent inhibitors of L-glutamic acid accumulation were found among several structural analogues or derivatives. The kinetic analysis for glycine accumulation was more complex and suggested allosteric interactions between glycine and sodium ion. Developmental studies revealed GABA and L-glutamic acid to have absolute sodium requirements for cortical synaptosomal accumulation from the 16th gestational day through adulthood, with glycine accumulation showing a decreasing sodium requirement as maturation proceeded over this period. The combined evidence suggests that sodium requirement for high affinity uptake is a characteristic of neuroactive substances and may be used as a screening tool to search for other neurotransmitter candidates.

BENNETT, J.P., JR., LOGAN, W.J. and SNYDER, S.H. Amino acid neurotransmitter candidates: Sodium-dependent high-affinity uptake by unique synaptosomal fractions. Science 178: 997-999 (December, 1972)

Glutamic and aspartic acids and glycine are accumulated by high-affinity uptake systems into synaptosomal preparations in central nervous tissue. Sodium is required by these high-affinity transports, but not by the low-affinity transports for these and other amino acids. The sodium-requiring amino acid uptake systems label unique synaptosomal fractions. Observations suggest that these amino acids serve specific synaptic functions, presumably as neurotransmitters.

BENSON, H., HERD, J.A., MORSE, W.H. and KELLEHER, R.T. Behaviorally induced hypertension in the squirrel monkey. Circulation Research 27(Supplement 1): 1-21 - 1-26 (July, 1970)

Increased mean arterial blood pressure may occur during behavioral experiments in the unanesthetized monkey. Operant conditioning schedules that exert strong control over a monkey's key-pressing behavior can also induce marked, persistent elevations in systemic mean arterial blood pressure. The present report confirms and extends the previous studies. It describes increased mean arterial blood pressure occurring during behavioral experiments in five unanesthetized squirrel monkeys. Each monkey had been trained to press a key (respond) under a fixed-ratio schedule of termination of a stimulus associated with noxious stimuli and had developed marked, persistent elevations of

Benson, H., Herd, J.A., Morse, W.H. and Kelleher, R.T. continued.
mean arterial blood pressure. In one monkey that died, there were petechial hemorrhages of the renal cortex and focally proliferative, obliterative renal arterial changes.

BILLINGS, D.K. and FERRARO, D.P. Integration of a Hewlett-Packard mini-computer with digital-logic controlled behavioral laboratories. Behavior Research Methods and Instrumentation 6(1): 43-45 (1974)

A Hewlett-Packard on-line minicomputer controller for a new primate laboratory was integrated with existing equipment in digital-logic controlled rat and pigeon laboratories so as to maximize the utility of the separate systems.

BYRD, L.D. Responding in the cat maintained under response-independent electric shock and response-produced electric shock. Journal of the Experimental Analysis of Behavior 12: 1-10 (January, 1969)

Key-pressing responses in the cat were maintained under conditions in which brief electric shock was first postponed by responses (avoidance), then periodically presented independently of responses, and finally produced by responses on a fixed-interval schedule of 15 min (FI 15-min). A steady rate of responding occurred under shock avoidance and under response-independent shock; positively accelerated responding was engendered by the FI 15-min schedule. A second experiment studied responding under second-order schedules composed of three FI 5-min components. Responding was suppressed when a stimulus was presented briefly at completion of each FI 5-min component and a shock followed the brief stimulus at completion of the third component. Responding was maintained when each of the first two components was completed either with or without presentation of a brief stimulus and a shock alone was presented at completion of the third FI 5-min component.

BYRD, L.D. Responding in the squirrel monkey under second-order schedules of shock delivery. Journal of the Experimental Analysis of Behavior 18: 155-168 (1972)

Lever-pressing responses were maintained in the squirrel monkey when the only consequence of responding was the delivery of a response-produced electric shock, or alternatively, a brief visual stimulus that was occasionally followed by an electric shock. When shock was produced by the first response occurring after 8 min (8-min fixed interval schedule), a period of no responding at the beginning of the interval was followed by a gradual increase in response rate during the interval. Similar rates and patterns of responding were maintained when a 1-sec visual stimulus was produced by the first response occurring after 8 min and shock delivery followed the brief stimulus. Subsequently, patterns of positively accelerated responding were engendered during individual fixed-interval components when the first response occurring after 4 min produced a 1-sec visual stimulus and shock delivery followed the second, and later the fourth, presentation of the 1-sec stimulus. When the duration of the brief stimulus was varied over a 100-fold range from 0.1 to 10.0 sec (1) mean response rates decreased monotonically as stimulus duration increased, and (2) patterns of positively accelerated responding were least variable and response rates during the initial part of each 4-min interval were lowest at a stimulus duration of 1 sec.

CARDER, B. and BECKMAN, G.C. Limitations of "container neophobia" as an explanation of rats' responding for food in the presence of free food. Behavioral Biology (in press)

The hypothesis that responding for food in the presence of free food results from "container neophobia" was discussed. An alternative explanation of the data cited in support of this hypothesis was presented: that habits established during training largely determine the performance of Ss tested for responding in the presence of free food. A study in which container neophobia was not confounded with habits established in training was described. Rats pre-exposed to the free food container before being tested for responding in the presence of free food performed no differently from rats which did not receive this pre-exposure. Thus the data failed to confirm the hypothesis that container neophobia is the principal determinant of responding in this situation.

CHAMBERS, C.D. Conflict and cooperation between data-seeking and data-providing organizations. Proceedings of the Fourth National Conference on Methadone Treatment. New York: NAPAN, 1972. P. 323.

The conflicts which exist between organizations which seek data and those who are called upon to provide it in the field of addiction and treatment were discussed. It is believed that the major conflicts between these two organizations involve differences in values placed upon the data and a natural concern for the ultimate uses of the data. It is suggested that administrative needs be separated from research needs to increase the level of cooperation between organizations. Those providing data should be told how the data is to be used. Those seeking data should design and standardize administrative instruments to collect only the minimal data required to meet administrative needs, and to monitor the items for possible reduction constantly. They should also take time to design a meaningful research project, and to make an effort to be honest and fair with the data providers. It is suggested that organizations be purged of incompetents and those not committed to the highest levels of professionalism.

CHAMPLIN, F.B., COTTER, C.F., MOSKOWITZ, M.D., ROSSMAN, M., SHEPPARD, C. and MERLIS, S. A comparison of chlormezanone, meprobamate and placebo. Clinical Pharmacology and Therapeutics 9(1): 11-15 (1968)

A double-blind, comparative survey was conducted on a combined sample of inpatients and outpatients presenting moderate degrees of anxiety, depression, somatic concern, and tension. Patients were randomly assigned to therapy. Twenty-one patients received chlormezanone averaging 500 mg. (200 to 800 mg.) daily, for a maximum of 6 weeks. Twenty-one patients were treated with an average of 500 mg. of meprobamate (400 to 600 mg.) daily. Twenty-four patients were treated with an average of 3 placebo capsules (2 to 8) daily, for a maximum of 6 weeks. Ratings were conducted prior to and 2 weeks following medication, 6 weeks after the start of medication, and 2 weeks after medication stopped. Based upon the dual criteria of symptom reduction and frequency and intensity of untoward reactions, meprobamate was the more effective drug in this study.

CHAPEL, J.L. and TAYLOR, D.W. Glue sniffing. Missouri Medicine 65(4): 288-296 (April, 1968)

For abstract, see Section VIII. Psychosocial Studies.

CHIPPENDALE, T.J., COTMAN, C.W., KOZAR, M.D. and LYNCH, G.S. Analysis of acetylcholinesterase synthesis and transport in the rat hippocampus: Recovery of acetylcholinesterase activity in the septum and hippocampus after administration of diisopropylfluorophosphate. Brain Research 81: 485-496 (1974)

The site and rate of synthesis, as well as the transport dynamics of newly synthesized acetylcholinesterase (AChE) has been studied in the septum and hippocampus of the rat. Histochemical and biochemical techniques were employed to study time-dependent changes in AChE activity of the medial septal nucleus and hippocampus following systemic administration of the anticholinesterase diisopropylfluorophosphate. In both septum and hippocampus, an initially rapid phase of recovery was followed by a slower recovery with similar rate constants for the two regions. Analysis of AChE synthesis in the septo-hippocampal system revealed that recovery of activity in the septum ($t_{\frac{1}{2}}$ for recovery = 140 h) preceded that in the hippocampus ($t_{\frac{1}{2}}$ for recovery = 400 h). The data suggested that the bulk of septal AChE in the hippocampus is transported via the slow component of axoplasmic flow (about 2 mm/day). A fast component may exist, but the experimental arrangement did not permit the clear demonstration of any rapid axoplasmic flow.

CHOULIS, N.H. and PAPADOPOULOS, H. Slowly eroding tablets containing quinine sulfate. Journal of Pharmaceutical Sciences (in press)

COHEN, S., DITMAN, K.S. and HAYMAN, M., editors. Household Hallucinogens. Compton, California: Vista Hill Psychiatric Foundation, 1972.

Common household items which may cause accidental or intentional intoxication are reviewed. These are: nutmeg, mace, commercial solvents, aerosols, anesthetics, cough syrups, nasal inhalers and sprays, antihistamines, anticholinergics, certain garden plants, and items containing alcohol.

CORBY, J.C. and KOPELL, B.S. The effect of predictability on evoked response enhancement in intramodal selective attention. Psychophysiology 10(4); 335-346 (1973)

We investigated the relationship between the attention enhancement of the visual average evoked response (AER) and the S's ability to predict the presentation of the attended stimulus. Twelve students were presented with sequences of two distinct visual stimuli while DC EEG and electro-oculogram (EOG) were simultaneously recorded. Stimuli were either regularly alternated (predictable) or randomly intermixed (nonpredictable). Verbal instructions directed S's attention and push button response to either one or both of the two stimuli. Interstimulus interval was held constant to permit computer averaging of the AER a[illegible] the contingent negative variation.

Corby, J.C. and Kopell, B.S. continued

Selective attention enhanced the late positive component of the AER equally in the two conditions of predictability. Thus, it seems that the AER enhancement with intramodal selective attention does not depend on the S's ability to predict the presentation of the attended stimulus or to differentially arouse prior to its presentation. In the high predictability condition, the baseline EEG potential fluctuated with attention such that the AERs to the attended stimuli were negative relative to those to the ignored stimuli.

DACHOWSKI, L. Reward size effects in the double runway. Psychonomic Science 9(3): 157-158 (1967)

Rats received one of three sizes of reward or no reward in the first goal box of a double runway. Reward size had some effect on Runway-1 running and goal speeds, but never-rewarded Ss did give acquisition curves for these measures and start scores. The only Runway-2 effect was a temporary depression of start speed for Ss given the smallest reward. Open-field pretesting did not affect speeds.

DACHOWSKI, L. and DUNLAP, W.P. Frustrative nonreward effects in acquisition under zero hours deprivation. Psychonomic Science 14(3): 113-114 (1969)

Facilitating effects of partial reinforcement were found when six female rats were given 80 trials in a runway under zero food deprivation and with sucrose reward pellets. The three Ss trained under 50% reinforcement were initially slower than the 100% sSs, but with continued training finally reached higher speeds. This effect was greatest for speed measured in the middle of the response chain. The results were discussed in terms of the theories of Spence and Amsel.

