on the M.I.T. faculty for 20 years before coming to Carnegie as president, says he hopes to make his administration a period in which his institution will move into the first ranks in all areas in which it offers instruction. The announcement that Carnegie will become a university which will include the Mellon Institute is an indication of the size of the task which Stever assumed during his first period in office.

Stever and other Carnegie educators seem to have no doubt that the problems surrounding the merger with Mellon and the creation of a university will eventually be surmounted. At present, the chances seem good that Carnegie University will eventually be able to provide its ambitious vision with substantial form.—BRYCE NELSON

Electric Utilities: Technology Leaps Ahead of Regulation

The nation's huge electric utility industry, representing an investment of $70 billion, will get a jolt from *Overcharge*,* a book by U.S. Senator Lee Metcalf (D–Mont.) and his executive secretary, Vic Reinemer. The authors are carrying on the campaign Metcalf began several years ago to bring the investor-owned utilities—the I.O.U.'s, the Senator calls them—under tighter regulation.

Senator Metcalf, having just been reelected for his second 6-year term, is in a position to give the utilities some bad moments. As a member of the Senate Government Operations Committee, Metcalf hopes to initiate an investigation of the power industry and the regulatory process. He would be joined in this endeavor by Senator Ernest Gruening (D–Alaska), who 35 years ago wrote *The Public Pays*, a work which is *Overcharge*'s spiritual forebear. Also, as a member of the tax-writing Senate Finance Committee, Metcalf will suggest a congressional review of tax policies under which, he says, some right-wing organizations supported by the utilities for propaganda purposes enjoy tax-exempt status and the privilege of soliciting tax-deductible contributions.

The thesis of *Overcharge* is simply that, while a galloping technology has steadily reduced the utility industry's costs in serving a rapidly expanding market, existing regulatory practices are as obsolete as the kerosene lamp. The consequence, the authors insist, of this incongruity between a technologically advanced power system and an antique regulatory system is that far too little of the savings in operating costs are passed on to the consumer, especially the residential consumer. They contend, moreover, that the consumer and the general public are the targets—all too often the gullible targets—of propaganda giving an upside-down picture of the investor-owned utilities.

"As the spread between the cost and the price of power widens, the industry advertises that electricity is the biggest bargain in the family budget," the authors say. "While publicly proclaiming the desirability of utility regulation, the industry quietly works for repeal of the basic regulatory laws. While collecting more money than they need for taxes, and keeping the difference, they advertise themselves as the biggest taxpayer in the state, or 'Your Tax-Paying (Not Tax-Eating) Electric Company.' "

In the authors' view, the regulatory process is sadly anemic. The regulation of electric utilities rests largely with the states. But state regulatory commissions, according to the authors, usually lack the staff and other resources necessary to properly oversee power companies and other utilities and public carriers for which they are responsible. (There are usually hundreds, sometimes thousands of companies—bus and truck lines, gas companies, and telephone companies as well as electric utilities—under a commission's jurisdiction.) In 1963, the authors found, all of the state commissions together had only 500 accountants, and, of these, only one in ten was a certified public accountant.

In 1965 the Federal Power Commission, whose limited jurisdiction includes interstate transmission of power and its sale at wholesale in interstate commerce, had only 38 field auditors. The FPC staff assigned to electric power matters was smaller than in 1949, when the utility industry was only a third the size it is today.

A fourth of the state commissions, the authors say, have not conducted a public inquiry into electric utility rates in 8 years or more, and some never have had a "rate case" since they were created. In Maryland a few years ago the counsel to the Public Service Commission, Francis X. Gallagher, resigned in frustration. He had given up trying to regulate more than 200 utilities with a small staff that was no match for the utilities' teams of experts.

"The pendulum of control is shifting to the utilities and the state regulatory agencies are powerless to reverse this trend without aid from the legislative bodies," Gallagher said. "We ask the impossible when we expect a corporal's guard to analyze the rate schedule submitted by scores of utilities to determine their inherent fairness. . . . We have to accept the figures given to us by the utilities."

In some cases, it must be added, there is little desire on the part of the utility commission to keep a close watch over the utilities. During a congressional hearing in 1965, Edwin L. Mason, chairman of the Florida Public Service Commission, said, "The best regulation is little or no regulation."

