tice, such as, say, depriving some innocent person of his life. His opposition is strictly pragmatic, and is based only on the assumption that violence won't work in view of the superior physical power of the "gerontocracy." Thus Bay unwittingly betrays his own allegiance to justice. He also fails to notice that a revolutionary group, after throwing off the shackle of an unjust law, immediately establishes its own rule of law, embodying its own concept of justice.

Bay's theory is morally deficient. It fails to realize that all moral questions arise out of conflict of interest. Thus it fails to provide any theory of conflict-resolution. The resolution of conflict in such a way that justice is done all parties is the *sine qua non* of the idea of justice. Law properly conceived establishes due process for such resolution. Thus it works hand in hand with justice, even though, guided by a sense of justice, one must sometimes, perhaps often, challenge misconceived laws. Just systems of law even provide, must provide, machinery for their own challenging. Unjust systems without such provision must be met with force, and properly so, on grounds of justice, not mere expediency.

However, it must be said that some of the natural scientists do give their more humanistic colleagues cause for legitimate concern. Lederberg, for example, writes:

> The view that living organisms must have rules of their own, and that we cannot apply the simple laws of chemistry and physics or mathematics, is one that has been stubbornly held by a certain fraction of biologists but one that has been constantly retreating against the onslaught of scientific advance. . . . And that stubbornness, that unwillingness to reduce living systems to a materialistic framework, more than anything else accounts for the delay in the development of a chemistry of life.

It is my impression that this kind of reductiveness no longer bears critical examination. No sophisticated worker wants a conception of life not thoroughly grounded in the chemical-physical base, and none wants a conception of the noosphere not thoroughly grounded in the biosphere. But at the same time there is recognition by those who have done much thinking about it that every biological and psychic phenomenon must be studied at its own level of functioning and in its own contextual field. Such phenomena indeed *do* have their own laws, not reducible to chemical-physical laws, although they must be consistent with the latter. Yet the atomists, mechanists, and Skinnerians are still around, perhaps even predominate, and they are the ones who give the more humanistically inclined a feeling that, however sensitively humane a scientist may be personally and however productive he may be professionally, he may still adhere to an outmoded Newtonian-based ontology which is prejudicial to the recognition of uniquely human qualities. In any case, against the mechanistic technology spawned by natural science arises a counter-technology of personal relationship, psychic expansion, and esthetic sensitivity.

Herbert Muller, in his book, does not join this battle. He is well aware of it, and writes of it at length. His basic stance is melioristic, and he is inclined to believe that each side needs the other. His is a book of refreshing balance, and this is both its strength and weakness. This quality prevents him from offering any sharply provocative theses or any well-defined schemata that, even if wrongheaded, might challenge us to reorganize our thinking. The result is a certain blandness, even though one admires the soundness of his judgment and the humanity of his instincts. Looking at hunger, pollution, urban overload, and racism, he repeatedly avows pessimism. Yet some of the positive potentialities of the new technology and his own sturdy humanism prevent him from abandoning hope. If brain research opens up ways of manipulating the human mind, it also creates the possibility of greater human intelligence, shared by all. Information storage and retrieval technology threatens to destroy privacy, but offers the possibility of the consumer's rather than the producer's controlling what he receives, which in turn implies an individualizing of programming that might ultimately make dinosaurs of the mass media. In the end, life is going to be pretty much what we make it. Thus human nature is crucial. Up to now there has been little reason to be optimistic about human nature. But to some extent man makes himself and can remake himself, so who can tell . . . ? Somehow through his pessimism, Muller's old-fashioned faith in at least the possibility of human reasonableness shines through. If he is a pessimist, he is a genial pessimist.

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A Participant in Great Events

My Several Lives. Memoirs of a Social Inventor. JAMES B. CONANT. Harper and Row, New York, 1970. xvi + 702 pp. + plates. $12.50.

Martin Duberman has written of the wisdom that lies embedded in the "uncompleted past." If ever there was a rich source for a part of that uncompleted past—a part whose influence is still significant in contemporary affairs and yet which is just distant enough that it lies undiscovered by most of those who are now assuming dominant positions in our society—it is this autobiography, an autobiography as intense and complex as the life of its writer. The book is, indeed, three or more autobiographies in one, interwoven to correspond to the several intermeshed lives its author has led. It is not an easy book to read or to comprehend. But it is a most rewarding one, and its value as a contemporary archive of American history, spanning as it does the most dynamic and one of the most critical eras of transformation, must grow with time.

If the men and women who have worked closely over the last half-century with James Bryant Conant were, by some magic, gathered together, the company would be diverse indeed. Natural scientists, college presidents, educators concerned with American secondary schools, government officials, businessmen, diplomats, all would be included, with many another profession and focus of interest. Yet the members of that company would surely share one characteristic: admiration of two qualities in the man for and with whom they worked. The first is the rare capacity for combining thought with vigorous action which has characterized all his undertakings. The second is subtler and harder to define, but even more important. It is the remarkable capacity, displayed on numerous significant occasions, to "see around the corner" of events: to reach conclusions and to take critical decisions which, though they often were puzzling to his colleagues, in the ultimate event proved right.

It is these qualities in the author that unite the several lives. It is the striking view it gives of many aspects of American life in which he has exercised them that provides cohesiveness in a book which appears superficially diverse, and the thread of whose discourse, following the chronology of an amazingly full life, at times seems to wander tortuously and often to double back upon itself.

Indeed, when viewed in perspective, the major issues are few, and most are as relevant to the national life today as when they first unfolded. Education, of course, is a dominant theme in the book, as it has been in the life of the author. Early and valuable history appears of the place of the natural sciences in the American academic scene, and particularly at Harvard, built about Conant's personal experience as a rising American chemist. Academic administration in American higher education, pointedly in Harvard and in the University of California, is illumined. The theme of Germany, which has been prominent through much of the author's life, appears early, when German higher education is discussed in comparison with the American academic scene.