DAVIS, J.M., JANOWSKY, D.S. and EL-YOUSEF, J.K. The use of lithium in clinical psychiatry. Psychiatry Annals 3(2): 78-99 (1973)

DAVIS, J.M., JANOWSKY, D.S., EL-YOUSEF, M.K. and SEKERKE, H.J. Provocation of psychotic symptoms in schizophrenia by methylphenidate. Society for Neuroscience 2: 155 (1972)

DEWS, P.B. Effects of biogenic amines on operant behavior. Neurosciences Research Program Bulletin 5: 78-80 (1967)

DEWS, P.B. Studies on responding under fixed-interval schedules of reinforcement: The effects on the pattern of responding to changes in requirements at reinforcement. Journal of the Experimental Analysis of Behavior 12:191-199 (March, 1969)

In pigeons responding under a 180 sec fixed-interval schedule of reinforcement, the frequency distribution of the duration of the final interresponse time before the reinforcer was compared with the distribution of the preceding two interresponse times. The results confirmed qualitatively and quantitatively the expected preferential reinforcement of longer interreinforcement times under fixed-interval reinforcement. Requirements at reinforcement were then changed to eliminate the preferential reinforcement of longer interresponse times. Local patterns and mean rate of responding could change, without the characteristic fixed-interval pattern of increasing responding through the interval (scalloping) being much affected. It is concluded that this characteristic pattern of fixed-interval responding does not depend crucially on the effects of the reinforcer at the moment of reinforcement, but rather to effects extending over much longer periods of time than just the last interresponse time.

DEWS, P.B. The theory of fixed-interval responding. The Theory of Reinforcement Schedules. Edited by W.N. Schoenfeld. New York: Appleton-Century Crofts, 1970.

DEWS, P.B. and HERD, J.A. Behavioral activities and cardiovascular functions: Effects of hexamethonium on cardiovascular changes during strong sustained static work in rhesus monkeys. The Journal of Pharmacology and Experimental Therapeutics 189(1): 12-23 (1974)

Rhesus monkeys have been trained to pull with a force of about 80% of their body weight. During pulls, there was a sustained increase in mean arterial blood pressure of about 20 mm Hg and a longer lasting increase in heart rate. Hexamethonium i.m. caused a dose-dependent decrease in resting mean arterial pressure to an asymptote at 40 to 50 mm Hg with doses of hexamethonium of 10 mg/kg or larger. The rise in mean arterial blood pressure during a pull was not attenuated by hexamethonium in doses which prevented the increase in heart rate. Neither atropine nor phentolamine after hexamethonium prevented the pressor response to pulling. It appears, therefore, that the pressor response does not require mediation by the autonomic nervous system. It is suggested that the blood pressure increase during ganglionic blockade is due to mechanical factors related to the contraction of the skeletal muscles. The large cardiovascular effects of skeletal muscle contraction, even in a relatively motionless subject, make the inference of direct environmental or emotional effects on cardiovascular function hazardous.

DEWS, P.B. and WIESEL, T.N. Consequences of monocular deprivation on visual behaviour in kittens. Journal of Physiology 206: 437-455 (1970)

DITMAN, K.S. The value of LSD in psychotherapy. The Problems and Prospects of LSD. Edited by J. Ungerleider. Springfield, Illinois: Charles C. Thomas, 1968.

For abstract, see Section V. Adverse Effects, Toxicity and Genetic Effects.

DOMINO, E.F. Effects of preanesthetic drugs on visually evoked responses. Anesthesiology 28: 184-191 (1967)

The results of this excursion into clinical and laboratory neuropharmacology may not as yet be particularly meaningful clinically primarily due to our lack of understanding of the nature of the VER in man. The monkey may be a useful substitute for the study of man awake, asleep, and during anesthesia.

What is clear in both species is that during general anesthesia a great deal of visual input is reaching the cerebral cortex. Only very deep general anesthesia with the more potent anesthetics completely abolishes the evoked responses recorded in the cortex.

DOMINO, E.F., McCARTHY, D.A. and DENEAU, G.A. General anesthesia in infrahuman primates. Federation Proceedings 28: 1500-1509 (1969)

DOMINO, E.F. and STAWISKI, M. Modification of the cat sleep cycle by hemicholinium-3, a cholinergic antisynthesis agent. Research Communications in Chemical Pathology and Pharmacology 2: 461-467 (July-September, 1971)

The cholinergic antisynthesis agent hemicholinium-3 (HC-3) was given into the lateral ventricle in a dose of 50 mu-g (base) as the bromide salt to cats with chronic indwelling brain electrodes and an intraventricular cannula. Continuous EEG activity was monitored 0-24 hours after injection of the drug or an equimolar dose of sodium bromide in a solution with a similar osmotic tension and pH as cerebrospinal fluid. HC-3 reduced REM sleep for 6-12 hours after injection. After HC-3 a typical REM was observed, characterized by decreased eye movements and EMG activity, with irregular hippocampal theta with spikes and slow waves in the neocortical EEG. NREM sleep was increased and EEG wakefulness decreased. NaBr injections reduced slightly the percent of REM sleep, but only typical REM episodes were seen. In view of the fact that HC-3, in doses known to reduce subcortical ACh. produces such dramatic effects, it is concluded that cholinergic mechanisms are important in the full expression of both REM sleep and arousal.

DOWDALL, M. J. and SIMON, E. J. Comparative studies on synaptosomes from squid optic lobes. Journal of Neurochemistry 21: 969 (1973)

The uptake of (N-Me-^{3}H)choline into synaptosomes from squid optic lobes was studied using a Millipore filtration technique. When incubated in an artificial sea water medium at 26°C, but not at 0°C, the synaptosomes rapidly accumulated choline, most of which could be recovered as unchanged free choline. The accumulated choline was readily released by treatment of the synaptosomes with Triton X-100 or exposing them to hypoosmotic conditions. The influx of choline increased with increasing concentrations of choline and could be resolved into saturable and non-saturable components. Kinetic analysis revealed the presence of two saturable components one of high affinity (K_m about 2mu-M) and one of lower affinity (K_m greater than or equal to 25 mu-M). The rate of choline uptake by these synaptosomes was considerably greater than by mammalian brain synaptosomes. Both high and low affinity systems were Na^+-requiring and inhibited by hemicholinium no. 3, levorphanol and dextrophan. NaCN, 2,4-dinitrophenol and ouabain also inhibited choline uptake, the high affinity system being particularly sensitive to these agents. It is suggested that the high affinity system is specific for cholinergic terminals.

ELLINWOOD, E. H., JR. Perception of faces. Psychiatric Quarterly 43: 622-646 (October, 1969)

ELLINWOOD, E. H., JR., DUARTE-ESCALANTE, O., MITCHELL, R. and HART, L. Behavior-EEG correlation by split screen TV recording. Physiology and Behavior 5: 625 (1970)

A split screen TV technique in which both behavior and EEG polygraph write out are simultaneously recorded is described. This technique allows for comparison of time relationships between electrical activity and behavior.

EVANS, H. L. Rats' activity: Influence of light-dark cycle, food presentation and deprivation. Physiology and Behavior 7: 455-459 (1971)

Environmental events such as light-dark cycle and schedule of food presentation are compared with internal stimuli of food deprivation as determinants of rats' locomotor activity. A new method is described for measuring locomotor activity concurrently with operant behavior. With food presentations at fixed intervals of either 120 sec or 24 hr, deprived rats displayed activity patterns characteristic of FI behavior, with increased activity only when food presentation was imminent. The similarity in effects of the 120 sec and 24 hr schedules suggests that physiological changes accompanying hunger are not responsible for the temporal activity pattern. Nondeprived rats displayed a similar pattern, suggesting the increase in activity was more related to the palatability of the food and to the probability of reinforcement than to effects of deprivation per se. The activity pattern was less pronounced when food presentation was contingent upon a lever-press. Lever-pressing rates and activity levels were lower in the light than in the dark. This difference was often more pronounced immediately before food presentation. The greatest output of activity was associated with the onset of the dark phase of the light-dark cycle, regardless of deprivation conditions. The importance of the test environment and similarities to adjunctive behavior are discussed.

FENIMORE, D.C., LOY, P.R. and ZLATKIS, A. High temperature tritium source for electron capture detectors. Application to a low volume detector. Analytical Chemistry 43(14): 1972-1975 (December, 1971)

A tritium ionization source capable of sustained operation at 300°C was evaluated for use in electron capture detectors. The high specific activity of the source permitted utilization of a relatively small source area in a low volume coaxial geometry detector designed for operation at elevated temperatures. Use of this detector at low carrier gas flows associated with capillary columns was demonstrated.

FINK, M. CNS effects of convulsive therapy: Significance for a theory of depressive psychosis. Disorders of Mood. Edited by J. Zubin and F. Freyhan. Baltimore, Maryland: Johns Hopkins Press, 1972. Pp. 93-112.

FINK, M. Computers in psychiatry. Textbook of Psychiatry. Edited by A.M. Freedman and H. Kaplan. Baltimore, Maryland: The Williams and Wilkins Company, 1967. Pp. 232-238.

FINK, M., editor. Convulsive Therapy. Seminars in Psychiatry, Vol. 4. New York: Grune and Stratton, Inc., 1972.

FINK, M. EEG applications in psychopharmacology. Psychopharmacological Agents, Vol. III. Edited by M. Gordon. New York: Academic Press, 1974. Pp. 159-174.

FINK, M. Long-acting (depot) phenothiazines in emergency and maintenance therapy of psychosis. The Role of Drugs in Community Psychiatry. Edited by C. Shagass. Modern Problems of Pharmacopsychiatry 6: 78-82 (1971)

FINK, M. Neurophysiological response strategies in the classification of mental illness. The Role of Methodology of Classification in Psychiatry and Psychopathology. Edited by M.M. Katz, J.O. Cole and W.E. Barton. Washington, D.C.: U.S. Government Printing Office, 1968. Pp. 535-540.

FINK, M. The therapeutic process in induced convulsions (ECT). Seminars in Psychiatry 4: 39-46 (1972)

FINK, M. and ABRAMS, R. Answers to questions about ECT. Seminars in Psychiatry 4: 33-38 (1972)

FINK, M. and ABRAMS, R. Selective drug therapies in clinical psychiatry: Neuroleptic, anxiolytic, and antimanic agents. Treating Mental Illness: Aspects of Modern Therapy. Edited by A.M. Freedman and H. Kaplan. New York: Atheneum, 1972. Pp. 287-309.

FINK, M. and ITIL, T. Organic treatment of schizophrenia. Textbook of Psychiatry. Edited by A.M. Freedman and H. Kaplan. Baltimore, Maryland: The Williams and Wilkins Company, 1967. Pp. 661-664.

FINK, M., KETY, S., McGAUGH, J. and WILLIAMS, T., editors. Psychobiology of Convulsive Therapy. Washington, D.C.: V.H. Winston and Sons, 1974.

FIORENTINO, D., SHEPPARD, C. and MERLIS, S. Emotions profile index (EPI) pattern for paranoid personality types: Cross-validation and extension. Psychological Reports 26: 303-308 (1970)

The possibility of defining an emotion profile consistent with personality type was examined in this cross-validational study. The procedure contrasted a sample of newly admitted acute paranoid schizophrenic patients, who were identified by clinical procedures and judgment, with a group of narcotic users who were defined as paranoid personality types on the basis of their responses to self-report inventories. When the resulting Emotions Profile Index scores were compared for these two groups, they showed high similarity. This suggests the possibility of identifying emotion profile types which are consistent with underlying personality types.

FOOTE, W.E., MACIEWICZ, R. and MORDES, J.P. Effect of midbrain raphe and lateral mesencephalic stimulation on spontaneous and evoked activity in LGN of the cat. Experimental Brain Research 19: 124 (1974)

Single shock stimulation of the midbrain raphe and lateral reticular formation altered the spontaneous and evoked activity of single cells in the dorsal lateral geniculate of the cat. The effect of stimulation was to produce a facilitation of 64 units with a latency of 15 msec or greater and an inhibition of 30 units with a latency of 7-10 msec. These two effects were jointly confirmed by computation of post-stimulus time histograms and by conditioning-test procedures employing stimulation of optic tract and stimulation.