The new technology which has resulted in lower power generating and transmission costs has come swiftly since World War II. As the authors note, steam power is being generated in larger and larger units at higher and higher pressures, permitting a great increase in the amount of energy obtained from each ton of coal. At some power dams a "pump-back" system is employed, so that the same water can be used repeatedly to spin the turbines.

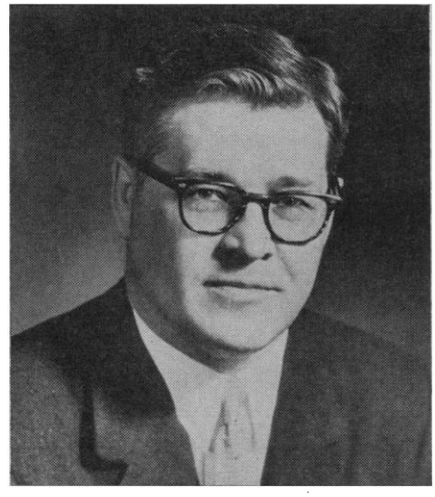
* Published 27 January by David McKay Company, New York; 338 pp.; $5.95. Metcalf, a graduate of Stanford University (A.B.) and the University of Montana (LL.B), served as an associate justice of the Montana Supreme Court and as a member of the U.S. House of Representatives before his election to the Senate in 1960. Reinemer, a former newspaperman, was awarded an American Political Science Association congressional staff fellowship in 1965 to make a study of utility regulation and water resource policy. A graduate of the University of Montana (A.B.), Reinemer was a visiting lecturer of journalism at the university in 1960. The fact that he is identified as co-author of *Overcharge* represents a breakthrough in congressional candor. It is widely assumed that congressional assistants actually do a large part of the work on books and articles bearing the names of senators and representatives, but seldom is the hidden authorship acknowledged.

"Nuclear-generated power has moved from the experimental to the practical stage and by 1980 will be generating about one-eighth of the nation's power needs," the authors observe. They add that, although the average cost of nuclear power per kilowatt-hour was about half a cent (5 mills) in 1950, the Tennessee Valley Authority last year awarded General Electric a contract for two nuclear generators that will produce electricity at an estimated 2.37 mills per kilowatt-hour.

Another, and very important, breakthrough in reducing costs has come from new long-distance transmission methods permitting establishment of large regional and interregional power grids. The new inter-ties have provided a way to satisfy peak demands that is much less costly than the old method of firing up additional boilers (where hydropower for peaking purposes is lacking). For example, a city in the Midwest may obtain peaking power, via extra-high-voltage transmission lines, from hydroelectric or steam plants in other time zones where the day's peak demand has passed or not been reached. According to the authors of *Overcharge*, the utility industry, through use of long-distance transmission, will save $3 billion over the next 14 years which would otherwise have to be invested in stand-by generating plants.

Metcalf and Reinemer contend that rate reductions have by no means kept up with the decline in the utilities' legitimate operating costs, even though the reductions have been substantial. (Between 1926 and 1962, according to FPC, the average cost for all users of a kilowatt-hour of electricity declined by 40 percent, from 2.7 cents to 1.68 cents. Since rate schedules are designed to favor greater consumption, average cost per kilowatt-hour can go down despite slight rate increases. This occurred during the 1950's. In recent years, however, FPC has reported small decreases in the price of electricity for all types of service and for all sizes of bills.)

The authors note that the theoretical rate of return most commissions allow a utility is about 6 percent on invested capital. This supposed ceiling on profits is a reflection of a fact central to the theory of rate regulation: an electric utility, providing an essential commodity and enjoying a monopoly in its service area, bears little resemblance to the ordinary risk enterprise. Accordingly, regulatory theory holds that, so long as the utility is assured of a 6-percent return, economies resulting from more efficient and less costly operations should benefit the consumer. In the authors' judgment, this principle is being flouted.



