and extensive observations. This has frequently happened in the past.

The basic question raised in this book, and the one that provides the title, is whether the ultimate responsibility for education should rest with the state, the parent, or the child. Traditionally, in our society, the parent has been responsible, although the state has long required him to send his child to some kind of a school. But during the first half of this century, with the coming of the elective system and the increased permissiveness of parents, more and more responsibility has been placed on the student to choose his own path. The result has been that many able students chose the easy subjects in high school and some dropped out of school before their talents had been fully developed.

"World War II," says Conant, "provided the first shock to citizens and to educators who started from the premise of the independence of each child if not of each parent. What was accomplished or not accomplished in school or college obviously did have a great deal to do with winning the war in the shortest time and with the minimum expenditure of lives. There was, for the time being at least, an overriding state interest. . . ."

The launching of the sputnik and the development of intercontinental ballistic missiles by the Russians aroused fresh public interest in the quality of our education, and it now seems obvious to many Americans that our national survival, as well as social progress, requires that talented students be educated to the upper limits of their abilities. In the secondary school Conant proposes a rigorous academic program for these students, but who is to require that they take it? His conclusion is that such a program should be made available, but that "There is no way in a free country by which organized society can *require* bright students to study hard. . . .A climate of opinion must be created which brings forth in each young person a strong desire to do his or her best in school. Then the school must, in turn, provide the challenging courses and provide a variety so that not only the academically talented but all pupils will feel their studies are worthwhile."

Such a climate of opinion might seem to require a deemphasis on nonintellectual and recreational activities in the school. Gresham's Law works in education as well as in economics, and one way to keep students out of soft courses and time-wasting activities is to not make them available. But Conant proposes no such deemphasis. He wants an even greater variety of offerings to meet the total range of abilities and interests, and a still greater variety of vocational courses. He counts on improved guidance programs to keep talented students out of the soft courses and the inappropriate vocational courses.

None of Conant's proposals are very revolutionary, nor, apparently, are they intended to be. His program for the talented 15 percent is not greatly different from that long recommended for admission to the more selective colleges, except that Conant proposes four years of mathematics and four years of a single foreign language. He gives little special attention to the large number of students who fall below the upper 15 percent, but who, nevertheless, will go to college. This is a serious omission for already well over 30 percent of high-school graduates go on to college, and the percentage rises each year. It seems unwise to encourage, or even to allow these students, many of whom will enter teaching or other professions, to take easy courses or vocational courses in high school. Conant's proposed required program for the less talented 85 percent is similar to that now required in many high schools: four years of English, three or four of social studies (including two of history), one of mathematics, and one of science, with the remainder of the time to be filled in with electives, including vocational courses. His emphasis on ability-grouping is sound, but this, too, is now found in many schools, and the practice is spreading.

While Conant calls for "immediate action to improve the high school," he believes that "The road to better schools might be considered merely a widening, straightening, and improvement of the present rather overgrown and winding lane along which most children wander." This will give comfort to many who have defended the present system, or lack of system, for it suggests that nothing really basic is wrong and that all necessary improvements can be made without a change in the present pattern of education.

The question must be asked whether Conant's proposals really get to the heart of the problem of educational quality. He is right in saying that we cannot adopt any European system, that we must work within the framework of our own form of democracy and must provide for the full range of individual differences. But some of us who have struggled with these problems for many years are convinced that merely "widening, straightening, and improving," is not enough: we are convinced that the time has come for a more thorough overhaul that will include the junior as well as the senior high-school, provide for better articulation of secondary education with that which comes before and after, and prepare bright students for college a year or two earlier.

The changes that are needed, and in all probability soon will come, will go far beyond the Conant proposals and will include improvements in the teaching-learning process, as well as changes in school organization. They will include a reallocation of space, time, and personnel in the schools, the introduction of team-teaching, more and better instruction by television, and the use of teaching machines where appropriate, so that the teacher's time can be used more effectively. These changes will provide better education for the rural child without requiring him to spend many futile hours each day on a school bus.

New and better kinds of teachers will be necessary, and these will be developed through improved approaches to teacher-education, including the Master of Arts in Teaching program which Conant himself introduced when he was president of Harvard.

If this vision of the future becomes reality, Conant's proposals for the improvement of the American high-school will, by 1970, seem modest indeed. But *The Child, the Parent, and the State* will long be read as a wise and scholarly analysis of the problems of secondary education in a democracy.

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Tree Maintenance. P. P. Pirone, Oxford University Press, New York, ed. 3, 1959. xviii + 483 pp. Illus. $10.

P. P. Pirone is well qualified to present tree maintenance in a comprehensive manner. He has a background as a scientific investigator in plant pathology, and he has also maintained close contact with professional arborists. First published in 1941 as *Maintenance of Shade and Ornamental Trees*, this third revised edition is an excellent reference for the

student, home-owner, nurseryman, landscape architect, and professional arborist.