FORD, J.M., MACPHERSON, L. and KOPELL, B.S. Differences in readiness potential associated with push-button construction. Psychophysiology 9(5): 564-567 (1972)

For the purposes of psychophysiological experiments that require an operant response, a push-button switch that utilized the skin resistance of the thumb was constructed. The skin contact push-button (SC-PB) produced a more negative pre-response slow potential shift recorded at the vertex than the standard push-button (S-PB), using 6 subjects in a repeated measures design.

FORREST, F.M., FORREST, I.S. and FINKLE, B.S. Alcohol-chlorpromazine interaction in psychiatric patients. Agressologie 13: 67-74 (1972)

Chronic mental patients on long-term therapy with 6,000 - 12,000 mg. chlorpromazine per day were administered 50 or 75 ml ethanol. The majority of patients showed decreased urinary excretion of chlorpromazine and its metabolites during the 24 hr. period following ethanol administration. Thus, alcohol affected chlorpromazine metabolism.

Forrest, F.M., Forrest, I.S. and Finkle, B.S. Alcohol-chlorpromazine...continued Conversely, chlorpromazine did not affect concentrations of alcohol in blood and urine which were found dependent solely on the amount of ethanel ingested. Patients on chlorpromazine therapy and control subjects showed virtually the same alcohol concentrations in blood and urine, after identical ethanol intake.

FORREST, I.S., BROOKES, L.G., FUKAYAMA, G. and SERRA, M.T. Interference of chemoluminescence with (^{3}H) scintillation counting. Journal of Pharmacy and Pharmacology 23: 705-707 (1971)

FRACCHIA, J., SHEPPARD, C. and MERLIS, S. Predicting response to psychoactive drugs. Psychological Reports 25: 698 (1969)

FREILICH, N., ITIL, T. and FINK, M. Social class and prognosis of schizophrenia. Turk Noro-Psikiyatri Arsivi 4: 1-12 (1967)

FREILICH, N., ITIL, T., FINK, M. and HOLDEN, J.M. The influence of family structure and attitudes on the course and prognosis of schizophrenia. Turk Noro-Psikiyatri Arsivi 5: 1-10 (1968)

FRIEDHOFF, A.J. Catecholamines and mental state. Biological Diagnosis of Brain Disorders. Edited by S. Bogoch. New York: Spectrum Publications, Inc., 1973. Pp. 95-101.

FRIEDHOFF, A.J. Possible abnormalities in transmethylation processes in schizophrenia. Psychiatry. Proceedings of the 5th World Congress of Psychiatry. Edited by R. de la Fuente and M.N. Weisman. Amsterdam, the Netherlands: Excerpta Medica Foundation, 1973. Pp. 866-870.

FRIEDHOFF, A.J. Transcultural aspects of biochemical studies. Presented at the Symposium of Transcultural Aspects of Neuropsychopharmacology, Istanbul, Turkey, 1974.

GARMAN, R.H., WEISS, B. and EVANS, H.L. Alkylmercurial encephalopathy in the monkey. Acta Neuropathologica (in press)

GELLER, I., CAMPBELL, N.D. and BLUM, K. Protection against acute alcoholic intoxication with diethanolamine-rutin. Research Communications in Chemical Pathology and Pharmacology 1(3): 383-394 (1970)

Diethanolamine-rutin (D-R) protected rats against ethanol-induced intoxication. The effect was demonstrated in three test procedures. It was conjectured that the protective action of D-R might be attributable to a slowing of the rate of absorption and subsequent build-up of blood ethanol, an enhanced elimination of blood acetaldehyde or perhaps competition with acetaldehyde or ethanol for similar neural binding sites in the brain.

GERALD, M.C. and MAICKEL, R.P. Studies on the possible role of brain histamine in behavior. British Journal of Pharmacology 44(3): 462 (March, 1972)

The possible role of brain histamine in behavioural performance was studied in rats using thirst-induced water consumption, continuous (Sidman) avoidance, and reinforcement withdrawal test systems.

Parenteral administration of a variety of antihistamines to rats decreased thirst-induced water consumption; this effect could be antagonized by administration of histamine directly into the brain by a ventricular cannula.

When intraventicular doses of histamine were administered to rats at weekly intervals, an adaptation was seen in the effects of the amine on continuous avoidance behaviour. With succeeding doses, the initial period of depression of avoidance responding was shortened and the subsequent rebound stimulation disappeared.

The results support the hypothesis that histamine in the brain is involved in several behavioural phenomena.

GHISELLI, W.B. and THOR, D.H. The rodent model of irritable aggression: A method for analyses of individual roles in paired fighting. Bulletin of the Psychonomic Society 4(1): 17-19 (1974)

Ten pairs of Long-Evans male rats were selected for reliable fighting to footshock. For each pair, one member (on Day 1), and the other member (on Day 2), was temporarily rendered docile by local anesthesia of the vibrissal pad. Attack scores decreased significantly (p less than .0001) when one member was anesthetized, but component elements of the score varied in direction. Biting increased (p less than .001) and boxing decreased (p less than .0001). Upright and supine posturing mean differences were nonsignificant. The results suggest an inherent ambiguity in standard observational measures of paired fighting behavior. The present method has evident potential for discriminating nonapparent dominance relationships in normally fighting pairs and for stabilizing aggressor-target roles in the shock-elicited aggression paradigm.

GHISELLI, W.B., THOR, D.H. and WARD, T.B. A social-fighting test of the Crosby-Cahoon supersitious responding hypothesis in shock-elicited aggression. The Psychological Record 24: 47-52 (1974)

Crosby and Cahoon (1973) have proposed that the typical use of constant duration shock in shock-elicited social fighting between mature male rats may account for the general increase in fighting normally observed over sessions. In a test of their hypothesis, a variable duration shock group was compared with 2 constant duration shock groups. All groups demonstrated a significant increase in fighting over sessions. The results are discussed in reference to superstitious learning and alternative explanations of the "sessions effect" in shock-elicited fighting of rodents.

GIBBON, J. Scalar timing and semi-Markov chains in free-operant avoidance. Journal of Mathematical Psychology 8: 109-138 (1971)

Scalar timing is proposed as the basic latency mechanism underlying asymptotic free-operant avoidance performance. Timing in free-operant schedules results in a semi-Markov chain in which transition times may depend upon the state to be entered as well as the state occupied. Results for finite chains on asymptotic state occupancy probabilities are summarized, and an explicit solution for the mean first passage time matrix is derived. Applications of these results using the scalar property provide a first order description of mean interresponse and intershock time functions for a variety of cued and uncued free-operant schedules. Occasional deviant performances appear to result from the standard scalar timing mechanism with infrequent random breakdowns.

GIBBON, J. Timing and discrimination of shock density in avoidance. Psychological Review 79: 68-92 (1972)

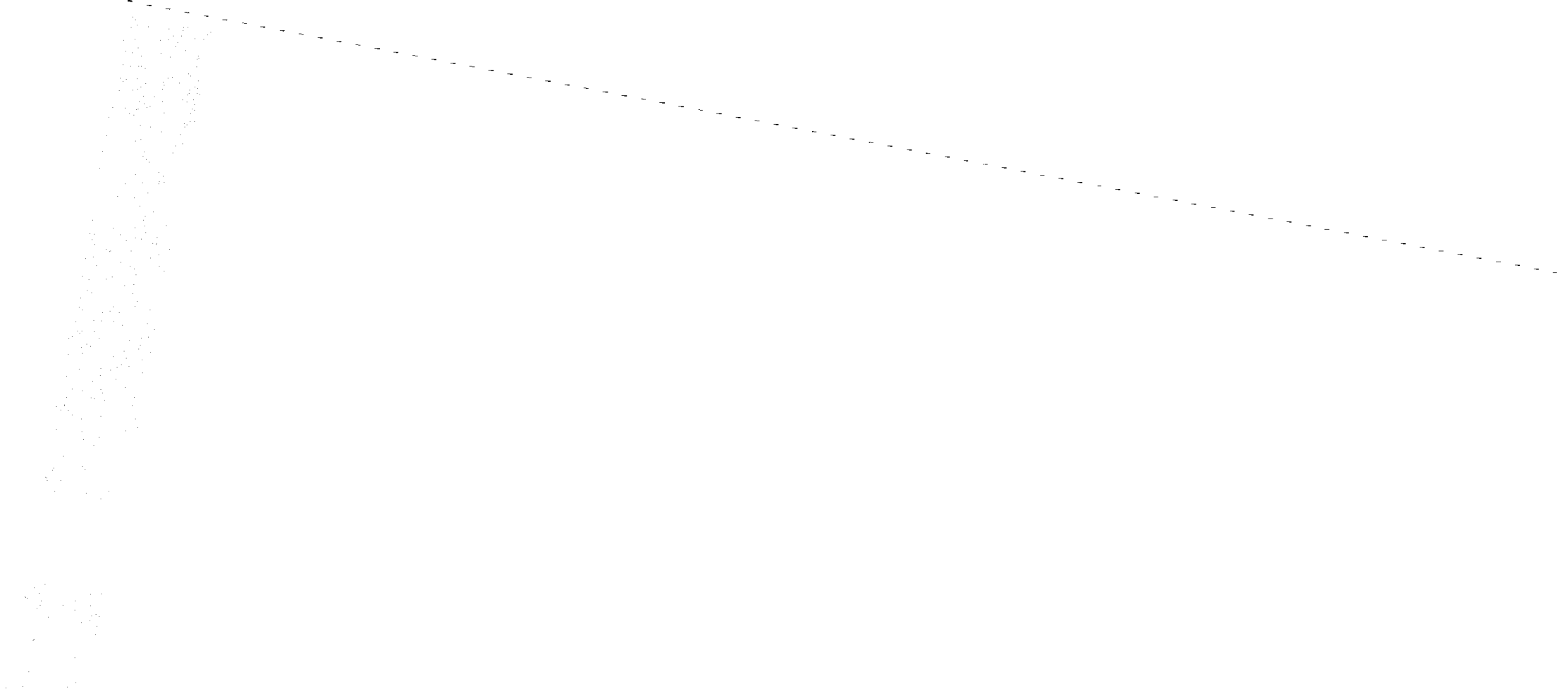
A theoretical account of asymptotic avoidance behavior is proposed which deals with shock density effects. Behavior at asymptote is characterized by the operation of two processes. An elementary scalar timing process generates response latencies proportional to the length of the preshock interval. However, responding occurs only when subjects discriminate a "worthwhile" or biased difference between intershock intervals containing at least one response, and intershock intervals containing no responses. The two processes operating in avoidance schedules result in stochastic systems known as semi-Markov chains. Analysis of these chains are shown to produce first-order descriptions of response rates and shock rates on the standard, uncued free-operant avoidance schedule and on several variants. The formulations for the discrimination process require a strong bias in favor of not responding. Extrapolation to classical cued avoidance suggests that a similar bias is responsible for the "avoidance decrement" phenomenon. A less extreme bias may account for maintained responding on a retractable lever in a discrete trial procedure in which responses postpone but do not eliminate shock.

GIBBON, J. and HUNT, H.F. Post-shock of discriminations in the acquisition of free-operant avoidance by rats. The Psychological Record 22: 151-159 (1972)

Acquisition of free-operant avoidance was studied during 5 days of training in 36 rats. The response-shock interval was 20 sec., and an escape response was required in shock. Temporal discriminations of the response-shock interval were indicated by rising conditional probability of response functions for some of the animals on Days 4 and 5 of training. No Ss showed temporal discriminations in their over-all interresponse time distributions before Day 4. However, as early as the first day of training, discriminations were obtained with some Ss when responding directly after shock was considered separately. These early post-shock discriminations appeared only for Ss that eventually became efficient avoiders. However, many Ss learned to avoid without showing a temporal discrimination.

