that puts its author and the young rebels on different planes, between which lies the generation gap.

The reviewer sees as the other kind of weakness in Etzioni's major theoretical stance the use of basic concepts and the formulating of propositions that are extraordinarily difficult to operationalize and test. This kind of problem has preoccupied generations of social scientists in their efforts to do social science with the very abstract and so-called grand theories of such theorists as Marx, Freud, and, to take a more recent example, Parsons. Yet such problems provide the grist of the intellectual's mill, and if the work is sufficiently compelling or engaging the necessary scientific effort may follow and provide the breakthrough for the master's thought to be made useful rather than simply provocative. It may be, despite Etzioni's wordy and often complicated prose, that such will happen with this work. Anyone who wants to know what kind of pursuit many social scientists are likely to be engaged in over the next decade or so, at least, should read *The Active Society*.

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Medical State of the Nation

Currents in American Medicine. A Developmental View of Medical Care and Education. JULIUS B. RICHMOND. Harvard University Press, Cambridge, Mass., 1969. xviii + 142 pp., illus. $5.50. Commonwealth Fund Book.

This view of the state of the nation in medical affairs is a clinician's judgment on the health of American medicine. The author is neither historian nor sociologist, but he is an extremely able physician who has been at the eye of the storms in medical education and medical care as teacher, as medical school administrator, and most recently as director of Project Head Start and for Health Affairs at the Office of Economic Opportunity. As a participant for many years in the teaching institutes of the Association of American Medical Colleges, he has wrestled with the conceptual problems of the day in medical education and has attempted to conquer them. As a government administrator, he has had responsibility for one of the most significant efforts to implement change.

The aim of his book is "to attempt a historical analysis of evolution of medical services, education, and research in the United States since 1900 and, on the basis of this analysis, to raise questions for the future development of medicine as an institution in our society." There have been a number of such efforts, but this is certainly one of the best. The essay is consistently both objective and optimistic as it reviews the "educational revolution" from 1900 to 1940, the "scientific revolution" of 1940–1960, and the "consumer revolution" of 1960–1968. Particularly cogent is the discussion of the impact of the Flexner Report (published in 1910) and the Report of the Committee on the Costs of Medical Care (published in 1932); the former had great and far-reaching effects that are still felt on medical education, whereas the latter, as the author points out, has yet to be implemented today. He documents the good and the bad results of the massive federal commitment to medical research since World War II and suggests, quite logically, that the consequence of leaving the consumer out of the benefits of government spending enjoyed by practitioners, medical schools, and medical researchers is the current demand that the fruits of this effort be now made immediately available to the people, particularly to the poor. The analysis of legislative efforts to accomplish this end in recent years is particularly well done.

In looking to the future the author-clinician proclaims a favorable prognosis for further improvement in American medicine. He points out that the next new emphasis will very likely be on preventive health services. He has reservations, however, about the role of the teaching medical centers in this phase, and believes that community-based programs may hold the answer, if they are provided with institutional sponsorship. This is a curious view for a medical dean to hold at a time when the greatest difficulty is actually the lack of leadership in the delivery of health services. If the medical schools do not take the responsibility, it will inevitably be seized by others, possibly to the detriment of professional standards. The author does look upon some current problems with alarm, such as rising costs of care and overutilization of services, but he places faith in solutions by a so far nonexistent and nebulously conceived Presidential Council of Health Advisors.

As a whole, though, the essay is a useful analysis by an enlightened and perceptive participant. If it fails at all, and it does not in terms of its stated goals, it is by neglecting the pressing crisis of population growth, the shortages in health manpower, the inequities of the nonsystem of health care, the growing expense of an irrational distribution of services, and the lack of leadership from the medical profession. Perhaps there are no satisfactory answers to these problems today, and the next generation will have to find new approaches.

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Proteolytic Enzymes

Natural Proteinase Inhibitors. ROSEMARIE VOGEL, IVAR TRAUTSCHOLD, and EUGEN WERLE. Translated from the German edition (Stuttgart, 1966) by Express Translation Service. Academic Press, New York, 1968. xiv + 162 pp., illus. $10.

Interest in protein molecules that are capable of specifically combining with proteolytic enzymes to form inactive strong complexes is at present quite high. It stems in part from the recognition that important biological functions other than digestion and catabolism are carried out by proteolytic enzymes. Among these functions is the turning on (and off) of various enzyme and hormone systems and thus the control of many biological activities. Protein inhibitors can in turn control the controllers. Since the study of control is the height of scientific fashion, the study of protease inhibitors has become fashionable.

The second impetus for the study of protease inhibitors stems from the great advances of techniques in protein chemistry, which now allow us to ask and occasionally answer detailed questions about the nature of the enzyme-inhibitor interaction. Until quite recently this was not a profitable endeavor, but present techniques of isolation, separation, sequence study, protein modification, fast kinetic analysis, and x-ray crystallography raise realistic hopes of sizable success. Since the association of proteases with their protein inhibitors is one of the simplest and most specific protein-protein association phenomena, a rather large effort to achieve this success appears to be worthwhile.

These considerations have spawned a huge literature and have interested

many as yet uncommitted workers in thinking about the field. As is often the case in fields where the impetus for study comes from such diverse groups as pharmacologists, physicians, physiologists, general biochemists, and physical protein chemists, many of the participants do not understand one another. Thus there is a great need for reviews. This has been especially so since the reviews available are now quite old.