The account of Conant's years as president of Harvard gives insight into a great private American university in days quite different from the present. That insight is linked, much later in the book, to the author's views on academic freedom, a matter of intense concern today. At a different level, American secondary education, a more recent concern of Conant's, is extensively discussed at many places through the book. The dichotomy of "private versus public" secondary education, in which Conant's interest was perhaps first aroused by his observation of Australian secondary education, the question of parochial versus nonsectarian schools, and the innovation of the two-year college are but a few of the aspects of that subject he deals with.

The author's views of American science in wartime, forged by his intimate participation in science and its affairs in two World Wars, afford what is perhaps the first comprehensive account of that subject since James Phinney Baxter's *Scientists against Time*. But the author's concern with past and present experiences of war and their social impact is much broader. There are thought-provoking treatments of the evolution of the United States's view of its own position in a world at war: remarks, for example, on the character of American isolationism at the beginning of World War II, and an account of the evolution and conduct of the draft and a consideration of its morality and its social significance.

In a somewhat different category are the author's accounts of his experiences as High Commissioner, and later Ambassador, to Germany: accounts of personal experience that give a vivid pic-

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ture of one facet of the critical formative years of a divided Germany and a divided Berlin.

The subtitle of the book is "Memoirs of a Social Inventor." Social innovation, clearly, has been an important concern throughout the author's life. It has yielded many and significant fruits, some of which are described in this volume. During Conant's presidency of Harvard University, the Society of Fellows and the Niemann Fellowships were established, the device of the ad hoc committee was made more effective, and the School of Education was revitalized and the Master of Arts in Teaching degree inaugurated. These innovations, for most of which the author was indeed the inventor and with all of which he was deeply concerned, receive extensive treatment. So, on the national stage, do some of the "inventions" which have helped to form our social history, or which constitute contemporary institutions of importance: the National Defense Research Committee, which Conant headed during World War II and which, with its parent body, the Office of Scientific Research and Development, served as the organizational prototype for many later developments relating science to government; the citizens' Committee on the Present Danger, of which Conant was a founder and which played so important a role during the Korean war; the Educational Testing Service, of great contemporary significance, to whose founding the author contributed critically, though he disclaims its actual invention; and the attempt to control the use of atomic energy, on the early stages of which Conant's lively description sheds added light.

This is but a sampling of the illuminating detail in this autobiography. There are parts which are wholly personal, and not of much wider significance: chapter 17, for example, an account of the author's mountain-climbing expeditions, or the chapters on his early life—although these opening chapters provide vignettes of Boston in the last decade of the 19th century and the first of the 20th that are fascinating.

In its detail and its diversity, the careful reader of the book will surely recognize the mine of important historical information it constitutes. Not the least remarkable feature of the book is the author's use, for documentation, of letters he has written at various times—a feature which adds much and which he says is due particularly to his wife.

The book can hardly be better summarized than in the judgment of Vannevar Bush given on its jacket: "This book will have many audiences, many publics, for it is the record of one of the most versatile men of our times. Its range is wide, from pedagogy and science to weapons development to statecraft to diplomacy, and no matter where his service was called for, the author's action was highly effective, and the record is good reading indeed."

It will be a record of enduring value.

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The Food-Supply Question

The Hungry Future. RENÉ DUMONT and BERNARD ROSIER. Translated from the French by Rosamund Linell and R. B. Sutcliffe. Praeger, New York, 1969. 272 pp., illus. $6.95.

Seeds of Change. The Green Revolution and Development in the 1970's. LESTER R. BROWN. Published for the Overseas Development Council by Praeger, New York, 1970. xvi + 208 pp., illus. Cloth, $6.95; paper, $2.50.

The World Food Problem. A Guardedly Optimistic View. WILLARD W. COCHRANE. Crowell, New York, 1969. xvi + 334 pp. $7.95.

Both population growth and agricultural development have been and remain highly dynamic and critical elements in the total development process. During the 1960's the less-developed countries of the tropics experienced rates of growth in both population and agricultural production that were exceptionally high, in comparison to either the historical or the contemporary experience of the developed countries. The decade of the 1960's was also characterized both by a world food crisis and by a revolution in the technology of food-grain production.

The book by Dumont and Rosier is heavily inspired, both in its analysis and in its rhetoric, by the food crises of the mid-1960's. The book by Brown reflects the insights and enthusiasms of the "green revolution." Cochrane relies on the concepts and methodology of modern economics to examine the dimensions of the world food crisis and the potentials of the new biological technology. All three books give detailed consideration to the policies that will be necessary, in both the developed and the less-developed countries, to avoid a "hungry future."

The three books differ in other respects. Dumont and Rosier's is the most comprehensive; it contains an excellent treatment of the recent agricultural development experience of the socialist countries as well as of the Western developed countries and of the less-developed countries of the Third World. Cochrane's book conveys a sophistication and a hard realism with respect to agricultural and development policy, reflecting both his earlier academic research and his role as an agricultural administrator and as a consultant. The book by Brown is more brilliant and imaginative and more erratic than the others. Both Cochrane's and Brown's books reflect substantial modifications of earlier views: Cochrane is now more willing to concede the significance of the role of prices in guiding the use of resources in the development process and to accept the limitations of food aid as a tool of development, and Brown has turned 180 degrees from his earlier Malthusian perspective, which he shared with Dumont.

A common "model" of the agricultural development process is implicit in the three books. The model can be characterized as follows: Agriculture is no longer a resource-based industry. It is a technology-based industry. The modern biological, chemical, and mechanical technology which is the source of agricultural growth is primarily the product of public-sector agricultural