GIBBON, J. and RUTSCHMANN, R. Temporal order judgment and reaction time. Science 165: 413-415 (July, 1969)

A model which predicts judgment of the temporal order of stimuli from from simple reaction time is proposed. Visual data show covariation of the two measures with luminance changes, and suggest that (i) temporal order judgments reflect a biased response criterion and (ii) the motor component of reaction time has little variability relative to variance in receptor system latency.



GLICK, S.D., GOLDFARB, T.L. and JARVIK, M.E. Recovery of delayed matching performance following lateral-frontal lesions in monkeys. Communications in Behavioral Biology 3: 299-303 (May-June, 1969)

Four rhesus monkeys were overtrained on an automated delayed matching task for water reward. Bilateral surgical ablation of dorsolateral frontal cortex was then performed on two of the monkeys. The frontal monkeys showed an initial deficit in test performance which was dependent upon the presence of a minimal delay. The performance of the frontal monkeys gradually recovered to their preoperative level during 5 wk of postoperative testing.

GLICK, S.D., NAKAMURA, R.K. and JARVIK, M.E. Associative reversal in frontal monkeys: Reelicitation of a delay-specific deficit. Communications in Behavioral Biology 5: 165-169 (1970)

Eight rhesus monkeys were overtrained on an automated delayed matching task for water reward. Four of the monkeys, upon whom bilateral surgical ablation of dorsolateral frontal cortex had been performed, had shown an impairment in delayed matching accuracy which recovered with continuous postoperative testing. One and a half years following surgery the "set" of the test was reversed from matching to oddity. The frontal monkeys again showed a deficit in test permance which was dependent upon the presence of a minimal delay. The frontal deficit was again ameliorated with continuous testing.

GOLDFARB, T.L., GLICK, S.D. and JARVIK, M.E. Delayed matching performance of isolated frontal monkeys. Communications in Behavioral Biology 4: 67-70 (1969)

Delayed matching performance of four monkeys was studied under isolation conditions which diminished interference from extraneous environmental stimuli. Two of the animals had frontal lesions 6 months prior to this experiment and had shown recovery to control levels under standard conditions of the delayed matching test. Under both "light on" and "light off" testing in isolation, they showed decreased accuracy and response rate, while control animals exhibited only some decrease in response rate. It was concluded that the conditions represented a strong novel situation to the frontal monkeys which disrupted their performance.

GOLDSTEIN, A. The search for the opiate receptor. Proceedings of the 5th International Congress on Pharmacology, San Francisco, California, 1972, Volume 1. Pp. 140-150.

GOTT, C.T. and WEISS, B. The development of fixed-ratio performance under the influence of ribonucleic acid. Journal of the Experimental Analysis of Behavior 18: 481-497 (November, 1972)

The transition from fixed-ratio 1 performance (every response reinforced) to fixed-ratio 30 performance (every thirtieth response reinforced) was studied in nine pigeons. These were divided into three treatment groups given daily oral doses of saline, or 250 mg/kg/day or 500 mg/kg/day of yeast ribonucleic acid. Detailed computer-assisted analyses of how fixed-ratio behavior develops revealed the following typical sequence. After the transition, the first few ratios typically were emitted without long interresponse times within the ratio. Steady responding then ceased, and numerous long interresponse times occurred, with no systematic relationship to ordinal position within the ratio. Gradually, a new pattern evolved, characterized by a consistently long post-reinforcement time, a border region of the next few interresponse times within which the mean interresponse time monotonically decreased, and short interresponse times within the last 80% of the ratio. Long interresponse times were eliminated from this last section of the ratio without

Gott, C.T. and Weiss, B. continued
regard to proximity to reinforcement. Various analytical procedures suggested that the final pattern can be conceived, in part, as the shaping of a reliable response topography. The group of three pigeons given 250 mg/kg/day of yeast ribonucleic acid responded at higher rates than the saline and 500 mg/kg/day groups. The latter group, in contrast to the saline and lower dose groups, which continued to increase their rates, reached a rate asymptote very early.

GRABOWY, R.S. and ELLINWOOD, E.H., JR. On-line detection of EEG spindle activity. DECUS 42-45 (Spring, 1971)

GREEN, J.P., JOHNSON, C.L. and KANG, S. Application of quantum chemistry to drugs and their interactions. Annual Review of Pharmacology 14: 319-342 (1974)

HARVEY, J.A., SCHOLFIELD, C.N. and BROWN, D.A. Evoked surface-positive potentials in isolated mammalian olfactory cortex. Brain Research 76: 235-245 (1974)

HAYS, J.R., WINBURN, G.M. and BLOOM, R. Marijuana and the law: What young people say. Journal of Drug Education (in press)

HOLMES, W.F., HOLLAND, W.H., SHORE, B.L., BIER, D.M. and SHERMAN, W.R. A versatile computer generated variable accelerating voltage circuit for magnetically scanned mass spectrometers. Use for assays in the picogram range and for assays of stable isotope tracers. Analytical Chemistry (in press)

HOLTZMAN, S.G. and SCHNEIDER, F.H. Comparison of acetaldehyde and ethanol: Depression of motor activity in mice. Life Sciences 14: 1243-1250 (1974)

The fine and gross motor activity of mice was measured at 1-minute intervals for 15 minutes after intravenous administration of ethanol or acetaldehyde. Acetaldehyde transiently reduced both types of motor activity whereas the effects of ethanol were more prolonged. The 1-minute ED_{50} values for depression of fine and gross activity by acetaldehyde are 2.2 and 2.7 mg/kg, respectively. The corresponding values for ethanol are 740 and 516 mg/kg. The differences in relative potencies became smaller as the time interval over which activity was measured increased. Thus, the potency of acetaldehyde as a depressant of behavior relative to ethanol is considerably greater than has previously been reported if effects are determined immediately after drug administration.

HUGHES, L.F. and DACHOWSKI, L. The role of reinforcement and nonreinforcement in an operant frustration effect. Animal Learning and Behavior 1: 68-72 (1973)

Male albino rats were run in a discrete-trial two-bar operant analog of the double alley. Completion of a FR 4 response chain on the first bar was rewarded 50% of the time for the 12 experimental Ss, but was never rewarded for the 12 control Ss. Both groups received consistent reward at the end of a FR 4 chain on the second bar. Eighty-four trials were given at a rate of four trials per day. A significantly faster rate of responding on the second bar was found following nonrewarded first-bar ratios than following rewarded first-bar ratios. This frustration effect was not attributable to response depression, since the nonrewarded performance of the experimental group exceeded that of the control group.

HURST, P.M., BAGLEY, S.K. and ROSS, S. Effects of alcohol and methylphenidate on complex judgments. Psychological Reports 31: 59-67 (1972)

Methylphenidate HCI (12 mg/70 kg and 20 mg/70 kg), ethyl alcohol (60 g/70 kg), and a placebo (lactose) were given to 50 college student volunteers. Each S received each treatment once during 4 separate sessions, and treatment order was counterbalanced. Ss were experienced bridge players, who were given sets of bidding problems, which varied in storage load, ambiguity level, and answer format (open-ended vs multiple choice). Performances were scored according to (1) frequency of active bids vs passes, and (2) a figure-of-merit assigned to each possible response, as developed from expert consensus. Ss wrote impromptu editorials on assigned topics from which word-count measures of verbal production were derived, and also made periodic self-ratings on mood adjective check lists. No significant drug effects were found on bidding accuracy, although methylphenidate increased the frequency of non-passes. Alcohol produced significant efforts on eight mood clusters while methylphenidate produced little or no measurable effect. Verbal production, however, was reliably increased by methylphenidate but not significantly affected by alcohol.

ITIL, T., FINK, M. and ULETT, G. EEG patterns with combined drug treatments in psychotic patients. Turkish Journal of Electroencephalography and Clinical Neurophysiology 1: 1-19 (1967)

ITIL, T., KESKINER, A. and FINK, M. Effect of sulthiame in schizophrenic patients. Proceedings of the First International Congress of the Academy of Psychosomatic Medicine. Edited by E. Dunlop. Amsterdam, the Netherlands: Excerpta Medica Foundation, 1967. Pp. 185-194.

ITIL, T., SHAPIRO, D., FINK, M., HICKMAN, C., KIREMITCI, N. and HOLDEN, J. M. C. On-line computer classification of electroencephalographic sleep stages. Psychophysiology 4: 366 (1967)

JANOWSKY, D. S., BERENS, S. and DAVIS, J. M. Correlations between mood, urinary electrolytes and weight during the menstrual cycle. Annals of Internal Medicine 7(5): 858 (1972)

A correlation between premenstrual-menstrual mood changes, weight changes, and alterations in the aldosterone-dependent urinary potassium-to-sodium ratio during the menstrual cycle was studied. Eleven female college-age volunteers were studied on a metabolic ward for a total of 410 days during which time 14 mensus occurred. Daily negative-affect self-ratings, preprandial postvoiding morning weights, and 24-hour urinary collections were obtained and analyzed for potassium-to-sodium ratios. All subjects were placed on a constant caloric intake and a 100 mEq/day sodium chloride diet and housed on a metabolic ward. Data analysis showed a significant positive correlation between the subject groups' negative affect for a given cycle day on the one hand and weight increases and urinary potassium-to-sodium ratios on the other. A late luteal-premenstrual - early-menstrual increase in all variables occurred. The results indicate that a temporal correlation between mood, potassium-to-sodium ratio, and weight gain exists during the menstrual cycle in a group of normal women. The observed dysphoria is temporally related to the potassium-to-sodium ratio changes, which would suggest that organic factors related to potassium/sodium balance and presumably the renin-angiotensin-aldosterone system that controls these changes may be a cause of premenstrual tension. This is consistent with the hypothesis that activation of the renin-angiotensin-aldosterone system correlates with and may cause premenstrual-menstrual psychiatric upsets.

JANOWSKY, D.S., EL-YOUSEF, M.K., DAVIS, J.M. and SEKERKE, H.J. Provocation of schizophrenic symptoms by intravenous administration of methylphenidate. Archives of General Psychiatry 28: 185-191 (February, 1973)

Methylphenidate (Ritalin) hydrochloride was administered intravenously to schizophrenic, manic, and depressed patients during the active phase of their illness and upon recovery and to normal. Methylphenidate was found to activate psychotic symptoms in schizophrenics during the active phase of their illness. It failed to produce this effect in the same patients after remission had occurred. It failed to produce a psychotic reaction in most patients with mania and all normal or depressed patients.

Methylphenidate-induced psychosis activation may serve as a model for the acute schizophrenic process. The mechanism by which methylphenidate produces these or other effects may lie in its effects on central dopamine.

JARVIK, M.E. An automated multiple choice test of short-term spatial memory for monkeys. Journal of the Experimental Analysis of Behavior 13: 317-318 (1970)

Since Hunter developed the delayed response test in 1913, it has been widely used in the study of memory, brain damage, and behavioral pharmacology. A major problem is that the usual dichotomous choice method allows the animal a 50% chance of being correct on any trial. Thus, it is necessary to average the results of many animals or many trials to obtain a reliable measure of accuracy. A few investigations (e.g., Riopelle, 1959) have utilized manual multiple choice delayed response procedures, but these have been tedious to conduct and have not provided a measure of the degree of error. The present multiple choice procedure was designed to provide a semi-quantitative measure of the degree of error on a single trial.

