quired to make choices, I should dip into the Kahn-Wiener volume, and dip deeply. The analysis of frightening states of the future from literary sources offered by Hillegas strikes me as scholarly, and a timely reminder that viewing the future with alarm is not an invention of the current "futurologists."

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Lessons from Scandinavia

The New Sweden. The Challenge of a Disciplined Democracy. FREDERIC FLEISHER. McKay, New York, 1967. xiv + 365 pp. $6.50.

The Social Programs of Sweden. A Search for Security in a Free Society. ALBERT H. ROSENTHAL. University of Minnesota Press, Minneapolis, 1967. xx + 193 pp. $6.

Sweden presents to Americans a unique aspect among the world's nations: it is the only society widely regarded as "ahead of America." What it means to be "ahead" is ambiguous. One of its meanings, however, is clear: Sweden, as a highly developed nation with the highest standard of living in Europe, has resolved certain problems of modern society that America has not yet fully faced. The Swedish solutions most challenging to Americans are in the problem areas of sex, alcoholism, and economic security.

As a deep and durable mode of personal relationship, sex has been a "social problem" in every organized society. Even the most primitive forms of social organization included—often began with—codes regulating sexual behavior, from incest tabus to more sophisticated marriage rules. The regulation of sex has been an important indicator of the state of all the arts and sciences in the social environment. We do not yet know how to interpret this valuable indicator in a general way, but we already know enough to doubt any general law that postulates a linear relationship between sex and society. There are examples at hand to disprove any hypothesis which asserts that more "advanced" societies also have more "advanced" sex codes. In part, this is an artifact of the present limitation of our measurement techniques. Even an aggregate measure of sexual activity (which the Swedes appear to have derived as a Pareto function of the ratio between childbirths and the sales of condoms) teaches us little about the effect of sex on the "quality of life" as experienced in a particular society—and a fortiori in the typological constructs which we call "developed" and "undeveloped" societies.

The point was illustrated a few years ago by the studies of marriage rules in the Kariera and Tarau societies made by mathematician John Kemeny of Dartmouth. Kemeny's analysis showed that "their procedures could have been considerably improved [in terms of their own value-goals] if they had been in a position to use modern algebra to design the rules." The question immediately arises: What would the Kariera and Tarau societies have to *become* in order to put themselves in a position to use modern algebra to improve their marriage rules? The next question: If they *could* use modern algebra, would they then be content merely to improve their marriage rules, or would they (as seems more likely) seek new rules more "appropriate" to a society that can use modern algebra?

This is the question faced by Fleisher's book. *The New Sweden* is a worthwhile effort to survey the existing social scene. Written in brisk, journalistic style, it aims at revealing the whole social context in which contemporary Swedes are seeking to solve their problems of sex-and-society in the context of security-and-society. An indicator of its serious purpose is the treatment of the Swedish suicide rate, usually believed by Americans to be the highest in the world. I quote Fleisher:

> Violence in Sweden tends to be inner directed. The rates for violent crimes are very low, about one tenth of the rates for murder, manslaughter, and rape in the United States, whereas nearly twice as many suicides are reported. Sweden's suicide rate ranked ninth in the world, according to figures released by the World Health Organization (WHO) late in 1966.
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> Swedes, who justly pride themselves on the accuracy of their official statistics, believe that their propensity for suicide is exaggerated. They argue that pressures for the concealment of suicide as a death cause are almost nonexistent. Their figures may seem high, but those in other countries would be much higher if the strong religious and moral reasons for concealment were removed.

The new Sweden portrayed by Fleisher is "ahead" of all other societies, including America, mainly in its reliance upon the public forum for the articulation of social norms and the regulation of individual behavior. The secular trend of postwar Sweden has been away from legislation and to education as a mode of social control. Education, which the Swedes appear to regard even more reverently than the Americans, is broadly construed to include all means of supplying public information and shaping public opinion.

Fleisher's account of alcoholism in the new Sweden is another case in point. Though generally regarded as the modern world's heaviest drinkers, the Swedes are here reported (on page 25 but unhappily without documentation) to consume "less" alcohol than the French, Italians, Germans, Danes, or Americans. The more pointed moral, however, is that the Swedes have moved steadily—since their two "October revolutions" of 1955 and 1965—from legislation against intemperance to education for temperance in their handling of this problem. Since sex and drink are two important social problems facing Americans today, it is clear why an American student of the new Sweden subtitles his book "The Challenge of a Disciplined Democracy."

It is equally clear why A. H. Rosenthal subtitles his book on the new Sweden "A Search for Security in a Free Society." Rosenthal's book has a narrower compass than Fleisher's, but it takes deeper soundings within its range. Among its assets is a foreword by Marquis Childs, author of the classic account *Sweden: The Middle Way*, which first alerted Americans to the challenge of a prospering democracy that could rise above the confrontation of communism versus fascism in the 1930's. Childs stresses that the exaggerated accounts of Swedish alcoholism, sexuality, and suicide have led Americans "to ignore the real contribution that Sweden has made in a half dozen fields, and particularly in the fields of social security and public health."