The present book is a translation of a somewhat smaller review published in German in 1966. In the process of translation the book was updated to include references to mid-1968. The strongest feature of the book is an unusually thorough coverage of the literature. It includes over a thousand references, some of them picked out from rather rare sources, such as Chinese journals, short abstracts, and Ph.D. dissertations. Hardly anything of which I was aware has been missed, and a great deal of which I was not aware has been included. An additional bonus is the inclusion of a good deal of otherwise unpublished information from the authors' prolific laboratory. There are many good tables summarizing comparative properties, such as amino acid compositions and specificities of interaction of various inhibitors with various proteases. The bias is on the biological side, with emphasis on the physiological action and possible therapeutic importance of the inhibitors. Physicochemical data are not slighted, but one is aware that they are written about by biologists, not chemists.

On the minus side, the book is not pleasant to read. There is essentially no general section, and the description of one inhibitor is followed by a description of another and yet another, the descriptions being organized solely according to biological source. Within each description fact follows fact with relatively little attempt (except in the tables) to summarize or to stress the most salient ones. Many of these flaws are due to a graceless translation and to the difficulty of grafting in the 1966–1968 papers in the revision.

In summary, the book is of great value to investigators of protease inhibitors as a source of much important information and as an unusually complete list of references. A novice, on the other hand, will not find it easy or exciting.

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Organelles

Microbodies and Related Particles. Morphology, Biochemistry, and Physiology. Z. HRUBAN and M. RECHCIGL, JR. Academic Press, New York, 1969. xii + 300 pp., illus. $14.50. International Review of Cytology, Supplement 1.

In the past few years it has become clear that the cells of some tissues in many organisms possess enzyme-containing bodies that can reasonably be considered as representatives of a widely distributed class of organelles, the microbodies. This book reviews the abundant relevant literature that already has accumulated. Appropriately, one of the authors is a microscopist and the other a biochemist. Electron microscopists identify microbodies as structures usually less than 1 micron in diameter, delimited by a single membrane and containing a moderately dense matrix in which a crystal-like core and other inclusions are sometimes present. Such structures have been isolated from several sources and shown to contain catalase and oxidative enzymes such as uricase, alpha-hydroxy acid oxidases, and D-amino acid oxidase; the fact that many of these enzymes can produce or decompose hydrogen peroxide has led to an alternative name, *peroxisomes*, proposed by DeDuve, who has pioneered in the biochemical study of the organelles. Recently developed cytochemical methods for light and electron microscopy are supplementing isolation procedures in establishing the coincidence of morphological and enzymatic characteristics.

In constructing their review, the authors of this book confronted difficulties arising from three major sources in addition to the uneven quality of the literature: (i) Microbody-like organelles have been found in many organisms, unicellular and multicellular, plant and animal, but it is not known whether they are essentially ubiquitous as are more familiar organelles such as mitochondria or the plastids of plants. Within a given organism their presence is demonstrable only in a few tissues (for example, in those green tissues that are capable of photorespiration and in vertebrate liver and kidney). (ii) The morphology and enzymatic capabilities of organelles presumed to be microbodies are quite varied in different tissues and organisms, although it is plausible to think of the resulting differences as variations on a theme. The variability is reflected, in part, in the several names that have been applied; for example, the *glyoxysomes* of castor bean endosperm contain enzymes of the glyoxylate cycle along with catalase and other enzymes. (iii) While key functions of microbodies in plant glycolate and glyoxylate metabolism (related to photorespiration or the transformation of fat into carbohydrate) seem increasingly firmly established, roles in animal cells are largely speculative, although there is no dearth of possibilities (for example, they may play a role in protection against peroxides, gluconeogenesis, control of reduced coenzyme levels, or uric acid metabolism).

For such reasons, the literature on several central topics is fragmentary, and much of it is descriptive, concerns details of unknown generality, or reports initial exploratory experiments. These difficulties are compounded by the fact that some of the morphological work and many of the interesting enzyme studies were done before it was recognized that a chemically and structurally distinctive type of organelle was involved. The authors thus had to choose between synthetic and cataloguing approaches. By and large they have taken the latter. The book surveys the literature up to mid-1968, taking up morphological questions first and then enzymological ones, and concentrating on animal material. The structure of microbodies in many organisms and tissues (mainly of vertebrates) is described and illustrated with numerous reasonably well reproduced electron micrographs. Information on several key enzymes is extensively reviewed, with catalase receiving somewhat more attention than the others. Changes observed during development, disease, and exposure to many experimental manipulations are outlined.

At surprisingly few places in the book do the authors undertake extensive integration of information; nor, in treating work by others, do they usually go much beyond reporting. For the relatively sophisticated reader this may be desirable, since enough details are presented to permit him to establish his own coherence in the mass of facts. For those unfamiliar with the limitations of cytochemistry, organelle isolation, or microscopy, however, the absence or underplaying of critical discussion at important points may be disconcerting or misleading. This is true also of the organization of the book; for example, terms like "1:12 polytubular crystalloid" or "marginal plate" are introduced and used for some time before they are adequately defined or