KAPLAN, J. Marijuana laws: An empirical study of enforcement and administration in Los Angeles County. UCLA Law Review 15: 1499-1542 (1968)

KELLEHER, R.T. and MORSE, W.H. Schedules using noxious stimuli. III. Responding maintained with response-produced electric shocks. Journal of the Experimental Analysis of Behavior 11: 819-838 (1968)

Responding was maintained in two squirrel monkeys under several variations of a 10-min fixed-interval schedule of electric shock presentation. The monkeys were first trained under a 2-min variable-interval schedule of food presentation, and then under a concurrent schedule of food presentation and shock presentation. In one monkey, when shocks (12.6 ma) followed each response during the last minute of an 11-min cycle ending with a timeout period, responding was increased during the first 10 min and suppressed during the last minute of each cycle. When the shock schedule was eliminated, both the enhancement and suppression disappeared, and a steady rate of responding was maintained under the variable-interval schedule. When the food schedule was eliminated, the shock schedule maintained a characteristic fixed-interval pattern of responding during the first 10 min, but suppressed responding during the last minute of each

Kelleher. R.T. and Morse. W.H. Schedules using noxious stimuli. continued cycle. The fixed-interval pattern of responding was maintained when the timeout period was eliminated and when only one shock could occur at the end of the cycle. In the second monkey, responding under the concurrent food and shock schedule was suppressed when responses produced shcoks after 3-min. Under an 11-min cycle, responding continued to be maintained at increasing shock intensities. When the food schedule was eliminated, a fixed-interval pattern of responding was maintained under a 10-min schedule of shock presentation (12.6 ma). Whether response-produced electric shocks suppressed responding or maintained responding depended on the schedule of shock presentation.

KELLEHER, R.T. and MORSE, W.H. Schedules using noxious stimuli. IV. An interlocking shock-postponement schedule in the squirrel monkey. Journal of the Experimental Analysis of Behavior 12: 1063-1079 (1969)

Responding was studied under various schedules of electric shock postponement and presentation in the squirrel monkey. Under an interlocking shock postponement schedule, successive responses decreased the time by which a response postponed the next scheduled shock until a shock immediately followed the nth response. Some parameters of this schedule, which can be formally related to fixed-interval schedules, engendered a pattern of positively accelerated responding between shocks. This pattern did not occur under comparable parameter values of an alternative fixed ratio, avoidance schedule under which each response postponed shock by a fixed duration and every nth response produced shock. Subsequently, performances were studied under schedules of shock presentation. Responding was never maintained under fixed-ratio schedules of shock presentation, but was maintained with a pattern of positive acceleration under an alternative fixed-ratio, fixed-interval schedule and under a fixed-interval schedule.

KOLTON, M. and DWARSHUIS, L. A clinical factor analytic method for inferring construct meaning. Journal of Educational and Psychological Measurement 33: 655-661 (1973)

KOPELL, B.S., WITTNER, W.K. and WARRICK, G.L. The effects of stimulus differences, light intensity, and selective attention on the amplitude of the visual averaged evoked potential in man. Electroencephalography and Clinical Neurophysiology 26: 619-622 (1969)

1. Stimuli may be designed so that the amplitude of the averaged evoked potential (AEP) produced by them may be sensitive or insensitive to the subject's attention.

2. The AEPs resulting from stimuli that are sensitive to attention are increased to a maximal amplitude when the subject is attending (responding) to the stimuli; when he is not, they are dependent on and proportional to the intensity of the stimuli.

3. The amplitude of AEPs produced by stimuli that are not sensitive to attention is proportional to the light intensity of the stimuli.

KOPELL, B.S., ZARCONE, V., de la PENA, A. and DeMENT, W.C. Changes in selective attention as measured by the visual averaged evoked potential following REM deprivation in man. Electrencephalography and Clinical Neurophysiology 32: 322-325 (1972)

After rapid eye movement (REM) and non-REM deprivation, the amplitude of the major component of the averaged evoked potential (AEP) in attention and nonattention conditions was measured. The difference between the AEP in the attention and the non-attention conditions is considered to be a measure of selective attention and is greater following REM deprivation. It is suggested that this narrowing of the attentive field may be due to increased arousal or greater central nervous system exitability following REM deprivation.

KRUMHOLZ, W.V., YARYURA-TOBIAS, J.A. and WHITE, L. The action of BC-105 in chronic schizophrenics with depression. Current Therapeutic Research 10: 342-345 (July, 1968)

BC-105 was studied in 18 chronic schizophrenics with symptoms of depression. The clinical findings suggest that this agent may be useful in patients with primary symptoms of depression. Side effects were minimal.

KULICS, A. T., CARLSON, K. R. and WERNER, G. Signal detection analysis of stimulus discrimination in normal and split-brain monkeys. Brain Research 81: 119-132 (1974)

Five split-brain and 5 control monkeys were trained to perform a go, no-go discrimination between cutaneous stimulation at two arm locations, and subsequently retrained using the other arm. Cardiac and instrumental response latency data from various periods during training and retraining were analyzed in terms of signal detection theory, with the objective of determining the extent to which behavior is differentially controlled by the discriminative stimuli, uncontaminated by other factors affecting response bias. This analysis revealed that differential stimulus control was minimal early in training, and that its growth and final extent, as reflected by both cardiac and instrumental response latencies, were highly comparable between subjects. Differential stimulus control of both cardiac and instrumental responses reached maximum prior to the time each subject attained a conventional criterion of percentage correct responses; we attribute this discrepancy to the influence of response bias factors. At the beginning of retraining on the opposite body side, all control subjects and the two split-brain subjects trained on the left size and retrained on the right immediately displayed differential stimulus control of both cardiac and instrumental responses, whereas the other 3 split-brain subjects trained in the opposite sequence showed no transfer of differential stimulus control of either response. We conclude that this analysis revealed a functional asymmetry in the direction of information flow within the central nervous system which becomes apparent after callosal section.

LATIES, V.G., WEISS, B. and WEISS, A.B. Further observations on overt "mediating" behavior and the discrimination of time. Journal of the Experimental Analysis of Behavior 12: 43-57 (January, 1969)

When the lever-pressing behavior of five rats was maintained by a DRL schedule (reinforcement was scheduled only when a specified waiting time between successive responses was exceeded), collateral behavior developed that apparently served a mediating function. In two cases this behavior did not arise until the experimental environment included pieces of wood that the rats started to nibble. When collateral behavior first appeared, it was always accompanied by an increase in responses spaced far enough apart to earn reinforcement. If collateral behavior was prevented, the number of reinforced responses always decreased. Extinction of lever pressing extinguished the collateral behavior. Adding a limited-hold contingency to the schedule did not extinguish collateral behavior. It appears that the rat can better space its responses appropriately when concurrently performing some overt collateral activity. The amount of this activity apparently comes to serve as a discriminative stimulus. To assume the existence of internal events that serve as discriminative stimuli in temporal discrimations is, at least under some circumstances, unnecessary.

LEVISON, P.K. and FINDLEY, J.D. Counting behavior in baboons: An error-contingency reinforcement schedule. Psychological Reports 20: 393-394 (1967)

2 baboons were trained to "count" by requiring the generation of specific numbers of tones associated with different visual stimuli. Performance was reinforced by food pellets on a fixed-ratio schedule of correctly-counted problem stimuli. After accurate and stable counting was obtained, reinforcement was made contingent upon the occurrence of at least one incorrectly-performed problem in the fixed-ratio sequence, in addition to the required number of correct solutions. Counting performances adjusted appropriately to the error contingency and prior levels of accuracy were readily recovered after the contingency was removed.

LIEF, V.F. and BROTMAN, R. The psychiatrist and community mental health practice. Community Mental Health Journal 4(2): 134-143 (April, 1968)

This paper deals with community mental health practice for the psychiatrist. It defines comprehensive community mental health, its scope, and the variety of centers that are emerging. It discusses the possible ways that various professions may be affected. It presents the similarities and differences between public health and community mental health. Medical and psychiatric education are discussed emphasizing the need for curricular change in preparation for future practice. An existing model now in operation at New York Medical College is described which affords an opportunity for the training of psychiatrists, other professionals and nonprofessionals as community mental health workers in multidisciplinary, task oriented teams engaged in action, training and research. Built into the program is a method for ongoing evaluation. This program also illustrates how the psychiatrist functions as a specialist, generalist, and community mental health worker.

LOE, P.R., TOMKO, D.L. and WERNER, G. The neural signal of angular head position in primary afferent vestibular nerve axons. Journal of Physiology 230: 29-50 (1973)

1. The relation between discharge frequency and angular head position was determined for a population of regularly discharging single first-order vestibular neurones in the eighth nerve of the barbiturate anaesthetized cat.

2. Each axon had a characteristic head position which was maximally excitatory to it, and a diametrically opposed head position which was minimally excitatory.

3. After correction for phase shifts introduced by the orientation of preferred excitability, discharge rate in statoreceptor afferents varied as a power function of the sine of angular head position with exponents ranging from 0·9 to 1·6.

4. Experimentally determined discharge rates were compared with the predictions of a computer simulation model incorporating the idea that shearing force acting on morphologically polarized receptors is the adequate stimulus for macular receptor cells.

5. This approach permitted the identification of a population of first-order vestibular afferents whose discharge frequency varied with head position as did the magnitude of shear force computed for individual receptors, each most excited in a particular head position.

6. The majority of the spatial orientations of maximal sensitivity defined a surface which is tilted by approximately 30° with reference to the Horsley-Clarke horizontal plane, implying that most statoreceptor afferents are maximally sensitive to position changes when the cat's head is at or near its normal position.

LOWY, K. and WEISS, B. Assessing the significance of averaged evoked potentials with an on-line computer: The split-sweep method. Electroencephalography and Clinical Neurophysiology 25: 177-180 (1968)

In studying averaged evoked potentials, most experimenters rely on the contours of the averaged wave form for judging whether the averaged signal is stable or for comparing two averages. The split-sweep method quantifies these judgments by using an on-line computer to compare two separate averages, one built up of odd-numbered sweeps, the other of even-numbered sweeps. One variant of the split-sweep method searches for a match between the positions of the maxima and minima in the two averages. The other employs a variation of the sign test to determine whether the two averages are more alike than their randomly shuffled counterparts.

McCABE, O.L., SAVAGE, C., KURLAND, A. and UNGER, S. Psychedelic (LSD) therapy of neurotic disorders: Short term effects. Journal of Psychedelic Drugs 5(1): 18-28 (Fall, 1972)

McKEARNEY, J.W. Fixed-interval schedules of electric shock presentation: Extinction and recovery of performance under different shock intensities and fixed-interval durations. Journal of the Experimental Analysis of Behavior 12: 301-313 (1969)

In squirrel monkeys responding under a schedule in which responding postponed the delivery of electric shock, the presentation of response dependent shock under a fixed interval (FI) schedule increased the rate of responding. When the schedule of shock-postponement was eliminated, so that the only shocks delivered were those produced by responses under the FI schedule, a pattern of positively accelerated responding developed and was maintained over an extended period. When responses did not produce shocks (extinction), responding decreased. When shocks were again presented under the FI schedule, the previous pattern of responding quickly redeveloped. In general, response rates were directly related to the intensity of the shock presented, and inversely related to the duration of the fixed-interval. These results raise fundamental questions about the traditional classification of stimuli as reinforcers of punishers. The basic similarities among FI schedules of food presentation, shock termination, and shock presentation strengthen the conclusions that the schedule under which an event is presented and the characteristics of the behavior at the time the event is presented, are of overriding importance in determining the effect of that event on behavior.