General maintenance practices are brought up-to-date in part 1. Topics such as soil, transplanting, fertilizers, pruning, treatment of wounds and cavities, and bracing are adequately covered. Major revisions have been made in the chapter on trees suitable for various locations; tall-growing trees are given only passing attention, and more emphasis is placed on low-growing trees suitable for use about low, modern homes and also for streetside plantings.

Specific abnormalities of trees are discussed in part 2. Three main chapters deal with the diseases and insect pests that attack low-growing, tall-growing, and evergreen trees. Each group of trees is arranged in alphabetical order according to the common names. The diseases are presented in logical order—symptoms, cause, and control. Next each insect pest is identified by a description of its damage to the tree and a brief description of the various stages of development. The description is followed by a discussion of appropriate control measures. New diseases and insect pests and the latest methods of controlling them are included.

A new topic is presented in the appendix, which should appeal to professional workers. It is a method for evaluating shade trees from a monetary standpoint adopted by the National Shade Tree Conference and the National Arborist Association in 1957. This is followed by a 19-page, selected bibliography that is especially useful to the student.

Pirone has successfully presented his subject in a manner midway between the technical and the popular levels of presentation.

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Radiation Hygiene Handbook. Hanson Blatz, Ed. McGraw-Hill, New York, 1959. 926 pp. Illus. $27.50.

Hanson Blatz writes in the preface of this *Handbook* that it is the first comprehensive handbook in the field that they chose to call "radiation hygiene" and that the handbook has been dependent upon the contributions, advice, and inspiration of many of the American leaders in this "relatively new branch of science."

The new description of the field as "radiation hygiene" seems very opportune and is a good substitute for the less apt term "health physics" which, if we consider the meaning of "physic," seems at times to be somewhat more appropriate to the field of patent medicines. Disappointingly, however, the information in the handbook seems sometimes to be insufficiently up-to-date to do justice to the newness of this "relatively new branch of science," but this is probably due to the delays that are inevitable in publishing a large and comprehensive work. It is, however, somewhat incongruous to find 102 pages devoted to nuclear data tables "based principally on the work of J. M. Hollander, I. Perlman and G. T. Seaborg" which appeared in *Reviews of Modern Physics* in April 1953 when a very full and complete revision of that work appeared in the same journal in April 1958. Nor is any reference made to the intervening encyclopedic publications of the Nuclear Data Group of the National Research Council (K. Way, C. L. McGinnis, *et al.*).

In the table on fundamental constants in the section entitled "Reference data," it is curious to find the "rutherford," which was stillborn some 9 or 10 years ago. In passing, one might question the validity of including quantities such as the roentgen and curie (and even millicurie and microcurie) as *fundamental constants* along with Avogadro's number, Planck's constant, and the velocity of light.

Apart, however, from the shortcomings of which the foregoing are examples (doubtless they are due to the time elapsed between setting pencil to paper and the ink drying on the printed page), this volume contains a wealth of information in its 23 sections which range from "Exposure standards and radiation protection regulations" through "Interaction of radiation with matter" and "Radiation attenuation data" to "Liquid and solid waste disposal" and "Personnel control." Sections are also devoted to sources of radiation (including natural and artificially induced radioactivity, particle accelerators, and reactors), radiation detection and measurements, and applications to industry, research and medicine. Each section of the book is contributed by an authority in his field.

One omission is, however, noteworthy. In the descriptions of counting equipment much space is devoted to how counters operate but none at all, as far as I can determine, to how to use them. Thus, references are made to the efficiency of counters and formulas are quoted which include efficiency terms, but no clue to the determination of efficiencies is given, nor, indeed, is any difference drawn between geometric and intrinsic efficiency. Such efficiencies are normally determined by the use of radioactivity standards, but a careful search of the subject index and of the most likely parts of the text reveals not one single reference to radioactivity standardization. This is a topic that might well have merited a section of its own, when one considers how the older field of health physics depended so much on radioactive metrology.

That this new and interesting book will be of great value cannot be doubted, and it will be a most valuable asset for any radiation laboratory. It may, however, be of more use to the experienced radiation hygienist, who already knows his way around the field, than to the beginner. There is much that will be of value to the beginner, and the book is stimulating enough to make one look forward to the second edition which could well prove to be a much needed work of authority for all workers, both inexperienced and experienced, in radiation hygiene.

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J. M. Charcot, 1825–1893, His Life—His Work. Georges Guillain. Edited and translated by Pearce Bailey. Hoeber, New York, 1959. 202 pp. + plates. $7.

This is a pleasant little book with a Gallic flavor that is maintained in the translation and with a binding that attracts the eye and hand. How nice to see a little gilt filigree on a cover again.

This is the first English biography of Jean-Martin Charcot, father of modern clinical neurology and one of the medical luminaries of the 19th century. Charcot belongs to that select group of clinicians who have advanced medicine through meticulous, persevering observations of patients throughout the course of their illness and on to autopsy.

Charcot was fortunate in his environment. His work was his life, and he was not disturbed in his pursuits. A proud Parisian, he made the collection of human discards at Salpêtrière his