Senator Lee Metcalf

"In 1947," they say, "the I.O.U.'s had an industry-wide return on invested capital of 5.6 percent. In 1961, the return on invested capital of the 34 predominant investor-owned utilities was 9.1 percent. The return kept climbing upward, 9.5 percent in 1962, 9.7 percent in 1963. In 1964, it reached 10 percent, approximately twice as high as the average for the 50 leading transportation companies." By another measure of profit, return on common-stock equity, the large utilities are doing even better, the authors say. The return on common stock of 44 such companies exceeded 15 percent in 1963. Eleven of the 44 companies had their headquarters in Texas, one of the four states which has no commission with jurisdiction over the investor-owned utilities.

The practice of many utilities of granting stock options to company insiders is roundly denounced by the authors as having no place in a risk-free enterprise. They report that Montana Power Company—one of Metcalf's long-time political foes—set aside 750,000 shares, or about 10 percent, of its common stock under restricted stock option plans. By 1966, company officials had acquired almost 500,000 shares, worth about $14 million, sometimes at only a third or a fourth the price paid by ordinary stockholders. Montana Power's president, J. E. Corette, a former president of Edison Electric Institute (the utilities' trade association), still held unexercised options on 35,000 shares, with a market value of about $1 million.

Better than a third of *Overcharge* is devoted to a discussion of the utility industry's efforts at image-making and shaping public opinion. In 134 pages, containing a wealth of documentation, the industry's advertising and public relations activities—carried on through industry organizations and organizations to which the industry contributes financially—are described.

Through its contributions and the participation of some company officials the industry is convincingly linked with a number of right-wing groups. For example, in 1964 the officers and directors of the Southern States Industrial Council included top officials from 11 utilities. The council has labeled the Civil Rights Act of 1964 "clearly of communist origin and inspiration" and has described the United Nations International Children's Fund as a "propaganda agency for the worldwide communist conspiracy."

According to the authors, the utility industry has contributed heavily—frequently at the ratepayer's expense—to organizations such as the Foundation for Economic Education, at Irvington-on-Hudson, New York, which sponsors seminars and distributes books and other literature to schools and colleges.

Recent articles in *The Freeman*, a magazine published by the Foundation, advocate repeal of the income tax and withdrawal of government from education, from highway construction, from postal service—and from public power. (Metcalf and Reinemer believe that lower-cost power produced by the Tennessee Valley Authority and other federal or publicly owned local agencies forces at least some investor-owned utilities to push their rates downward.)

The authors are persuaded that a major advance in regulation can come from the application of electronic data processing to the study of operating costs and rate schedules. In announcing publication of *Overcharge* recently, Senator Metcalf said, "Full use of electronic data processing in utility regulation could save electric consumers billions of dollars. Utility data should be programmed into computers so that regulatory commissions can determine comparability, quickly obtain details of questionable expenditures, anticipate overcharges and order hearings on timely rate adjustments."

The field of utility regulation would benefit also, the authors believe, from more attention in academic circles. "A few lonesome public utility scholars," they observe, "have chronicled the

NEWS IN BRIEF

• **AEC HIGH-ENERGY PHYSICS PANEL**: The Atomic Energy Commission has set up a 12-member advisory panel on high-energy physics to provide advice and guidance to the AEC in this area of physical science research. The panel is chaired by Victor F. Weisskopf, head of the physics department at MIT. Other members are Rodney L. Cook, Brookhaven National Laboratory; Earle C. Fowler, Duke University; Leon Lederman, Nevis Laboratories, Columbia; Edward J. Lofgren, Lawrence Radiation Laboratory, University of California, Berkeley; George E. Pake, Washington University; W. K. H. Panofsky, director, Stanford Linear Accelerator Center, Stanford University; Robert G. Sachs, Argonne National Laboratory; Keith R. Symon, University of Wisconsin; Robert L. Walker, California Institute of Technology; Robert R. Wilson, Laboratory of Nuclear Studies, Cornell University; and C. N. Yang, director of the Institute for Theoretical Physics, State University of New York, Stony Brook.

• **SAIGON MEDICAL SCHOOL**: Hobart A. Reimann, professor of medicine at Hahnemann Medical College and Hospital of Philadelphia, has taken a 6-month leave of absence to serve as field director to help in the reorganization of the medical school program at the University of Saigon. The project is sponsored by the Agency for International Development and the American Medical Association Project for Medical Education in Vietnam. Before Reimann joined the Hahnemann faculty in 1960, he held a number of consultant and faculty posts at foreign medical schools, including Peking/Union Medical College in Peking, the American University of Beirut, Lebanon medical school, the University of Indonesia, and the University of Shiraz, Iran.

