Books

EDUCATION IN A DIVIDED WORLD

by James Bryant Conant
Harvard University Press, 249 pp. $3

by Hunter Mead

Professor of Philosophy and Psychology

In this, his latest discussion of education in America, Harvard's distinguished president continues to increase his stature as a leader of educational thought in this country. In some ways the present book is more controversial and radical than any of Conant's previous writings on this subject—so radical in fact that one may expect to hear its author accused of "treason to his class" in the same way President Roosevelt was accused by many of his upper-class opponents. For here Conant acknowledges the civil war that has long plagued American education—the fight between the public school people on one hand and college and university educators (aided by administrators of the private preparatory schools) on the other. Then, having admitted that the warfare exists, and can no longer be considered as merely a family quarrel, Conant takes sides with the public school men. He feels that they—and not their opponents in the colleges and universities—have their feet on the ground, and their eyes on the guiding star of the democratic ideal.

To the present reviewer, this is the best evidence of Conant's capacity for growth and independent thinking. The fact that Conant is not only the head of America's Exhibit A in private educational institutions, but himself a product of the system he attacks in this book, certainly disproves the old saw that the thinking of every man is bound by his background and economic supports.

The title of this book is somewhat misleading, for the problem of education in a world split by rival ideologies is discussed specifically in only two chapters. The real subject is education in a modern democracy, although probably everyone would admit that this has close relation to the ostensible theme of the book. The subtitle gives the best indication of Conant's concern: The Function of the Public Schools in Our Unique Society. In his former writings he has considered advanced education in America, but here he concentrates on the high schools and junior colleges.

No complaint is voiced more often by college and university professors than the one that the high schools are not preparing their students for college—or, in the usual words of these professors, "We have to spend much of the first two years of college work giving the student what he should have got in high school." But, argues Conant, preparation for college is **not** the primary function of our public high schools, and hardly even a secondary function. For the majority of students who graduate from high school never even start to college—and never intend to.

In the nation as a whole, out of every 1,000 children in the fifth grade, only 770 enter high school, and only about half (417) of these graduate. Of the 417, only 146 begin college, and again only half of these graduate from college. Thus some fifteen percent of the fifth-grade students will begin college; about eight per cent graduate; in terms of those entering high school, just over one-fifth will try college at all—and only one-tenth will graduate. Yet, as Conant repeats again and again, college educators persist in believing that the public schools exist largely to prepare students for college!

Conant agrees with the public school administrators that the primary function of their institutions is the preparation of children for citizenship, and social and personal adjustment. Even more radical is his opinion that by and large the high schools of America are doing a commendable job along these lines, and that the constant sniping at the public schools indulged in by many college and university people is viciously unfair—not to say ineffectual.

This brings Conant to the inevitable question, Who is going to prepare the student for college—other than the expensive private prep schools? His answer is definite: in our unqiue society this must be the task of the public high schools (aided by the junior colleges), but not as they are now organized in most school systems. He would reorganize their work around a core of general education, emphasizing three areas: the humanities, the social studies, and the natural sciences. Conant believes the needs of our democratic society can best be served by requiring a judicious balance of work in all three—but he emphasizes repeatedly that the appeal should be to the student's innate curiosity rather than to social pressures such as future college entrance. For the gifted students (and Conant implies that they are the only ones in the public schools who should be encouraged to go to college), there would be extra studies intended as college preparation. He insists, however, that such work should be controlled by every possible means to prevent social discrimination or intellectual snobbery.

Federal scholarships--the democratic way

The most radical part of Conant's general proposal —or at least what would have seemed unthinkably radical ten years ago—is that calling for Federal scholarships on a large scale to permit gifted students to continue beyond high school. He argues for this aid on the grounds of both democracy and a fuller use of our human resources. Again he quotes some shocking figures to prove that the smug claim, "Any American student can get a college education if he really deserves it," is a myth without foundation. He shows the amazingly close relation between family income and college attendance, and feels that unless drastic changes are made we will gradually harden into a class-stratified nation.

