



On Leaving the AEC

THIS I DO BELIEVE. By David E. Lilienthal. 208 pp. Harper and Brothers, New York, 1949. \$2.50.

"For almost twenty years," says David Lilienthal in the foreword to this book, "it has been my job as a public servant to try to translate what we say about democracy into what we do. Day in day out I have had to face the practical question: How can this or that thing get done, not only for a democratic purpose but perhaps more important, in a democratic way?" In the chapters that follow are sketched from this background of experience the bold outlines of his own thoughts about democracy and how it may best be made to work.

The unifying thread winding through these chapters (essays might be the better word) is double stranded, one strand being his faith in the ability of free men to meet and to solve problems separately as they arise, the other being his faith in democratic action as insurance that this ability may extend into the future. The problems and the dangers facing us are real, he says, and one should not attempt to minimize their importance; but the strength of America lies in a capacity to treat new situations individually and without having to resort to standardized formulas for action.

The optimism he expresses for the future is qualified to this extent, however: he accepts as gravely serious the possibility that in taking steps to meet the (real) threat of communism "we may imitate that very regimentation of thinking, and that very domination of private affairs by politicians and political methods against which we have set out to fight. We are fearful when (in the very first years of what will be a long contest) we observe here at home a tendency toward the enforcing of orthodoxy of thought and toward increasing governmental inspection of opinions and of private lives."

It is in the conflict between these quite opposite tendencies—the world of the system, of the formula, of dogmatism versus that of diversity of opinion and approach, where ethical standards are reached by the affirmation of compromise as a common rule—that Mr. Lilienthal becomes most eloquently persuasive and most convincing. In a swift succession of chapters he delivers himself of a completely absorbing set of closely interrelated attitudes towards the moral and economic and spiritual and material patterns of democratic activity. But these are rather to be read verbatim than in paraphrase.

A Washington correspondent has called this book the longest letter of resignation ever written in the Capital, which is, of course, one way of looking at it. Certainly its timing lends a significance reaching even beyond its importance as the clearly enunciated credo of a widely respected public servant, for it was followed shortly by the author's retirement after a storm tossed career as

chairman of the United States Atomic Energy Commission. Somewhat more likely by coincidence, it also closely preceded the resignation of former Secretary of the Interior Julius Krug, who had been chief power engineer for the Tennessee Valley Authority under Lilienthal before the war. Like Lilienthal, Krug believes strongly in the value of publicly controlled regional developments (TVA being the laboratory model) as a means of husbanding national resources and of insuring the health and the welfare of regions—and thus of the nation as a whole. Until they resigned they were, moreover, perhaps the most vigorous remaining exponents in official Washington of the idea that decentralized administration is a desirable alternative to "Big Government."

The concept of decentralization in government, which is related strongly to the aphorism "That government is best which governs least," rests upon a belief in responsible citizenship and in the greatest possible degree of co-operative effort among individuals within the framework of a democracy. Fundamental to this is Mr. Lilienthal's conviction that it is the moral obligation of each man to "be an active, living part of the times," while it is the obligation of government to encourage this willing activity and to make it meaningful and productive by insuring that responsibility for public enterprise be shared to the greatest possible extent. Widespread, voluntary, co-operative participation by qualified individuals in public life ("Universal Public Service"), Mr. Lilienthal suggests, may materially alter the present trend towards an over-centralized administration of government policies—a trend that is being illustrated by various demands by Congress for more part in the administrative functions of government.

The manner in which the policies and the functions of TVA have been carried out through the media of local agencies rather than by means of a topheavy central management has demonstrated that the principle of decentralized administration has worked successfully in at least that one major public enterprise. It is Mr. Lilienthal's point that if this could be done in the case of TVA it can also be done in other agencies of the government. There is no conflict, he remarks, between a high degree of centralization on the policy level and a distribution of authority for carrying out policy decisions; the need for consistency in formulating policy usually demands a central authority, while to entrust the execution of policy to a central and often geographically removed and statistically motivated authority is a dehumanizing force.

It is in this connection, of course, that the matter of the Atomic Energy Commission comes up, for more than being a major administrative problem, and one with which Mr. Lilienthal is familiar, it is very nearly unique in not being found amenable to those standards common to most other public developments. In spite of this, Mr. Lilienthal makes clear, the AEC is administered through regional offices which act generally to supervise the activities of individual contractors, which in turn have as much freedom in administrative function as the interests of national security can legitimately permit.

