

health policy in the United States, Mechanic is not so much interested either in delineating historical trends or in characterizing existing policy as he is in analyzing the issues that any coherent policy must confront. The most striking recent change in policy is that suggested at the beginning of this review, the more limited use of the mental hospital. The rate of hospitalization has not markedly declined but the duration of confinement has. Patients are being returned home once the acute phase of disorder has subsided. Outpatient services have enormously increased in the last 20 years. Nevertheless, their role in preventing hospitalization is not entirely clear. There is no question but that even schizophrenic patients in the acute phase of disorder *can*, for the most part, be maintained in the community with the use of tranquilizers and home visits, but the burden placed upon their families may be extremely taxing. Outpatient services may permit some patients to avoid breakdown and may help others to function more effectively after a brief period of hospitalization. There is no reason to expect that we can do away with mental hospitals, but we are learning to use them selectively.

During the past decade, mental health planning in the United States has been dominated by the model of the community mental health center offering emergency and in- and outpatient services for the acutely mentally ill along with educational and consultational services, all presumably tailored to the needs of a specified local population. Ironically, efforts to transcend the limitations of the medical model of mental illness sometimes serve to turn highly trained psychiatrists away from the care of the mentally ill toward concerns in which their competence is far less impressive. Mechanic sees much benefit in the use of community centers as means of integrating diverse services, but notes with apprehension the grandiosity of some psychiatrists who view the community mental health center as a potential seat of psychiatric control over the human problems of a population.

In a particularly thoughtful chapter, Mechanic examines legal aspects of social policy relating to mental illness, especially commitment procedures, the judgment of competency to stand trial, and the insanity defenses. The proportion of voluntary admissions to mental hospitals has increased greatly, but many patients are still legally com-

mitted against their wishes. Mechanic cites recent research which establishes beyond a doubt that commitment proceedings often do not adhere to legal requirements for depriving the individual of his liberty. Hearsay complaints against the person may be accepted at face value; the decision to commit is a probable outcome *unless* the prospective patient is represented by counsel. The interests of the community will probably continue to demand mechanisms for containing the more deviant manifestations of mental illness, but Mechanic suggests the need for continual assessment to insure that such procedures will be as humane as possible. This is equally true when a person charged with a crime is found incompetent to stand trial and is then sent to a mental hospital. Many have spent the rest of their lives in the hospital, despite the fact that they could have been returned for trial within a short time.

Mechanic writes from a sociological perspective, but not narrowly so. He is critical of those sociologists who have categorically damned the mental hospital without considering the needs of distressed patients and their families. He argues for more attention to the chronic patient and for efforts to develop more largely educational approaches to rehabilitation. There is a need for linking the new community facilities to the hospitals for longer-term care. He notes that much more attention needs to be given to providing help for the aged in a variety of contexts.

The range of topics touched on in the brief compass of this volume results in occasional feelings that one is flitting on too quickly when it might be desirable to explore at greater length. There is little that is new in the perspectives that are presented, but much merit in the way that they are juxtaposed and their implications explored. Recent efforts to develop community programs that do some of the very things that Mechanic advocates are not discussed, nor is there adequate consideration of the potentials of new categories of mental health personnel. Nevertheless, Mechanic has an impressive command of relevant knowledge, and his thoughtful formulation and analysis of issues make this an excellent point of departure for the examination of mental health policy.

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## The Sense of the Body

**Perceptual and Cognitive Aspects of Body Experience.** FRANKLIN C. SHONTZ. Academic Press, New York, 1969. xii + 254 pp., illus. \$11.

This book has three clearly stated purposes: first, to provide a general survey of research and theory on perception of the personal body; second, to report the author's research on body perception; and third, to clarify key issues in the study of body perception.

The author has adequately achieved his first purpose, and this book provides the only survey of this kind since Schilder's *The Image and Appearance of the Human Body*, published in 1935. A useful distinction is made between the tradition of research that took its inspiration from Henry Head's concept of the body schema and has been concerned with the perception of body parts, particularly in neurological patients, and that other tradition, the body-image tradition, which has been concerned with the relation between body percepts and personality traits and which is typified in the work of Schilder. The literature in both traditions is reviewed and the conceptual and methodological weaknesses in both are revealed. It is particularly refreshing to see a critical review of the extremes of theoretical obscurantism which have been manifest in the body-image tradition. This part of the book is recommended as a most useful and sane review of the subject.

The part of the book in which the author's own work is reviewed makes dull reading. Subjects were asked to estimate the sizes of certain parts of the body under a variety of stimulus and response conditions. Certain patterns of over- and underestimation were found which were stable under various conditions. However, the conclusion from these data is that "there is yet no adequate explanation for the specific form assumed by the pattern of error scores for body parts." After this, one's interest in such material inevitably flags, although the particular experimental methods may interest those who are working in this field. The chapter on correlational investigations is even more boring; one's interest flags to zero when one reads, "This procedure yielded a total of 270 statistical tests, of which 16 (or about 6%) were significant at the .05 level."