• **INSTITUTE FOR EYE RESEARCH**: Senator Lister Hill (D–Ala.) has introduced a bill (S. 325) to establish a National Eye Institute within the National Institutes of Health. The bill, which is identical to legislation that was introduced both in the House and the Senate during the closing days of the last session, would create a separate Eye Institute for the conduct and support of research and training relating to blinding eye diseases and visual disorders (*Science*, 29 July 1966). The bill was referred to the Committee on Labor and Public Welfare where hearings have not yet been scheduled.

• **PRE-COLLEGE SCIENCE EDUCATION**: The National Science Foundation is asking for grant proposals for experimental projects designed to improve pre-college science and mathematics education. Institutions eligible to submit proposals include universities and 4-year colleges, associations of professional scientists, and nonprofit research organizations. Proposals may be submitted at any time but at least 4 months must be allowed for evaluation and processing. More information is available from Special Projects in Pre-College Science Education, Division of Pre-College Education in Science, NSF, Washington, D.C. 20550.

• **LOAN AIDS INDIAN SCIENCE EDUCATION**: A $12-million loan to finance the purchase in the United States of equipment needed in India for new methods of teaching science, mathematics, engineering, and technology has been announced by the Agency for International Development. A portion of the equipment will be used in support of Summer Science Institute programs, which have been held annually on a trial basis since 1963. The program is being carried out with the assistance of the National Science Foundation.

• **CHESAPEAKE POLLUTION LABORATORY**: Secretary of the Interior Stewart L. Udall has announced plans to establish a Chesapeake Basin Water Laboratory which will serve as a focal point for coordination of programs to reduce pollution in the Bay. The laboratory was authorized under a 1961 amendment to the Federal Water Pollution Control Act which directed the Interior Secretary to establish at least seven field laboratories and research stations for study of water pollution. The facility will serve as a center for the Water Pollution Control Administration and for coordination of both federal and state programs to achieve high water quality for the Bay and its tributaries. The site of the laboratory has not been determined although Udall indicated that it would be located in the southern Bay region.

withering away of their profession. Robert W. Meyer of the University of Illinois concluded that 'academic attention to public utility economics in the form of scholarly articles clearly has dwindled almost to the vanishing point.' " Columbia University, the authors note, offers courses "ranging from Urdu to 12th-Century French lute music" but dropped the course in public-utility economics upon the retirement of the professor who had taught it.

Metcalf and Reinemer believe effective regulation will be even more important to ratepayers in the future than it has been in the past, for they foresee a trebling of the use of electricity by 1980. Electricity is being used to heat more and more homes, and some utility officials predict that electric heating eventually will predominate. Given the growing threat of air pollution, electric cars may in time come to replace many of the gasoline-powered automobiles now fouling the air. Moreover, the general growth of the U.S. economy and population will place enormous additional demands on the power industry.

One can only speculate whether *Overcharge* will stir the wide public interest in utility regulation for which the authors are hoping. The success of other recent muckraking books such as Ralph Nader's *Unsafe at Any Speed* and Jessica Mitford's *The American Way of Death* would seem to be a good omen. Regardless of whether *Overcharge* makes the best-seller list, it seems certain that the utility industry's carefully cultivated Reddy Kilowatt image of bright innocence is likely to be tarnished. Metcalf will be using the Senate floor and committee rooms to illuminate what he regards as Reddy Kilowatt's darker side.—LUTHER J. CARTER

Grand Canyon: Udall Drops Controversial Dam Proposal

Conservationists scented a victory last week when Secretary of the Interior Stewart L. Udall announced that the administration was dropping its proposal to build a hydropower dam in the Grand Canyon. In fact, implications of the administration's decision may go beyond the Grand Canyon dam issue (*Science*, 17 June 1966). Udall indicated that the Department of the Interior is developing a more flexible approach to water resources development.

For years it has been the policy of the