But at this point Mr. Lilienthal again tempers opti-

mism. Shortsighted maneuvers by Congress pose a threat to our ability to maintain leadership in nuclear engineering, which is a development that can evolve in a satisfactory manner only by being able to attract competent technical personnel. "If low salaries, lack of tenure, and occasional intemperate attacks were the only things to be borne they would not in themselves raise such a serious question," says Mr. Lilienthal. "The difficulties, however, are more fundamental. They consist in the growing evidence that a tendency toward detailed Congressional supervision of this and other essentially technical undertakings makes the doing of a creditable job quite impossible."

Those who have in the past disagreed with Mr. Lilienthal and TVA are perhaps not likely to be won over suddenly by what he has to say here; but for those who do agree and who have followed his career with appreciation and respect, the book will be of interest as a careful statement in review of those principles which he believes to be most important to the healthful continuance of a functioning democracy. RRD

Combustion Research

THIRD SYMPOSIUM ON COMBUSTION FLAME AND EXPLOSION PHENOMENA. 748 pp. Williams and Wilkins Company, Baltimore, 1949. \$13.50.

Anyone who has ever worked with internal combustion engines—whether of the reciprocating or turbine type—knows that the greatest problem facing the designer and the theoretical investigator is one of fuel combustion. Not only do the actual combustion and flame propagation present enormous difficulties but they lead to other complications in the method of injection and ignition of the fuel. Therefore there has been, and is, no real isolation of the problem.

The present volume, containing the collected papers of the third symposium on combustion flame and explosion phenomena (held at Madison, Wisconsin in September of 1948), represents a rather sweeping survey of the field, both theoretically and experimentally. A total of one hundred papers is included under eleven major headings, with the largest number appearing in the group, Kinetics and Mechanism of Combustion Reactions.

Exactly what happens inside a cylinder in which an explosion occurs has long been fascinating. Pictures have been taken and studied in minute detail but pre-ignition and unequal distribution of temperature and pressure still dog the footsteps of the investigator in this field. Despite the experimental evidence—which is all too sketchy—and the shrewd guesses of many theorists, the inside of any combustion chamber still remains a great mystery.

It is safe to say that carburetion and ignition gave more trouble to engine designers during the last war than other single items of design. When the reciprocating engine was deserted for the turbo-jet, ram-jet, and other types, the problems of combustion trotted right along. Keeping the fire going at an even rate is of fundamental importance, and is still to be completely settled. Whereas there were volumes written on compressors and turbines there was almost nothing written on combustion

chamber design and less on research in this field. Therefore the present volume takes on added importance because it puts another sorely needed book on a shelf which is too bare.

But lest the impression be given that combustion is important uniquely in the field of engine design we need only recall that combustion is of essential economic and physical (in the sense of health) importance to everyone who must use a source of heat other than the sun to warm his house. When on top of this it is remembered that liquid fuel supplies in the United States are dangerously low, then we see the added significance and need for knowledge concerning efficient combustion and flame propagation. Not only is this field of research of essential importance to many other fields but it also happens to be the field which, above any other known to the writer, has been most consistently neglected over the years. In an entirely different connection the necessity for greater knowledge concerning explosion and combustion phenomena is illustrated: namely in human safety. It is more than coincidence that many of the outstanding men in the combustion field are members of the scientific staff of the Bureau of Mines.

Obviously it is impossible to review a collection of one hundred learned papers in any space that a journal can reasonably allot. However, it might be of some interest and value to list the headings of the eleven divisions. They are: Flame Stabilization and Quenching; Flame Propagation in Explosive Gas Mixtures; Flames of Fuel Jets; Ignition of Gas Mixtures; Kinetics and Mechanism of Combustion Reactions; Flame Spectroscopy and Radiation; Burning Detonation of Explosives; Thermodynamics of Flame Gases and Thermochemistry; Experimental Techniques; Combustion in Engines and Rockets; and Gas Burners and Furnaces.

The volume is especially noteworthy as an example of excellent editing and publishing. All too frequently published collections of papers originally read at the meetings of learned societies give an impression of extreme haste and carelessness, as though the editor had placed the papers in the volume just as he had received them across his desk and without regard to their proper order within appropriate subject categories. No such charge may be made in this instance. Workers in this field, whether physicists, chemists, or engineers, will find this a useful book to have around. It may not answer all or even a majority of the questions likely to arise, but as a survey of the present state of knowledge it will be a valuable supplement to other kinds of research apparatus.

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Guessing Game

STOCHASTIC PROCESSES AND THEIR APPLICATION TO THE THEORY OF COSMIC RADIATION. By Niels Arley. 240 pp. John Wiley and Sons, New York, 1948. \$5.00.

An English translation of a Danish thesis first published in 1943, this book deals with the important problem of providing a mathematical theory of some aspects of cosmic ray showers. When a primary electron enters a layer of matter it has a chance of emitting a photon