Books

They Went to College Early: Evaluation Report No. 2. 117 pp. The Fund for the Advancement of Education, New York, 1957. Paperbound. *Reviewed by R. W. Hellwarth, Hughes Aircraft Company.*

Of the various shortcomings in the American educational system, perhaps the most tragic is the often needless waste of the intellectual potential of the country's ablest youth. It was in recognition of this particular weakness that the Ford Foundation's Fund for the Advancement of Education inaugurated and supported a broad experimental program to explore and test ways a) to increase flexibility in educational programs to accommodate the divergent needs of the gifted student and b) to eliminate the lack of continuity in various stages of the educational structure where for one reason or another the student may be forced to miss certain areas, stand still, or even repeat previous work. Approaches to the problem have taken the form of five projects: integrating curricula among certain colleges and preparatory schools, enrichment of courses for superior students at the high-school and at the college levels, increasing the flexibility of early college work to prevent duplication and unchallenging work, and finally, the early matriculation of carefully selected students with high academic promise. It is with the results of this latter experiment, the Program for Early Admission to College, that the present book is concerned.

The purpose of the program was to ascertain and evaluate the benefits and the risks involved in helping a total of some 1350 scholars to free themselves from the ordinary "lock step" educational process by entering college one or two years early. These scholars were entered over four classes (1951–1955) at twelve colleges. This report, though not preliminary, deals primarily with the results only of the two classes who had graduated by the summer of 1956. The evaluation has been carried out with the aid of detailed records of the scholars and comparison students kept by the colleges, questionnaires answered by the scholars at graduation, an appraisal of the social and emotional adjustment of the 1951 scholars made by a team of trained psychiatrists, an analysis of essays written by the scholars just prior to graduation, and interviews with comparison students, families, and high schools.

The scholars, the colleges, the independent professional consultants, and the Fund all consider the Early Admission Program to be generally successful and to constitute a promising approach to the problem of enabling the able student to realize his full potential. The

risks and difficulties, as well as the advantages, as viewed by these several groups are well summarized in this Fund report, and much of the raw data and "laboratory" conditions are recorded as well.

The future of the "Fordies" and their successors at present seems bright. Already eleven of the twelve participating colleges have incorporated the early admission idea into their regular admissions policy and several dozen other accredited institutions have similar programs. Whatever the eventual outcome of these programs, the early admissions idea certainly deserves the attention of educators and parents.

They Went to College Early presents this idea with all its most important ramifications along with much that will contribute to any reader's intelligent evaluation of this promising innovation in our educational structure.

Quantum Mechanics. By H. A. Kramers. 496 pp. (North-Holland, Holland) Interscience Publishers, Inc., New York, 1957. $12.50. (Part 1, *The Foundations of Quantum Theory*. 228 pp. $6.50, issued separately.) *Reviewed by J. Polkinghorne, University of Edinburgh.*

A book on mathematical physics may be said to be written in a spacious style when the passages of continuous prose outnumber the equations. By this simple test the reader of this book is led to expect a full and leisurely development of its subject. He is not disappointed. Kramers used his 496 pages to full advantage in giving an account of quantum theory that is detailed without ever becoming tedious. His approach is semi-historical, which enables him to show clearly how the concepts of the theory arose from experiment. In the first half of the book he lays the groundwork of non-relativistic quantum mechanics, including a long chapter on transformation theory which in its down-to-earth approach makes a good complement to reading Dirac's *Principles of Quantum Mechanics*. In the second half of the book he deals with the relativistic equation of the electron, the exclusion principle, and the semi-classical theory of radiation.

Although this book was written in 1937 very little of it seems dated. The chapter that has suffered the worst in this respect is that which deals with the relativistic equation of the electron. The Dirac equation is not written in its "covariant" form and so there is no discussion of the γ matrices as such. The existence of negative energy states is treated as a great mystery. There is a passing and inadequate reference to hole theory but no reference, of course, to the modern antiparticle treatment of this problem, although the Jordan-Wigner matrices are introduced in the chapter on the exclusion principle.

The translation into English (or perhaps one should say Scots—see page 16!) has been made very smoothly by ter Haar.

This is a book that all who study quantum theory will want to read and all who teach it will want to possess. There is a separate edition of the first five