like many other areas of applied mathematics in which interest has waned (except perhaps from the computational point of view), the determination of the scattering and diffraction of waves has received continual stimulation and interest because of the elegance and depth of the basic equations and also because at each stage the increased understanding of the theory has led to new practical applications which in turn made further demands on the theoretical interpretation. Professors King and Wu have not attempted to write an encyclopedia on this topic. They have rather provided a broad and thorough description of research in the topics of the scattering and diffraction of electromagnetic waves as carried out at Harvard. This has been done in such a way that the results are easily carried over to acoustical as well as electromagnetic problems and the authors have succeeded in illuminating most of the significant aspects of these fields of activity.

One of the valuable aspects of their work is the attention paid to the relation between the idealized and physically realizable problems with special reference to experimental techniques and their theoretical interpretation. The book contains extended discussions of the diffraction and scattering by circular cylinders and this is followed by similar though not quite as lengthy descriptions of the effect of other obstacles (spheres, elliptical cylinders, discs, strips, etc.) and of aperture transmission. The final section of the book is concerned with experimental problems.

Among the features worthy of note are the thorough description of Fock's method and of Wetzel's higher-order approximations.

The authors have been mainly concerned with analytical aspects of the problem and have summarized these felicitously and in a manner which lends itself both to theoretical and experimental application. Symmetry properties and in particular Babinet's principle are only briefly mentioned and problems of finite conductivity are not considered. By virtue of carefully eschewing detailed calculations and by concentrating on physically significant results, Professors King and Wu have produced a book which is valuable both to the worker in the field and to the scientist interested in obtaining a thorough review of it.

American Universities and Federal Research. By Charles V. Kidd. 272 pp. The Belknap Press of Harvard U. Press, Cambridge, Mass., 1959. $6.00. *Reviewed by C. Kittel, University of California at Berkeley.*

THIS book surveys the effect of federal research funds in universities. Mr. Kidd studied government-university relations under a Rockefeller Public Service Award; he is now head of the Office of Research Planning of the National Institutes of Health. His subject is naturally of interest to many physicists. Federal research funds are directly responsible for the great flowering of physics in the United States since 1945. Quite apart from high-energy physics, the resonance and low-temperature fields were developed for many years almost entirely in universities. The gift of independent support to the active vigorous young is probably the main accomplishment of the federal activity. The reader of the *Physical Review Letters* witnesses the high level of intellectual activity fostered by the wide distribution of the means of research. Summer salary support makes academic careers attractive financially, and this form of support has helped build up many faculties.

There is a wide spread in the relative effectiveness of the different federal agencies in research support. Almost everyone can find support. It is not always easy to find support to do the research one wants to do, with no medicine shows, no trumped-up progress reports, no inventories, and no nonsense. Generally speaking, specific programs initiated by the sponsoring agencies appear to have been considerably less effective than those initiated at the working level; the better proposals involve more physics than either real estate or the movements of men on the tides of interdisciplinary fantasies.

The book attempts to document a picture which, at the administrative level, the author quite possibly understands as well as anyone in the country. The documentation is valuable, but at critical points it is sometimes in the form of quotations from unnamed individuals at unnamed institutions. The author could have given, in a single chapter, a penetrating account of the virtues and defects of the research policies of particular government agencies—but he does not do this. Both the government and the scientific community could profit from a franker discussion than we find here.

Electron Physics: The Physics of the Free Electron. By O. Klemperer. 248 pp. (Butterworths, England) Academic Press Inc., New York, 1959. $7.00. *Reviewed by J. Arol Simpson, National Bureau of Standards.*

WHEN an author undertakes to write an undergraduate text on a subject usually covered in several postgraduate courses, he embarks on a dangerous endeavor. Unfortunately, no amount of care or effort on the part of the author and his publisher in providing well-thought-out problems or excellent illustrations can overcome these dangers, as this book illustrates.

There is the danger of excessive condensation; here all electron emission phenomena are covered in a single page. There is the danger of oversimplification; here the focal properties of a uniform magnetic field are derived by inspection from the cyclotron period. There is the danger of quoting results a priori when the connection is not obvious; the Abbe sine condition which is used for the derivation of maximum spot density is applied to electron optics. There is the danger of emphasizing experiments chosen for their ease of comprehension rather than their soundness or historical importance; here the Rupp diffraction from ruled gratings