Rosenthal addresses himself particularly, as his title indicates, to the social programs of Sweden. His purpose is comparative to all and specific to Americans: "This book was undertaken on the premise that a description of the major Swedish social programs would be of value to Americans and others seeking to improve the social programs in their own countries." The book is exemplary in its coverage—social security programs, health insurance, public health, welfare, and related programs. It even includes a chapter, which should grip every American reader concerned

with the search for security in a free society, entitled "Program comparisons: Sweden and the United States."

These two books are well written in different styles, informative, and even exciting in different ways. The exciting message they convey is that Sweden does have something to teach Americans as well as other developed nations. The lesson is especially poignant in America, the present *primus inter pares* of the world's powers. No society has bet more heavily than America on the public forum—free public education plus mass media plus social science; but it still seeks the payoffs that are already visible in Sweden.

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Assault on the Citadel

The Ghost in the Machine. ARTHUR KOESTLER. Macmillan, New York, 1967. xiv + 384 pp. $6.95.

The Ghost in the Machine is a book about psychology and evolution and genetics and the brain sciences and even a bit about sociology and history and philosophy. It takes a brave man to write such a book. But Koestler is, after all, knowledgeable in the history and philosophy and substance of science, and the fact that he dares write of matters scientific with wit and style and occasional brilliance does not make it any easier to categorize him as a popularizer who does things once-over-lightly. Indeed, many scientists reading *The Ghost in the Machine* will probably be pleased by all sections minus one. The one section that will evoke the least enthusiasm will be the one where the reader's particular specialty is under discussion. This is not, however, meant as a snide criticism of Koestler—for the fault lies not all in Koestler. No one of the life sciences is in short supply of blemishes; Koestler seeks out these vulnerable spots, and when he finds them, he attacks. He is no mean polemicist, and when he attacks, he hurts.

At the very outset of his argument Koestler announces his targets:

> The citadel of orthodoxy which the sciences of life have built in the first half of our century rests on a number of impressive pillars, some of which are beginning to show cracks and to reveal themselves as monumental superstitions. The four principal ones, summarised in a simplified form, are the doctrines
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> a) that biological evolution is the result of random mutations preserved by natural selection;
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> b) that mental evolution is the result of random tries preserved by 'reinforcements' (rewards);
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> c) that all organisms, including man, are essentially passive automata controlled by the environment, whose sole purpose in life is the reduction of tensions by adaptive responses;
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> d) that the only scientific method worth that name is quantitative measurement; and, consequently, that complex phenomena must be reduced to simple elements accessible to such treatment, without undue worry whether the specific characteristics of a complex phenomenon, for instance man, may be lost in the process.

Let me illustrate Koestler at work (confining [illegible] SCIENCE, VOL. 160 throughout this review, to his treatment of psychology, which occupies about half the book). To begin with, and with his pen sharpened to a stiletto point, Koestler goes after the behaviorists. Now those of us who are psychologists of the nonbehaviorist persuasion cannot, of course, completely disassociate ourselves from our benighted brethren—many of them are our respected colleagues. And even if we feel (as I do) that behaviorism (the paleo-form of Watson or the neo-form of Skinner) is one of the greatest of catastrophes that have befallen our science—even so we cannot but squirm uncomfortably when he introduces his discussion of experimental psychology with a quotation from Swift's account of his *Voyage to Laputa*: "He had been eight years upon a project for extracting sun-beams out of cucumbers, which were to be put into vials hermetically sealed, and let out to warm the air in raw inclement summers." We continue to squirm when Koestler tells the world that "There is hardly a self-respecting psychological faculty in the Western world without some white albino [*sic*] rats disporting themselves in so-called Skinner boxes, invented by that eminent Harvard authority. The box is equipped with a food tray, an electric bulb, and a bar which can be pushed down like the lever of a slot machine, whereupon a food pellet drops into the tray."

We look over our shoulder in embarrassment to see whether any of our scientific colleagues are also reading when Koestler quotes Harlow in 1953 to the effect that "a strong case can be made for the proposition that the importance of the psychological problems studied during the last fifteen years has decreased as a negatively accelerated function approaching an asymptote of complete indifference."

And we hardly have the heart to fight back (or even to complete filling out our latest grant-request form) as he ends his chapter castigating a psychology which "lives on specious analogies derived from the bar-pressing activities of rats. The record of fifty years of ratomorphic psychology is comparable in its sterile pedantry to that of scholasticism in its period of decline, when it had fallen to counting angels on pinheads—although this sounds a more attractive pastime than counting the number of bar-pressings in the box."

Clearly, insofar as I am my brother psychologist's keeper, I am not going to be pleased with Koestler On Psychology; and clearly part of my displeasure derives from the truth of much of what Koestler has to say. But having said that, I have said only part of what needs saying. For part of my irritation with Koestler on psychology, and by far the larger part, derives from Koestler's unfair and unscholarly job. Koestler is guilty of some of the most grievous sins of the polemicist. He overstates, he understates; he selects data, he neglects data. Koestler to the contrary, "academic or 'experimental' psychology, as it is taught at the great majority of our contemporary universities," is not restricted to counting bar-pressings in the box, or to adumbrating in talmudic arguments (in midwestern accents) upon behavioristic themes. To argue this way,