The third purpose of the book is only partly achieved, and the final

theoretical overview is not a convincing exposition of the importance of research in this area. Perhaps the most important and interesting aspect of the body schema concept is that by which it is seen as the internalized organization of the mobile body which underlies the ability to coordinate movements in simple and complex skills. This aspect is barely hinted at in this volume.

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## Plant Products

**The Biochemistry of Alkaloids.** TREVOR ROBINSON. Springer-Verlag, New York, 1968. x + 152 pp., illus. \$9.75. Molecular Biology, Biochemistry, and Biophysics, vol. 3.

The presence of alkaloids in plants commands attention. Their startling effects on man and animals are something we have lived with throughout history, and at times must have turned history's course significantly. Yet within the plants which make them the alkaloids seem to produce no outstanding effects. We have had ample time to make their acquaintance, for it was at the beginning of the last century that alkaloids were isolated and shown to be the quintessences of such drugs as opium and cinchona. Since then the search for other alkaloids from plants has been prosecuted with great diligence and in recent years has been accompanied by an equally diligent and more sophisticated investigation of the chemical structure of alkaloids. But the question still remains whether these interesting dynamic substances have any particular role to play in the economy of the plant producing them. Robinson's book is concerned mainly with this question; as he points out, there are a number of other books which deal quite thoroughly with the occurrence, isolation, structure, and characteristics of alkaloids. This book deals mainly with how alkaloids are built up in the plant (biosynthesis) and whether they are utilized or degraded by further metabolic processes. Obviously this sort of information is necessary before the question of function in the plant can be settled. Biosynthesis is an aspect of the alkaloids that has been particularly studied during the last few decades, and the

bulk of the book is devoted to this topic. In fact, apart from anything else, this book is an excellent, comprehensive yet compact discussion of this subject. It also includes as much biochemical information as is available. The general theories of alkaloid biosynthesis are discussed, and this discussion is followed by detailed consideration of alkaloids grouped according to their basic chemical structure (pyridines and pyrrolidines, tropanes, isoquinolines, morphinans, indoles, terpenoids, and so on). Two interesting chapters on the metabolism of alkaloids by bacteria and animals and on the biochemical pharmacology of alkaloids balance out the coverage.

The survey clearly shows that knowledge of biochemical aspects such as the enzymology of biosynthetic processes is still rudimentary; similarly, we are a long way from having a satisfactory explanation of function. The most obvious guess, that alkaloids impart survival value by protecting the plant from overgrazing by animals, meets with the answer that many alkaloid-containing plants are eaten by animals. In fact (p. 49), certain aphids are so anxious to get at the alkaloids of the broom plant that they will crowd round and suck the parts richest in alkaloids, and I myself have seen a flock of goats in the Sudan vigorously devouring the very poisonous leaves of *Datura metel* and *Argemone mexicana*.

More precise information, however, suggests possible roles in individual plants. For example, relationships have been found between certain alkaloids and pyridine nucleotides (p. 29) and between tomatine and growth hormones in the tomato plant (p. 5), and studies of the conversion of alkaloids such as nicotine (p. 34) and morphine (p. 69) to other compounds in the plants producing them suggest a metabolic role for these substances, as do the rapid changes in the alkaloidal patterns of *Catharanthus roseus* and *Conium maculatum* (p. 5).

In the light of the shift in emphasis in the study of secondary products in plants, I think this book is timely, and the incorporation of the all too scanty information on the biochemical aspects justifies its title.

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## Biogenesis

**Chemical Evolution.** Molecular Evolution towards the Origin of Living Systems on the Earth and Elsewhere. MELVIN CALVIN. Oxford University Press, New York, 1969. x + 278 pp. + plates. Cloth, \$9; paper, \$4.50.

It is generally believed that life began on the earth sometime between 4.5 and 3.5 billion years ago. The first step in this process was the synthesis of simple organic compounds from the constituents of the reducing atmosphere. This was followed by the polymerization of these simple compounds, and finally by the organization of the polymers into a self-replicating structure. This sequence of events is sometimes called chemical evolution, although it is not evolution in the Darwinian sense, inasmuch as reproduction, mutation, and selection are not involved before the first living organism arises. There has been considerable experimental investigation in this area in the last 20 years, and the author of this book has made substantial contributions to the field. This book summarizes his view of the subject.

The first section of the book deals with the fossil record. There is a brief discussion of Post-Cambrian fossils and a detailed discussion of the Pre-Cambrian microfossils that have been found by Barghoorn and Schopf in cherts from the Bitter Springs, Gunflint, and the Fig Tree formations. An excellent addition to the book is five color plates showing samples of these Pre-Cambrian rocks; all these rocks would look about the same in black-and-white photographs. The next section, amounting to almost a third of the book, is an extended discussion of hydrocarbons and fatty acids found in present-day organisms and in rocks. Although this is an interesting subject, it does not tell us much about how life began. This section might well have been extended and made into a separate book.

The primitive reducing atmosphere and the sources of energy available for organic compound synthesis are taken up next, and the experiments synthesizing organic compounds under primitive earth conditions are then reviewed. From the standpoint of a worker in the field this section is too short, but for the average reader it is a good summary.

The story continues with the prob-