McKEARNEY, J.W. Rate-dependent effects of drugs: Modification by discriminative stimuli of the effects of amobarbital on schedule-controlled behavior. Journal of the Experimental Analysis of Behavior 14: 167-175 (September, 1970)

Food-deprived pigeons responded under a 10-min fixed-interval schedule of food presentation. During even-numbered minutes of the schedule, the discriminative stimuli were the same as those present when food was delivered. During odd-numbered minutes there was either a change in keylight color or a change in overhead illumination, either for the entire duration of the odd-numbered minutes, or for 3-sec after each response. Responding during even-numbered minutes showed the usual pattern of positive acceleration; responding during odd-numbered minutes was similarly graded, but rates were much lower. The response rate increasing effects of amobarbital were inversely related to control rates of responding for both even and odd-numbered minutes. However, when the stimulus change during odd-numbered minutes was either keylight color or a change from a darkened to a brightly illuminated chamber, increases in responding were considerably less than predicted on the basis of the effects on responding during even-numbered minutes. When the stimulus change was from a darkened to a dimly illuminated chamber, control rates of responding changed little, but increases in responding during odd-numbered minutes after amobarbital were considerably greater, and of the approximate order expected on the basis of control rate.

MACPHERSON, L., HUTCHINGS, M.L. and KOPELL, B.S. An electrically operated skin resistance switch. Psychophysiology 8(5): 673-675 (1971)

A touch operated switch is described that uses a simple skin resistence detection circuit. This 'isometric push-button' type switch has no moving parts, is noiseless, and absorbs the minimum of energy from the subject. It was primarily designed for psychophysiological experiments where an operant response is required.

MACPHERSON, L. and KOPELL, B.S. A zero-setter and voltage reference unit for EEG amplifier systems. Psychophysiology 9(2): 262-265 (1972)

This article describes a combined zero-setter and voltage reference unit employed by the authors in the measurement of EEG Averaged Evoked Responses. The sequential pulse generator that synchronously programs the required number of these units is outlined. The method could be of general use whenever an arbitarary zero voltage reference point or baseline is required on a signal waveform.

MAICKEL, R.P. and SNODGRASS, W.R. Physicochemical factors in maternal-fetal distribution of drugs. Toxicology and Applied Pharmacology 26: 218-230 (1973)

The time course of physiological disposition of a variety of drugs has been examined in pregnant rats using radiolabeled compounds and highly specific methods. The results indicate that the placental barrier in rats behaves as a lipoidal barrier towards positively charged and neutral drugs, while negatively charged drugs pass the placental barrier with comparative ease. Localization in fetal tissues is less pronounced that in corresponding maternal tissues for all drugs. Fetal and maternal plasma half-lives are similar for most of the compounds tested.

MARR, M.J. Sequence schedules of reinforcement. Journal of the Experimental Analysis of Behavior 15: 41-48 (January, 1971)

The performance of pigeons was studied under a second-order schedule composed of fixed-interval components, each of which was associated with a different discriminative stimulus, the stimuli occurring in a fixed order. In one condition, food presentation followed the completion of the fourth component. This was designated a fixed-ratio sequence schedule. In another condition, responses in the first component completed after a fixed time were reinforced. This was designated a fixed-interval sequence schedule. Although the stimulus order and maximum reinforcement frequency were identical under the two schedules, considerably more responding occurred under the fixed-interval sequence schedule in all components. Relatively few food presentations occurred after responding during any but the terminal components of the fixed interval sequence schedule, a feature independent of the parameter values investigated. In addition, while a pattern of increased responding between food presentations prevailed under both schedules, under the fixed-interval sequence schedule the rate in the terminal component was frequently less than in the penultimate component. The fixed-interval sequence schedule appeared to have several properties of simple fixed interval schedules.

MERLIS, S. The early clinical drug evaluation unit (ECDEU) program in the changing context of drug development and regulation. Psychopharmacology Bulletin 6(2): 93-94 (1970)

In only 10 years' growth, the ECDEU program has produced a unified instrument for coordinated research in a field as diverse as the pharmacology of behavior. It has existed and thrived during the stormiest period of therapeutic drug development. For those clinical areas not yet fortunate enough to have such a concept in operation, it has become a model for coordinated research.

FCDEU was conceived in the fruitful period of the mid-fifties, expanded during the introduction of the "me-too' therapies of the early sixties, and endured the drug drought of the late sixties. It is surviving the backlash climate of criticisms of efficacy and excessive utilization, the economic cutbacks resulting from over-reactions to public outcries against the cost of drugs and methods of dr evaluation, as well as postive concern about the ethics of conventional practi of clinical drug development.

MERLIS, S. Problems and experiences with drug trials outside the United States. Diseases of the Nervous System 35(7): 5-7 (1974)

MERLIS, S. Thioxanthenes: Discussion of the clinical investigation papers. Modern Problems in Pharmacopsychiatry 2: 113-116 (1969)

MIZOGUCHI, K. and MITCHELL, C. L. A simple method for the connection of lead wire to cortical electrodes. Psychophysiology 6(3): 378-382 (1969)

The construction of solderless connections of lead wire to screw and phonograph needle electrodes is described. The advantages of the method are: (1) the mounting of the electrodes is very easy, (2) there is no chance of breaking the connection during the insertion of the electrodes, (3) the electrodes can be easily cleaned after each experiment, and (4) the procedure results in contact of the electrode with the dura.

MORSE, W. H., HERD, J. A., KELLEHER, R. T. and GROSE, S. A. Schedule-controlled modulation of arterial blood pressure in the squirrel monkey. Experimental Psychopathology: Recent Research and Theory. Edited by H. D. Kimmel. New York: Academic Press, Inc., 1971. Pp. 147-164.

MORSE, W. H., MEAD, R. N. and KELLEHER, R. T. Modulation of elicited behavior by a fixed-interval schedule of electric shock presentation. Science 157: 215-217 (1967)

Responding elicited in the squirrel monkey by electric shocks presented every 60 seconds was gradually altered in temporal patterning, especially when the shock was also produced by responses under a 30-second fixed-interval schedule. The initially elicited pattern of maximal responding just after each shock was altered by the recurrent shock and by the added fixed-interval schedule to a pattern of maximal responding just before each shock. Most shocks were produced by responses and the response pattern was maintained for several months, but little responding occurred when shocks were omitted.

OLSEN, J.F. and KANG, S. Conformational analysis and electronic structure of acetanilide. Theoretica Chimica Acta 17: 329-333 (1970)

The calculations of the electronic structure and conformational analysis of the acetanilide were carried out using the CNDO/2 method. The results show that the endo form is 1.2 Kcal/mole more stable than the exo form. The most stable conformation of the exo isomer corresponds to the dihedral angle of 90° between the phenyl and acetamide plane, whereas the minimum energy conformation of the endo isomer corresponds to the dihedral angle 50°-60°. A comparison of the calculated and experimental dipole moments suggests also the dihedral angle of 50°-60°. A comparison with experiment indicates that this molecular orbital method is good for conformational analysis and gives electronic structure which is compatible with spectroscopic measurement. The calculated conformational analysis and electronic structure of the acetanilide are in excellent agreement with experiments.

PERT, C.B. and SNYDER, S.H. High affinity transport of choline into the myenteric plexus of guinea-pig intestine. The Journal of Pharmacology and Experimental Therapeutics 191(1): 102-108 (1974)

Kinetic analysis of the accumulation of ^{3}H-choline by innervated longitudinal muscle minces of guinea-pig small intestine disclosed the presence of two distinct choline transport systems, a high affinity component with a K_m of 2 to 4 mu-g M and a low affinity component with a K_m of 90 to 100 mu-g M. Removal of the myenteric plexus greatly reduced the velocity of choline transport at low concentrations of ^{3}H-choline. In muscle minces devoid of plexus, the high affinity choline transport component was no longer detectable, whereas the low affinity transport of choline persisted. It is concluded that the intestinal neuronal elements possess a specialized high affinity mechanism for the rapid and efficient transport of choline and its conversion into acetylcholine.

POKORNY, A.D. A scheme for classifying suicidal behaviors. The Prediction of Suicide. Edited by A.T. Beck, H.L.P. Resnik and D.J. Lettieri. Bowie, Maryland: The Charles Press Publishers, Inc., 1974. Pp. 29-44.

POLSKY, R. and SHUSTER, L. Isozymes of squid choline acetyltransferase. Federation Proceedings 32:582 (1973)

Choline acteyltransferase (ChAc) from squid head ganglia separates into multiple forms on cellulose phosphate (CP) cation exchange chromotography, polyacrylamide gel electrophoresis (PGE), isoelectric (IE) focusing, and sephadex gel filtration. The enzyme has been resolved into 2 peaks of activity (CP1 and CP2) by the use of CP. These peaks have been separated and further purified on hydroxyl apatite (75 and 300 fold respectively) to final specific activities of 540 (CP1) and 2180 (CP2) mu-moles acetylcholine produced/mg. protein/hour. These preparations differ in degree of activation by .15M NaCl (CP1 less than CP2), heat stability (CP1 greater than CP2) and extent of reactivation upon concentration (CP1 less than CP2). Antibodies specific for each CP peak have been prepared. Both antibodies inactivate both isozymes, although each is more specific for the CP peak from which it was prepared. On both PGE and sephadex, each of the CP peaks resolves into several active fractions of different molecular weights. CP1 and CP2 each separates into 3 peaks on IE focusing, with IE points of approximately 5.2, 5.7, and 6.2. The form IE at pH 5.2 is the most stable and the most highly activated by salt. The other 2 forms have lower molecular weights than, and seem to be derived from, the enzyme species IE at pH 5.2. Our results suggest the existence of 2 isozymes of ChAc in squid ganglia, each of which exists as several different size aggregates with different salt activation properties.

RANDRUP, A. and MUNKVAD, I. Relation of brain catecholamines to aggressiveness and other forms of behavioural excitation. Aggressive Behaviour. Edited by S. Garattini and S.G. Sigg. Amsterdam, the Netherlands: Excerpta Medica Foundation, 1969. Pp. 228-235.

In pharmacological experiments we have seen 2 forms of strongly hyperactive behaviour in rats: a stereotyped behaviour characterized by constant sniffing-licking-biting of cage wires and an "aggressive" or "rage" reaction characterized by vocalization and other elements of fighting.

The stereotyped behaviour is produced by amphetamine and several other stimulant drugs, while various rage reactions are produced by combinations of monoamine oxidase inhibitors with various drugs i.e., antidepressants of imipramine type and DOPA.

Both of these forms of behavioural excitation can be produced by increase of the catecholamines in the brain. Biochemical analyses show that the stereotypy can be produced by dopamine in the absence of noradrenaline, and anatomic experiments indicate an association of stereotypy with corpus striatum, the area in which the dopamine of the brain is highly concentrated.

Under certain conditions aggressive activity may be due to increased noradrenaline activity in the brain, but the most recent experiments indicate that also various other changes of the amine balance in the brain may lead to aggressive behaviour.

ROBUSTELLI, F. and JARVIK, M.E. Interaction between short and long delay intervals in a delayed matching test with monkeys. Communications in Behavioral Biology 3: 137-140 (1969)

The interactions between short and long delay intervals was studied in a delayed matching test with monkeys. The results indicate that random inclusion in the same session of short (1 sec.) and long (32 sec.) delay intervals impairs performances in the long delay intervals. Short delay intervals are not impaired.

ROSENBLITH, J.Z. Polydipsia induced in the rat by a second-order schedule. Journal of the Experimental Analysis of Behavior 14: 139-144 (September, 1970)

Drinking was studied in rats pressing a bar on a second-order schedule in which every third completion of a 1-min fixed interval was followed by food presentation. A brief flash of light signaled the completion of each fixed-interval component. The rats drank not only after the food presentations but also after presentations of the light flash alone. A high rate of steady drinking followed intervals terminated by a food presentation. Drinking that followed intervals terminated by a light flash alone was of comparable rate, but characteristically interrupted by bar pressing. When 250-mg food pellets were used instead of 45-mg pellets, both drinking and bar-pressing rates increased substantially.

