Mood, Behavior, and Drugs

AAAS Symposium

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Photo by Beri Rothschild Lange, New York City

There is widespread individual and social anxiety regarding drugs. This mood frequently results in erratic and inconsistent behavior, both individually and socially. In order to have a satisfactory understanding of the use and misuse of drugs in our society, it is essential that there be a basic understanding of psychological factors involved in mood and behavior, as well as pharmacological information regarding the action of drugs.

Evidence is now accumulating from psychopharmacologists and neurophysiologists in various parts of the world that mood and behavior are determined, in part, by the activity of cell centers in the limbic system and hypothalamic areas of our brainstems. As summarized by Paul D. MacLean (National Institute of Mental Health), two major cell centers are involved. One center has to do with self-preservation and concerns the search for and intake of food, while the other has to do with species preservation and is involved in the drive for sex. Food intake centers seem to be regulated by a "glucostat," while the sex drive centers are probably regulated by a more complex internal metabolic buildup of various ions, which lead progressively to increasing polarization and resulting cellular activity. When the glucostat shuts off in the food intake centers, there is a feeling of satisfaction, with muscular relaxation and often sleep. When there is completion of sexual activity, with orgasm, there is usually a feeling of satisfaction, with relaxation and often sleep. The sense of satisfaction in both instances may be conditioned in a variety of ways depending upon the life experiences of different individuals. As a result of the conditioning process, individuals seek satisfaction. Many drugs can give a feeling of satisfaction, including muscular relaxation and sleep.

The drive for the mood of conditioned satisfaction is a powerful one. If drugs are found, on individual trial, to give this feeling, such drugs will be sought, and used, and often misused, as a result of ignorance or indifference to the harm such misuse may cause. The mood of dissatisfaction is also powerful and unpleasant. People seek to get away from it in many ways, including overeating, sexual excess, and drugs.

The psychodynamism of dissatisfaction may lead to disaster, individually and socially. When an individual realizes that there is a possibility of not getting the satisfaction which may be desired in connection with any particular goal or any purpose in general, there may be a feeling of anxiety. If not too great, this may aid in further endeavor to achieve the goal. On the other hand, when an individual realizes that there is a probability of failing to get the satisfaction desired, there is frustration. At this point, a peculiar psychological factor intervenes. A frustrated individual usually focuses the frustration upon some other person, usually near and often dear. This innocent individual gradually becomes the object of resentment, hostility, and antagonism. With increased buildup of the psychological factors involved, the focusing of frustration may go on to hatred and to vengeance. The mood may blow off in anger. If, however, the mood is contained and psychological buildup continues, it may result in rage. This focusing of frustration may occur between parents and children, students and teachers, workmen and bosses or in any hierarchal situation.

Drugs perform no miracles. They can merely make living material do more or less what it is already capable of doing. The active agent in any drug is chemical. The activity of a drug occurs at a molecular level—when the molecules of a drug interact with the molecules of living material. The intensity of drug action is dependent upon dosage (mass of chemical per mass of living material)—on the ratio between the rate of absorption of the drug into, and the rate of its removal from, the living material involved; the physicochemical properties of the drug; and then the peculiar individual characteristics of the living material under consideration. This factor varies enormously, and is dependent upon age, sex, metabolic state, allergic tendency, pathological condition, and homeostatic factors. Because of this variation, there is a wide difference in the action of drugs on individuals. Gaussian distribution occurs in the response of people to the same dose of the same drug: some persons may show no effect at all, while the response in others may be very great, even death. There is even greater variation in the response to repeated administration than to a single dose. In general, intravenous injection of a solution of a drug will cause a much greater wallop than when taken by mouth. Some people want this effect. Although the activity of a drug begins at a molecular level, it moves in a domino fashion to subcellular units, to cells, to organs and tissues, to individuals, to societies, and to ecologies.

Drugs acting on the brain and central nervous system are of three kinds: (i) those which will stimulate and increase the activity of the brain and central nervous system; (ii) those which will depress such activity; and (iii) those which will distort such activity. Among the stimulants to the central nervous system are drugs, which may be commonly abused, such as the amphetamines, cocaine, and caffeine. These drugs increase muscle tension and activity of the central nervous system and give a feeling of being able to surmount any difficulty and to rise above an unpleasant environment. Drugs which act as depressants on the central nervous system are the opiates, the tranquilizing agents, the barbitals, chloral, alcoholic beverages, the anes-

thetic agents, and even aspirin. Such drugs tend to produce muscular relaxation, general depression of brain activity, and often cause sleep. They give a sense of relaxed and of satisfied well-being, and often this is sought among individuals who are frustrated in the midst of an unsatisfying and unpleasant environment. The distorting drugs are the hallucinogenic agents and include LSD, psilocybin, and many indole compounds. Cannabis, or marijuana, does not readily fall into any of these three classifications. It is a mild euphoric. It does produce changes in the central nervous system. Use of it mostly leads to relaxation and a feeling of well-being, but includes reduced vision, an enhanced sense of touch, and reduced interest or attentiveness to surroundings.

