localization of genes to G bands. In a summary of the molecular genetics of globin genes in the mouse, Leder *et al.* beautifully explain the methods of recombinant DNA technology and the impact of the split genes and intervening sequences in evolution. Green describes future work in which classical and molecular genetics will be brought to bear to decipher why genes are arranged the way they are on chromosomes. So, the 50th anniversary of the Jackson Laboratory presented 3 kilobase pairs of mouse sequence, leaving the remaining 2.299997×10^6 for the next 50 years.

In a section on differentiation and developmental genetics, Papaioannou's paper on chimeras and Illmensee's on manipulation of the mouse embryo describe mind-boggling experimental achievements and approaches for analyzing how genes control development. Stevens's continuing intriguing study of teratocarcinogenesis exemplifies his ingenuity in finding genes that determine the formation of teratocarcinomas. In 1967, he found that 1 percent of strain 129 males developed testicular teratocarcinomas. Only one teratoma was found in 11,000 F_1 hybrids of strain 129, although in several other strains the effects of multiple genes were indicated. Stevens began looking for these genes and in 1973 discovered the gene "*ter*," which increased the incidence of spontaneous teratomas to 30 percent.

A number of papers deal with medical genetics. McKusick outlines the staggering progress of the last 20 years in defining genetic defects in humans. Lux *et al.* describe the hemolytic anemias in mouse and human that result from abnormalities in spectrin. Scriver compares inborn errors of metabolism in the two species. Coleman details the fascinating experiments on the effects of genes that determine obesity and diabetes in the mouse.

Immunogenetics is covered in three papers. Bodmer discusses histocompatibility gene clusters from several species. In a paper on the future of immunogenetics Snell discusses the biological significance of MHC polymorphisms. Heston describes the development and utilization of inbred mice in cancer research.

The symposium concludes with two papers on retroviruses. Baltimore reviews the Abelson virus, a defective retrovirus that carries a host-gene element, which when transcribed in cells transforms them. Rowe *et al.* describe the finding of integrated retroviruses in the mouse genome. It is remarkable and curious that roughly 0.1 percent of the 2.3×10^6 kilobase pairs in the mouse are thought to be retroviral sequences. These genes are directly or indirectly responsible for the high incidence of mammary tumors and leukemias in some inbred strains of mice.

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Interferon Popularized

Interferons. A Primer. ROBERT M. FRIEDMAN. Academic Press, New York, 1981. xii, 152 pp., illus. $17.50.

Not so long ago interferon research was a highly specialized, somewhat esoteric branch of virology familiar to a small group of aficionados. Most physicians and biologists were likely to have encountered the term "interferon" somewhere in the professional literature but otherwise had little awareness of its significance. To the layperson the term was very likely meaningless. The fact that Friedman deemed it appropriate to write a primer about interferons (and even managed to find a reputable publisher ready to print it) indicates how profoundly the perception of this field has changed in the last couple of years.

Friedman set out to write a book "for the student, scientist, physician, or educated layperson who wishes to know something about interferons." The book is of a rare sort—not quite an authoritative monograph or scholarly review and not really a textbook. In a style reminiscent of articles published in *Scientific American* Friedman explains what interferons are and describes their varied biological functions, activities, and possible medical applications.

Friedman develops the subject in a systematic, logical sequence. He describes the discovery of interferons by Isaacs and Lindenmann some 25 years ago. For the reader with no previous exposure to experimental work with interferons, a short chapter describes assay methods most widely employed in laboratory research. Other chapters describe how interferons are produced and purified. More than half of the book is devoted to a thorough analysis of the various actions of interferons, an evaluation of the role of interferon as a factor in the natural defense against viruses, and a realistic assessment of the possible clinical uses of interferons in viral infections and cancer.

Despite its compactness, the book contains a fair amount of technical detail, much of it highlighted by useful illustrations and summarized in simple tables. The subtitle of the book may be somewhat misleading; this is not a primer suitable for the reader totally uninitiated in modern biology, biochemistry, and immunology. Written in a refreshingly clear style and with a useful glossary of technical terms appended, the book will be most appreciated by science-oriented college students and physicians wishing to learn about the many ramifications of interferon research in biology and medicine.

Those reaching for this small book will not be shortchanged. One of Friedman's accomplishments is that he avoids oversimplified generalizations and cheap promises of miraculous curative powers of interferons while conveying some of his own excitement with this field of research.

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Biological Gerontology

Aging. A Challenge to Science and Society. Vol. 1, Biology. Papers from a conference, Vichy, France. D. DANON, N. W. SHOCK, and M. MAROIS, Eds. Published on behalf of l'Institut de la Vie and the World Health Organization Regional Office for Europe by Oxford University Press, New York, 1981. xvi, 346 pp., illus. $59.50.