ROTH, B.F. and HARVEY, J.A. Altered response of cerebral respiration to thiopental and potassium ions in vitro after septal lesions. Journal of Pharmacology 161: 155-162 (1968)

ROTH, W.T., KOPELL, B.S. and BERTOZZI, P.E. The effect of attention on the average evoked response to speech sounds. Electroencephalography and Clinical Neurophysiology 29: 38-46 (1970)

The average evoked response to pre-recorded sentences and monosyllables was studied in ten subjects. EEG recordings with electrodes at the vertex and left ear were averaged with the use of trigger pulses generated synchronously at the onset of each syllable. Two tasks were presented. In the first, the subjects were asked to listen to or to ignore certain sentences on which they were later tested for recall. In the second, they heard a list of monosyllables from which they were to distinguish nonsense words from meaningful words.

The amplitude of the evoked response to the first syllable of each sentence was approximately 8 mu-V, measuring from N_1 to P_2, whereas the evoked response to subsequent syllables was only 1.5 mu-V. A crucial factor in the size of the response may be the duration of the silence between stimuli, since the first syllable of each sentence was separated from the end of the previous sentence by a 3.5 sec pause, whereas the rest of the syllables were separated only by the much shorter pauses of continuous speech.

Attention and nonattention conditions produced differences in the wave forms that were shown by a discrimination index based on multiple cross-correlations between wave forms to be significant at the 0.01 level. These differences were idiosyncratic to the individual subject, usually appearing in the N_1-P_2 region. Sense and nonsense words could not be distinguished by this discrimination index.

SATTIN, A. Increase in the content of adenosine 3', 5'-monophosphate in mouse forebrain during seizures and prevention of the increase by methylxanthines. Journal of Neurochemistry 18: 1087-1096 (1971)

Seizures produced significant elevations of the content of adenosine 3', 5'-monophosphate (cyclic AMP) in mouse forebrain in vivo. The content of cyclic AMP doubled at 5 s and had increased four-to five-fold at 90 s after the onset of tonus. Smaller increases were observed when mice were placed in an O_2-enriched atmosphere. The increase in the content in forebrain of cyclic AMP during seizures was significantly reduced in mice that had previously been injected with theophylline or caffeine. The methylxanthines did not alter the initial (pre-ictal) level of cyclic AMP in mouse forebrain. On the basis of these and previous data, the following hypothesis is proposed to account for the present observations: When seizures produce asphyxia in the forebrain, the consequent dephosphorylation of adenine nucleotides liberates small amounts of free adenosine which may then diffuse out of cells and activate an adenyl cyclase-linked receptor that is located on plasma membranes and is accessible from the extracellular space.

SAVAGE, C., McCABE, O.L., KURLAND, A.A. and HANLON, T. LSD-assisted psychotherapy in the treatment of severe chronic neurosis. Journal of the Altered States of Consciousness 1(1): 31-47 (Fall, 1973)

This study assessed the overall effectiveness of LSD therapy vs. conventional institutional treatment of the chronic, severe neurotic and, within the LSD model, the relative effectiveness of a high vs. low dose administration. The data suggest that LSD therapy, particularly that involving high dose, had a superior short-term impact over conventional treatment in terms of objective adjustment criteria. Except for certain sex-dosage factors, differential long-term effects were either negligible or inconclusive.

SHAPIRO, D. M., FELDSTEIN, S. and FINK, M. Computer Aided Interactive Psychiatric Diagnosis Programs. New York: Biodata, Inc., 1971.

SHEARD, M. H. and AGHAJANIAN, G. K. Stimulation of the midbrain raphe: Effect on serotonin metabolism. The Journal of Pharmacology and Experimental Therapeutics 163(2): 425-430 (1968)

The midbrain of rats was stimulated electrically in the region of the dorsal and median raphe via acutely placed electrodes, and parameters of stimulation were varied. In all animals, concentrations of serotonin and 5-hydroxyindoleacetic acid were measured in the forebrain, and sites of electrode placement in the brainstem were determined histologically. Results indicated a close correlation between electrode placement and changes in indole levels in the forebrain. Only in those regions of the midbrain with serotonin-containing neurons did stimulation produce an increase in serotonin catabolism. There was a maximum change at a stimulus frequency of 10 pulses/sec. This amounted to a fall in serotonin of 18% and a rise in 5-hydroxyindoleacetic acid of 80% with 1 hr of stimulation. The fall in serotonin reaches a maximum in the first 15 min. Thereafter, the concentration of serotonin does not change, while 5-hydroxyindoleacetic acid continues to rise. The fact that the serotonin concentration remains constant beyond 15 min, despite continued stimulation, suggests that there has been an upward adjustment in the rate of serotonin biosynthesis.

SHEPPARD, C. and MERLIS, S. Pragmatic considerations of current models in the predictors of psychiatric drug effects. Diseases of the Nervous System 30: 11-14 (February, 1969)

SHEPPARD, C., O'NEILL, C., FRACCHIA, J. and MERLIS, S. Levels of personal conflict derived from response to the emotion profile index. Journal of Psychology 74: 143-148 (1970)

Kellerman and Plutchik, reporting on one aspect of the relationship between personality and emotion -- namely, conflict -- propose a taxonomy of trait terms designed to measure high, medium, and low conflict tendencies from EPI responses. Hypothesizing that a person's choices among these terms reflect levels of maladjustment, Kellerman and Plutchik present data indicating normal Ss, moderately ill, and severely ill Ss obtain significantly different scores on each of the three conflict scales derived from the trait term taxonomy. Their findings show normals scored higher than the two maladjusted groups on the low conflict scale, while the greatest medium conflict scores and high conflict scores were achieved by the moderately ill and severely ill groups respectively.

The present study seeks to extend EPI conflict research by applying Kellerman and Plutchik's conflict measures to the EPI responses of MMPI identified pathological personality types which clinically suggest varying degrees of conflict. In this way additional information as to the relative sensitivity of these newly developed conflict scales to expected differences in the level of conflict associated with different personality structures can be obtained.

SIEGEL, L. Digitizing graphic records for computer analysis. IEEE Transactions on Bio-Medical Engineering BME-14(1): 7-10 (January, 1967)

A method for digitizing graphic records is presented. First the TRACER is described. This electromechanical device is used on-line with a digital computer (LINC) having analog-to-digital input channels. As the stylus on the TRACER is moved over the record to be digitized, its position is indicated by a unique set of resistance values. These are converted to voltages which are forwarded to the computer as (X, Y) coordinate values. The computer stores these values, operates on them and displays the converted record on an on-line oscilloscope. Associated computer programs are discussed as well as applications. A section on errors and a comparison with presently available methods in included.

Student Association for the Study of Hallucinogens, Inc. Doping: A STASH literature review. Grassroots (June, 1973 supplement)

SULLIVAN, R. Magnitude estimation of anxiety. Psychonomic Science 21: 209-211 (1970)

Twenty-six males rated and estimated magnitudes of anxiety experienced during a stress condition. The findings suggest that the direct method of magnitude estimation is an appropirate scaling procedure for the measurement of transitory anxiety. Taylor MAS scores were not related to anxiety levels expressed on either category or estimation scales. The method of direct estimation of anxiety may serve as a corollary to other measures of transitory anxiety and prove useful in behavioral therapy settings.

TAYLOR, R.M., DREW, W.G. and MILLER, L.L. A simple method for modifying a standard activity wheel to increase sensitivity. Perceptual and Motor Skills 33: 1317-1318 (1971)

A simple and highly sensitive method of automating the acquisition of activity wheel data on animals in isolation is described. As well as being inexpensive and quickly constructed the modification is entirely maintenance free.

THOMPSON, T. and SCHUSTER, C.R. Behavioral Pharmacology. Englewood, New Jersey: Prentice-Hall, 1968.

For abstract, see Section IV. Behavioral Studies.

THOR, D.H. and GHISELLI, W.B. Visual and social determinants of shock-elicited aggressive responding in rats. Animal Learning and Behavior 2(1): 74-76 (1974)

Light and dark reared, social and isolate housed, male Long-Evans hooded rats were tested in bright and dim light for aggressive response to footshock. Test lighting and socialization main effects were significant, with greater fighting in dim light than in bright light and greater fighting by isolates than by socially housed animals. Test lighting interacted with prior visual experience and socialization interacted with past and present illumination variables. The results suggest an inhibitory effect of test illumination dependent upon prior social and visual experience.

VACHON, L., MIKUS, P., MORISSEY, W., FITZGERALD, M. and GAENSLER, E. Bronchial effect of marihuana smoke in asthma. Proceedings of the National Conference on Marihuana (in press)

For abstract, see Section III. Mechanisms of Action of Different Drugs.

VENATOR, E.R., UEHLING, B.S. and ISAAC, W. Effects of illumination and white noise on the rate of electrical self-stimulation of the brain in rats. Psychological Reports (in press)

WEISS, B. Can computers answer behavioral questions? Behavior Research Methods and Instrumentation 5(2): 67-79 (1973)

I have tried to document my assertion that computer technology has made a contribution to our understanding of behavior and that it can be used both to ask and answer important questions about behavior and about behavioral pharmacology. Obviously, the technology is going to be developed further, be made available more cheaply, and made easier for us to use. I am happy to see such developments, but we surely do not have to await the perfect system in order to do significant research on behavior.

WEISS, B. Digital computers and the microanalysis of behavior. Digital Computers in the Behavior Laboratory. Edited by B. Weiss. New York: Appleton-Century-Crofts, 1973. Pp. 99-140.

I have tried to present the reader with a point of view about the use of computers in behavior as well as some possible useful techniques. This point of view was shaped by my experience in the LINC evaluation program, and by events and experiences in our work since then. I aimed to stress two main points. First, the digital computer is an elegant experimental tool. Although it is of great utility in large scale drug screening, for example, I believe its most important contribution will be to put behavior under a microscope -- to provide more profound analyses and finer control than has ever been possible before. Second, I believe that behavioral scientists should equip themselves as well as possible to understand computer technology and, especially, programming. The program is the experiment to such a great extent that much of the potential of computer technology can be lost by scientists who fail to equip themselves with the necessary skills.

WEISS, B., editor. Digital Computers in the Behavior Laboratory. New York: Appleton-Century-Crofts, 1973.

Computer technology will have a two-fold impact on behavior research. First, it makes possible, because of the ability of the computer to acquire and store data, a microanalysis of behavior. Even conventional reinforcement schedules demonstrate new features when such analyses are possible. Second, it enables the experimenter to exert direct control over elements of behavior that could be controlled only indirectly earlier. The latter contribution of computer technology to the behavior laboratory will surely be its most revolutionary one.

WEISS, B. The fine structure of operant behavior during transition states. The Theory of Reinforcement Schedules. Edited by W.N. Schoenfeld. New York: Appleton-Century-Crofts, 1970.

WEISS, B. Instrumentation for operant behavior research. American Psychologist 24(3): 255-258 (March, 1969)

WEISS, B., LATIES, V.G., SIEGEL, L. and GOLDSTEIN, D. A computer analysis of serial interactions in spaced responding. Journal of the Experimental Analysis of Behavior 9(6): 619-626 (November, 1966)

Serial dependencies in interresponse times were studied by means of a digital computer. In monkeys exposed to a DRL 20-sec schedule of reinforcement, serial interactions appeared at all stages of training. Early in training the serial effects consisted of trains of relatively long interresponse times interpersed among trains of relatively short ones. Later on, the serial effects appeared to be characterized by a tendency to drift up and down in long wave-length periods around the minimum interval required for reinforcement. After training to a point at which most interresponse times produced reinforcement, serial effects of a still more subtle nature appeared. These effects were made apparent by autocorrelation and power spectrum methods and consisted of both long-term and extremely short-term fluctuations in interresponse times.