All the mood-altering drugs are capable of abuse. In the continual search for satisfaction, many people try many different kinds of drugs and find those which may be suited to their particular individual situation. Many of the opiates are addictive, in the sense that they promote physical dependency. This is what leads to difficulty under the conditions of attempted social regulation.

A feature of the annual AAAS meeting to be held in Chicago, 26–31 December 1970, is a symposium on Mood, Behavior, and Drugs. The psychosocial aspects of drugs use and misuse are attracting much concern, not only in the United States but in many other areas as well. Many misconceptions regarding drug use and abuse are held by the general public, and there is often strong emotional feeling regarding drug use. In an effort to provide sound scientific material for public understanding of drug use and misuse, a broad interdisciplinary symposium is being arranged for 27–28 December 1970, with the cooperation of AAAS sections on Medicine, Pharmacy, Psychology, and Sociology.

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Speakers and Topics

27 December (morning)

Introduction: Neuropharmacological Factors in Relation to Limbic System and Hypothalamic Cell Centers, C. D. Leake (University of California, San Francisco).

Psychosocial Use of Drugs, Richard Hormon (Illinois Institute of Technology, Chicago).

The Problem of Youth and Alienation, Allan M. Fox (Temple University, Philadelphia).

Drug Problems of Students, Roswell Johnson (Brown University, Providence, Rhode Island).

Psychosocial Factors in Drug Misuse, Edwin Lipinski (Simon Fraser University, Burnaby, British Columbia, Canada).

Addictive Drugs, Theodore Rothman (University of Southern California, Los Angeles).

27 December (afternoon)

Introductory Comments on Drug Misuse, H. W. Elliott (University of California, Irvine).

Neurochemistry and Human Behavior, Joel Elkes (Johns Hopkins Hospital, Baltimore, Maryland).

Social Implications of Psychoactive Drugs, Frank Berger (Wallace Laboratories, Cranbury, New Jersey).

Perception and Hallucination, Roland Fischer (Ohio State University, Columbus).

Alcohol in Relation to Mood and Behavior, Samuel C. Kaim (Veterans Administration, Washington, D.C.).

Alcohol and Cannabis, Edward Truitt (Battelle Memorial Institute, Columbus, Ohio).

Panel Report on Action of Marijuana, E. Barnett, Harold Goolishian, Gene Samuelson, and Robert White (University of Texas Medical Branch, Galveston).

28 December (morning)

Introductory Comments: Chemical Factors in Brain Activity, Harold Himwich (State Hospital, Galesburg, Illinois).

Drug Subcultures, David E. Smith (University of California, San Francisco).

The Methadone Treatment of Opiate Addiction: Facts and Opinions, Elton McCawley (University of Oregon, Portland).

Aggression in Relation to Drug Use, Alexander Karczmar (Stritch Medical School, Hines, Illinois).

Psychophysiological Effects of Biogenic Amines, Hector Sabelli (Chicago Medical School, Chicago).

Biogenic Amines in Relation to Physical Dependency on Drugs, E. Leong Way (University of California, San Francisco).

Social Factors in Drug Misuse, Frank Ayd, Jr. (Taylor Manor Hospital, Ellicott City, Maryland).

28 December (afternoon)

Introductory Comment: Psychoactive Drugs, Daniel Efron (National Institute of Mental Health, Bethesda, Maryland).

Antidepressant Drugs, Nathan Kline (State Hospital, Orangeburg, New York).

Time Factors and Brains, Henry Wisniewski and R. D. Terry (Albert Einstein Medical School, New York City).

Biomedical Aspects of L-*Dopa*, Frederick K. Goodwin (National Institute of Mental Health, Bethesda, Maryland).

Mental Effects of Therapeutic Drugs Used for Nonpsychiatric Effects, Leo Hollister (Veterans Hospital, Palo Alto, California).

Chemistry of Reward and Punishment, Larry Stein (Wyeth Laboratories, Radnor, Pennsylvania).

Public Policy on Misuse of Drugs, Sidney Cohen (Los Angeles, California).

Summary, Joel Fort (El Cerrito, California).