Conant does not propose that only the really capable should go to college, but he insists that no one who is capable should be excluded from advanced education by economic barriers. If we continue to let these barriers be the primary determiner of whether or not a student goes to college, Conant believes we not only will weaken the nation, but will provide our ideological rivals across the ocean with abundant ammunition for their propaganda claims that America is not really democratic.

ROCKET PROPULSION ELEMENTS

by George P. Sutton '42
John Wiley & Sons, New York 294 pp. $4.50

by H. S. Seifert
Lecturer in Jet Propulsion

THIS COMPACT LITTLE BOOK, illustrated with style, presents, as its title suggests, the basic facts of rocketry in easily assimilable form. It has chapters on basic concepts, history of rockets, thermodynamics of nozzles, properties of liquid propellants, liquid rocket motor design criteria, propellant feed systems, flight performance, static testing, and solid propellant rockets. The necessity for condensing the material of a very broad subject occasionally means that the treatment is qualitative or even superficial; however, the concepts are clearly expressed.

The author's background has been largely in the liquid propellant field, so the emphasis is on liquid rockets—with 45 per cent of the paging devoted to specifically liquid techniques as compared with 5 per cent devoted to solid propellant techniques. It is regrettable that for security and other reasons more attention could not be given to solid propellants, which show promise of increasing importance in the future.

Sutton's writing style is fluent and his organization systematic, making the text easy to read. This reviewer found himself somewhat startled to see on page 135 a picture of a motor, to the design of which he had contributed just a few years back, labeled "Early American Rocket Motor." Apparently the ox-cart is no more obsolete that last year's rocket motor! On page 132, under "Combustion Process," the statement is made that for the oxidizer and fuel fluids, "in no case does any large part of the reaction take place in the liquid phase." It is the opinion of some workers in jet propulsion that this statement is incorrect.

This volume brings into the public domain some of the material of "Jet Propulsion," a restricted text which has been used in the Institute course in rocket systems since 1943. It should be quite helpful to those engineering students who wish to acquire perspective and physical feeling for liquid propellant rockets.

ROCKETS, GUNS AND TARGETS

Edited by John E. Burchard
Atlantic-Little, Brown: Boston 482 pp. $6

by H. S. Seifert

THIS INTERESTING SOURCE BOOK—one of the eight-volume series, **Science in World War II,** which records the history of the Office of Scientific Research and Development—should be of special value to Caltech readers, since the list of contributors sounds like an alumni-faculty roll call. Eleven of the thirty-six chapters are devoted to work done at the California Institute of Technology.

Rockets, Guns and Targets describes the work of three of the nineteen divisions of the National Defense Research Committee—Division 1, Ballistic Research; Division 2, Structural Defense and Offense; Division 3, Rocket Ordnance. The book, in a sense, complements **Rocket Propulsion Elements,** reviewed above, since it describes the applications of research on solid-propellant rockets rather than liquid-propellant rockets. It is, however, non-mathematical and descriptive, almost narrative in form.

George P. Sutton '42, author of "Rocket Propulsion Elements," is supervisor of Propulsion Development for North American

The Caltech work on Rocket ordnance makes not only impressive, but stirring reading. Substantially all rockets used by the Navy were developed here—the main ones being the anti-submarine, the 4½-inch barrage, the spinner, and the forward-firing aircraft rockets. When the war ended, the Navy had contracts for rocket ordnance, with regular contractors, at the rate of $150,000,000 a month—all the rockets having been developed at the California Institute of Technology. With Charles Lauritsen as Director of Research, and E. C. Watson as administrative head, Caltech's rocket contracts totalled $80,624,000 altogether.

The book contains detailed lists of the personnel of various projects, and you will find many of your friends, and former professors' names here. (It is not intended, of course, that a distinction between professors and friends be implied.)

A blend of physics, battle incidents, tactics, and politics combines here to make exciting reading. The text is charged with feeling and gives one an appreciation of the vitality and urgency of the research and the vision and courage of the men who were prosecuting it. One seems to catch an echo of the spirit of the Pilgrims, Bunker Hill and the '49ers. Here indeed is an intimate chronicle of the physicists' war.