WEISS, B. and SIEGEL, L. The laboratory computer in psychopathology. Methods in Psychopathology. Edited by C.C. Brown. Baltimore, Maryland: Williams and Williams, 1967. Pp. 459-487.

WERNER, G. Neural information processing with stimulus feature extractors. The Neurosciences, Third Study Program. Edited by F. Schmitt and F. Worden. Cambridge, Massachusetts: MIT Press, 1973.

The complex stimulus properties to which certain classes of neurons are sensitive fall into two broad categories: One, consisting of movement or temporal modulation of stimuli; the other, representing stationary spatial patterns. The comparison between stimulus feature-sensitive neural mechanisms in the visual and the somesthetic system suggests that the stimulus features reflecting movement and change of stimuli play a role in directing the receptor sheet to positions relative to the stimulus object, which enable other feature detectors to respond to their appropriate stationary patterns. This conception emphasizes the serial aspect of information acquisition in perception: Each sample of stationary sense impressions would in this view be the result of neural activity in many sensory channels in parallel, and these samples would be acquired by movement of the receptor sheet into successive positions under guidance by neurons that signal stimulus motion and change. There is some evidence that this form of conjoint activity of motion and pattern-sensitive feature detectors would generate successions of sense impressions in a form suited for the encoding of spatial representations of stimulus objects.

WERNER, G. The topology of the body representation in the somatic afferent pathway. The Neurosciences, Second Study Program. Edited by F.O. Schmitt. New York: Rockefeller University Press, 1970. Pp. 605-617.

WERNER, G. and WHITSEL, B.L. Topology of the body representation in somatosensory area I of primates. Journal of Neurophysiology 31: 856-869 (1968)

The projection of the hindlimb to the somatosensory area I of the macaques and squirrel monkeys was studied with microelectrode penetrations oriented parallel or perpendicular to the cortical surface.

The essential features of the cortical map obtained from a composite of all 43 histologically identified penetrations of this study area, the representation

Werner, G. and Whitsel, B.L. Topology of the body representation . . . continued of the dermatomes in serial order, the separation of sole and dorsum of the foot in the map with the lateral edge of the foot adjoining the postaxial calf and the medial edge bordering on the preaxial calf, and the continuity between dorsum and sole maintained by a nearly diagonal band of neurons representing the tips of the toes.

Relations of proximity and distance of points on the body do not consistently remain preserved in the cortical map. On the other hand, there are certain arrays of first-order afferent fibers at the dorsal root entry zone which project in toto to corresponding arrays of cortical neurons: the RFs of these arrays compose the "dermatoman trajectories" which we characterized in an earlier study. Each dermatomal trajectory is treated in the projection as a unit. Accordingly, the body and its cortical map are topologically equivalent in this sense: two adjacent peripheral RFs that form part of one trajectory remain neighbors in the cortical projection. However, neighboring RFs that belong to different trajectories need not always be neighbors in the cortical Map; they are not if their afferents enter the spinal cord at different segumental levels.

WERNER, G. and Whitsel, B.L. The topology of dermatomal projection in the medial lemniscal system. Journal of Physiology 192: 123-144 (1967)

1. The topographic organization of first order afferent fibres in the lumbar, sacral and coccygeal dorsal roots, and in the fasciculus gracilis was studied in squirrel monkeys.

2. At the entry zone, progressing from caudal to rostral, dorsal root filaments receive fibres from tail and hind-limb receptive fields which serially overlap and describe a spiral-shaped trajectory. The latter starts with tail, progresses post-axially towards the foot, crosses the foot from lateral to medial, and ascends the preaxial leg.

3. In the fasciculus gracilis, this arrangement of fibres at the dorsal root entry zone is preserved in its entirety. It assumes the form of a fibre lamination, with the most caudal dorsal root fibres occupying a dorso-medial location; further rostral dorsal root fibres come to lie more ventrolaterally.

4. Dorsum and sole of foot project in an overlapping and interdigitating manner to the fibre lamina of the 7th lumber dermatome in the fasciculus gracilis. Therby, dorsum and sole of foot behave in the projection as if they were one and the same surface.

5. The argument is presented that the foot and its projection on to the cross-sectional plane of the dorsal funiculus are topologically equivalent and that the hind-limb as a whole and its projection are not. On the other hand, homotopic mapping of the foot together with the sequential fibre organization in the dorsal funiculus enable many more types of closed curves on the body surface to remain arc-wise connected in the projection than would otherwise be possible.

WERNER, G., WHITSEL, B.L. and PETRUCELLI, L. Data structure and algorithms in the primate somatosensory cortex. Brain and Human Behavior. Edited by A. Karczmar and J.C. Eccles. New York: Springer Verlag, 1972. Pp. 164-186.

WHITSEL, B.L., ROPPOLO, J.R. and WERNER, G. Cortical information processing of stimulus motion on primate skin. Journal of Neurophysiology 35(5): 691-717 (1972)

WILK, S. Cerebrospinal fluid levels of MHPG in affective disorders. Nature 235 (5339): 440-441 (February, 1972)

WOFSEY, A.R., KUHAR, M.J. and SNYDER, S.H. A unique synaptosomal fraction, which accumulates glutamic and aspartic acids, in brain tissue. Proceedings of the National Academy of Sciences 68(6): 1102-1106 (June, 1971)

Subcellular fractionation of rat cerebral cortical slices on sucrose density gradients provides evidence for the existence of a unique synaptosomal fraction (enriched in pinched-off nerve endings) that selectively accumulates glutamic and aspartic acids. The particles in this fraction sediment to a less dense portion of sucrose gradients than do particles that accumulate aromatic, basic, and neutral (large and small) amino acids. Particles that store gamma-aminobutyric acid are even less dense than those that contain exogenous glutamic and aspartic acids. The distribution of endogenous glutamic acid encompasses both that of exogenous glutamic acid and that of the neutral and basic amino acids. These findings provide neurochemical support for the suggestion that glutamic and/or aspartic acid has a specialized synaptic function, perhaps as a neurotransmitter, in the mammalian brain.

WOLPERT, A. Psychopharmacology: An overview. Psychiatric Quarterly 42: 444-451 (July, 1968)

WOLPERT, A. and DIAMOND, B. Preclinical factors as predictors of initial human dose. Diseases of the Nervous System 30: 19-22 (February, 1969)

WOLPERT, A., QUINTOS, A., WHITE, L. and MERLIS, S. Thiothixene and chlorprothixene in behavior disorders. Current Therapeutic Research 10(11): 566-569 (November, 1968)

Thiothixene, a thioxanthene with a piperazine side chain and a sulfonamide at position 2, has been shown to be effective in a wide variety of adult psychiatric disorders. There has also been evidence of its efficacy in certain severe childhood disorders. Chlorprothixene has been used for many years in children. A comparative study was undertaken to determine if side chain differences offered target symptom specificity between these thioxanthene structures.

WOLPERT, A., SHEPPARD, C. and MERLIS, S. An early clinical evaluation of clopenthixol in treatment-resistant female schizophrenic patients. American Journal of Psychiatry 124(5): 702-705 (November, 1967)

Some published results from the European literature regarding the therapeutic and untoward effects of clopenthixol therapy were replicated. Therapeutic response was demonstrated at a daily dosage of 50 mg. An initial drowsiness was noted within a few days of therapy. No laboratory abnormalities were noted.

The global impressions of the ward physician were confirmed by the statistical evaluation of the rating data. A significant improvement was demonstrated in this sample of treatment-resistant, chronic female schizophrenics. This has encouraged us to formulate a further, more extensive investigation of clopenthixol in a larger double-blind comparative study.

WOLPERT, A., SHEPPARD, C. and MERLIS, S. Thiothixene, thioridazine, and placebo in male chronic schizophrenic patients. Clinical Pharmacology and Therapeutics 9(4): 456-464 (July-August, 1968)

The population of a male chronic schizophrenic ward was selected for treatment with thiothixene (Navane) (35 subjects), thioridazine (Mellaril) (29 subjects), and/or placebo (28 subjects). Medication was administered for seven months. During this period, the maximum daily dosage reached was 55 mg. of thiothixene and 1,100 mg. of thioridazine. Because of the high incidence of untoward effects and the absence of a marked therapeutic effect, daily dosage was titrated to an average of 10 mg. of thiothixene and 200 mg. of thioridazine during the last four months of treatment. On the basis of the fivefold criteria for determining efficacy (statistical comparisons of the behavioral ratings, psychological test data, the number of treatment failures in each medication group, and the incidence of side effects and patient status at the close of the study), thioridazine appeared slightly more effective in the treatment of schizophrenic symptomatology in this series of patients.

WOLPERT, A., YARYURA-TOBIAS, J.A., WHITE, L. and MERLIS, S. Triiodothyronine and phenothiazines in schizophrenia. Diseases of the Nervous System 30: 487-489 (July, 1969)

Twenty chronic schizophrenic patients on various phenothiazines were matched and assigned to placebo and triiodothyronine. After one month there was no difference between the two treatments. Triiodothyronine did not have a synergistic effect on phenothiazine controlled psychotic symptoms.

WOOD, R.W. A student-maintained filing and scheduling system for the interview classroom technique. The Psychological Record 22: 491-496 (1972)

A filing system was devised to facilitate the implementation of the interview technique, as well as other personalized systems of instruction. All file maintenance was performed by the students themselves, freeing instructors and teaching assistants for more valuable functions. The contingency management system maintained a constant rate of interview taking. Instructors and teaching assistants gave interviews at a negatively accelerated rate throughout the course, with a short burst in the last week. A significant negative correlation was demonstrated between the frequency of interviews given per student and the number of class days taken to complete the course.

WOOD, R.W., SETTE, W.F. and WEISS, B. Interfacing the experimenter to the computer: Languages for psychologists. American Psychologist (in press)

WORTHINGTON, C.S. and ISAAC, W. Occipital ablation and retention of a visual conditioned avoidance response in the rat. Psychonomic Science 8(7): 289-290 (1967)

Retention of a preoperatively established light contingent avoidance response following bilateral occipital ablation was studied. The two variables of interest, level of preoperative training and duration of postoperative recovery period, had a significant effect upon postoperative retention.

YOUNG, A.B., OSTER-GRANITE, M.L., HERNDON, R.M. and SNYDER, S.H. Glutamin acid: Selective depletion by viral induced granule cell loss in hamster cerebellum. Brain Research 73: 1-13 (1973)

Cerebellar hypoplasia in the hamster induced by rat virus strain PRE 308 was used as a model system in which greater than 95% of the cerebellar granule cell population can be selectively depleted at an early stage of development. Electron microscopic examination of infected hamster cerebella indicated a significant reduction of parallel fiber synapses and granule cell dendrites in glomeruli. All other cell types occurred in approximately normal numbers and formed proper synaptic connections.

To attempt to identify the transmitter of the cerebellar granule cell, we examined the uptakes of amino acids and amines into synaptosomes in the cerebella of hamsters with granuloprival cerebellar hypoplasia and their littermate controls. The high affinity uptakes of glutamic and aspartic acids were reduced by 70% in infected animals. No significant reductions occurred in the uptakes of a variety of other amino acids, putative neurotransmitters and their precursors. Endogenous glutamic acid was decreased by 43%, although endogenous protein concentration was not altered. Analysis of the free cerebellar amino acid content of infected animals revealed a selective decrease in glutamic acid and no decrease in other amino acids, in particular aspartic acid. Partial granule cell depletions were also produced and the extent of granule cell loss correlated with the decrease in endogenous glutamic acid and high affinity glutamic acid uptake.

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