This is the first of three volumes on the scientific, medical, and social aspects of aging that l'Institut de la Vie and the World Health Organization plan to produce. The volume, which is based on the proceedings of a conference held in 1977, contains 30 papers on topics ranging from theoretical gerontology and cell biology to the physiological aspects of aging. Most papers are reviews based to a large extent on the authors' own work, and few, if any, contain data not available elsewhere. Despite the international intent and European location of the conference, 43 of the 53 listed contributors are from the United States. One wonders whether this reflects American dominance in biological gerontology or whether other factors are operating.

Several sections of the book are particularly worthwhile. A 60-page section on the central nervous system is excellent. It includes discussion of age-related differences in brain anatomy, blood flow, and neurotransmitter activity as well as

of the anatomical and cerebellar blood flow findings in senile dementia. This section would have been significantly strengthened by the inclusion of a discussion of the neurotransmitter changes in dementia, a subject that has stimulated an investigative frenzy over the past several years. Discussions of theoretical gerontology by Sacher, Hayflick, and Singer are thoughtful and stimulating. A section dealing with the impact of environmental factors and life patterns is timely, given current interest in health enhancement, and is particularly notable for the stimulating and innovative analysis by Andres of the apparently beneficial influence of obesity on human longevity. Walford's now-familiar discussion of the relation of immunosenescence and aging is a classic.

The book has some weaknesses. Though most of the papers have been revised, some have not been updated since their original presentation four years ago. The organization of the book is such that the most basic and introductory material, dealing with cell biology and theoretical gerontology, is sandwiched between sections dealing with physiology or pathophysiology.

Despite the minor flaws, this volume is chock full of good information. Though not encyclopedic in scope, it certainly can serve as a useful resource and limited "handbook" of gerontology for both students and experienced investigators.

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Politicization Examined

The Dynamics of Technical Controversy. ALLAN MAZUR. Communications Press, Washington, D.C., 1981. x, 150 pp., illus. Cloth, $11.95; paper, $5.95.

The first question to which this interesting book is addressed is why certain public issues in which scientific and technological considerations are of crucial importance become controversial to the extent that normal scientific procedures for validating one conclusion or another are ineffective and "politics" takes over. Mazur uses four cases to explore his concerns and illustrate his arguments: the ABM, fluoridation of water, the building of nuclear power plants, and the siting of high-voltage transmission lines. All involve technical issues, but none was settled on "merely technical" grounds. In each case scientists could be found on each side, confounding facts with values, arguing past one another, often moving toward polarized positions with passion that admitted of no compromise.

Mazur does not try to define what constitutes a scientific or technical controversy except when he indicates that the "products of science and technology have increasingly become objects of controversy, and political debates about them have grown so complex that few people understand what is going on" (p. ix). All of his cases involve "products of science and technology," but nowadays a set so defined would surely embrace an enormous share of the policy agenda (especially if one includes economic analysis as one such product!). All of his cases involve some sort of protest movement. The debates escaped the confines of laboratory, war room, or court to engage a wider public. In the process they became associated with other issues, drew on a more encompassing rhetoric, and, in turn, became dependent on the momentum of the larger coalition of which their advocates had become a part. Pursuant to this analysis, Mazur makes some interesting predictions, for example, tying the future course of public worry about nuclear power not to the issue of technical safety but to the more general issue of energy supply. If concern about the latter wanes, he suggests, concern about the former will also fade.

Mazur includes protests emanating from both the left and the right sides of the political spectrum. He suggests that the political complexion of each movement was set early on and that adherents who joined up later did so more as a function of their political orientations and social network connections than because of anything inherent in the technical substance of the issues. Fluoridation, he suggests, involved technical questions not very different in their policy implications from those raised by nuclear power plants. But antifluoridation was a right-wing cause and nuclear power is opposed by the left.

Mazur is suitably modest about his data base, but his arguments are sufficiently cogent to overcome many reservations regarding their empirical underpinnings. One wishes that he had tied his analysis more closely to the work of those who have investigated the dynamics of protest movements generally and of those who, like the late E. E. Schattschneider, have addressed themselves to the processes of public agenda growth and change. This is to say, in part, that since his cases are so much a part of the generic political process Mazur has written a book of much broader public relevance than, perhaps, he intended. His more prescriptive conclusions suggest that he may have recognized this himself. In the early part of the book he defends the notion of a "science court" or referee to help separate disputes over matters of fact from those over values. In his conclusion, however, he emphasizes the usefulness of adversarial roles and contentious advocates throwing up arguments and disputing in whatever ways are politically effective. In this way, Mazur suggests, the risks and benefits of technology may be more fully identified and explicated than they otherwise would be. In the end he takes substantial comfort from "normal political processes" and sees no better (or, perhaps, worse?) reason for enlarging citizen participation to determine science policy than to determine the money supply or decide how to extricate hostages from Iran. In this, as in much of the book, Mazur's views will not win unanimous approval but are eminently worth careful attention.

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