



BOOKS

Democratic Strength

MODERN ARMS AND FREE MEN. By Vannevar Bush. 273 pp. Simon and Schuster, New York, 1949. \$3.50.

If the uneasy progress of the cold war has given rise to any single well formed popular desire, it is that some convincing assurance be given that the present world armaments race shall not end in world disaster. It is the point of Vannevar Bush's book that disaster is unnecessary, that the democratic people, by acting wisely and with courage, have within their grasp the means (technical and otherwise) to make the future bright even in the midst of an armaments race. It is a comforting conclusion, and because Dr. Bush has had an opportunity to see perhaps with better perspective than any other person the overall picture of scientific warfare, and therefore to understand its dangers, it is a conclusion that carries weight.

Dr. Bush bases his argument upon two major premises. The first of these is that "the technological future is far less dreadful and frightening than many of us have been led to believe, and that the hopeful aspects of modern applied science outweigh by a heavy margin its threat to our civilization." In elaborating, he predicts that the defensive arts in warfare, rather than falling still farther behind the offensive, will become increasingly more effective and will soon regain the ascendancy held by the defense in the first world war. He bolsters this by a critique of the various offensive techniques used in the last war. In a thorough, step-by-step discussion of each he depreciates the potential effectiveness of airborne assault operations, the high altitude bomber as a means of delivering atomic or other weapons, the great ships of the Navy, and the several forms of subversive attack, including biological warfare. His one major concession to the offensive is his unqualified respect for the snorkel-equipped submarine, and he makes the blunt point that the Navy's primary responsibility should be to meet this threat.

The second premise is "that the democratic process is itself an asset with which, if we can find the enthusiasm and the skill to use it and the faith to make it strong, we can build a world in which all men can live in prosperity and peace." The continuation, which gives eloquent testimony to Dr. Bush's personal convictions, is perhaps most interesting as it becomes a critical evaluation of the respective abilities of democratic and totalitarian systems of government to compete on a technological level. Dr. Bush has no doubts on this score, expressing a firm belief that the technology of a dictatorship, trapped within the narrow vacuum of state politics, cannot compete in the long run with the scientific freedom of a democracy. "This does not mean," he cautions, "that we can flatly disregard the Communist state and cease our

advances in the techniques of war. The Communists can copy and improve, and a whole mass of scarcely developed techniques remains from the last war as material for this process. It does mean that we must continue to break new ground, and that we can do so with our heads high, for we have a system essentially adapted for the purpose, if we do not distort it or sacrifice it to false gods of fancied efficiency."

In spite of this reference to breaking new ground, Dr. Bush's forthright extrapolations over immense and uncharted distances seem to depend very largely upon an orderly development everywhere of military applications along already established and familiar lines. At face value, any prediction of an extended offensive-defensive stalemate in a world crowded with secret laboratories dedicated to the science of war would seem unrealistic and risky. Dr. Bush lists numerous attack methods which he agrees are capable of inflicting, under favorable conditions, great damage and many casualties, but somehow he finds comfort in the fact that none by itself is now an absolute and decisive weapon. Nor is it altogether reassuring to be led through an involved argument suggesting that the immense threat of biological warfare may be to some considerable extent minimized because "somewhere deep in the race there is an ancient motivation that makes men draw back when a means of warfare of this sort is proposed."

Yet the panorama that Dr. Bush presents is so sweeping and so comprehensive that it is misleading to examine it piecemeal; its object is to explore all elements of the national strength, and this he does in a compellingly individual manner. His remarks concerning the ideal political objectives of the ideal democracy may not meet with uniform agreement, but they will command attention because they are reasoned and articulate and forceful; neither can his commentary on education be taken lightly, for he is challengingly direct in calling for the immediate reexamination and remedy of outworn notions and practices.

Above all this is a book rooted deep in the conviction that progress is good, that the democratic environment is uniquely favorable to progress, that the future is unmistakably in our hands to do with as we will. R.R.D.

Essentially Applied

ACOUSTIC MEASUREMENTS. By Leo L. Beranek. 914 pp. John Wiley and Sons, Inc., New York, 1949. \$7.00.

Dr. Beranek, who is technical director of the MIT Acoustics Laboratory, has written a useful book. He intends it for one thing as a reference volume for graduate students and research workers in the field of acoustics, but more than that the book was conceived as an aid to acoustic physicists interested in fundamental measurements, to communication engineers concerned with the performance of audio communication systems, to psychologists working in the field of hearing, to otologists studying hearing defects, and finally, to industrialists applying acoustic measuring techniques in manufacturing processes.