theory and are not commonly found in other treatments include a discussion of the variation of the eigenvalues, characterization of the spectrum, the distribution of the eigenvalues, and perturbation theory. The last topic is described with special clarity, dealing, among other questions, with transition from a discrete to a continuous spectrum and explaining the significance of the usual perturbation formula in this case. The last chapter, which contains proof of miscellaneous mathematical theorems used in the text, is also distinguished by direct proof of some important Tauberian theorems and a description of Langer's method.

The author states that his work resulted from an attempt to understand those parts of quantum mechanics which can be regarded as exercises in analysis and that the presentation is aimed at mathematicians and not at physicists. Nevertheless, any physicist who has much contact with eigenvalue problems will find that major portions of the book, particularly those mentioned earlier as well as the section describing periodic potentials, will repay careful study. All the more so since the book contains extended discussion of important equations including the hydrogen atom, the Stark effect, the helium atom, and variations of the harmonic oscillator. The book contains a comprehensive bibliography and the typography is excellent throughout.

Optique électronique, Vol. 2. By P. Grivet in collaboration with M. Y. Bernard, F. Bertein, R. Castaing, M. Gauzit, and A. Septier. 339 pp. CNRS & Bordas, Paris, France, 1958. Paperbound. *Reviewed by J. Arol Simpson, National Bureau of Standards.*

In a series of three volumes, Professor Grivet is making available the vast fund of knowledge concerning electron optics that has accumulated at the University of Paris. The first of the series (1955) was devoted to electron lenses and was of interest mainly to the specialist. The third, to be devoted to accelerators and beta-ray spectrographs, presumably will again appeal to a very limited, if enthusiastic, audience. The present volume concerning, as the subtitle indicates, microscopes, diffraction cameras, mass spectrographs, and cathode-ray tubes should interest anyone who uses, or is considering the use of, any of these instruments as well as the active workers in the field of electron physics.

The only comparable American text that comes to mind is *Electron Optics and the Electron Microscope* by Zworykin, Morton, Ramberg, Hillier, and Vance, known affectionately as "We the People" which now, more than ten years after initial publication, is out of date. Actually there is a difference in "feel" in that Grivet, having put most of the mathematics in the preceding volume, can use the additional room to cover the physics of a wider field without being cramped for space.

In this book you will find discussed, besides the more familiar transmission microscope, all three types of electron-emission microscopes: thermonic-, secondary-, and photo-emission with all of their variations; as well as the less familiar ion microscopes, the phase contrast, and reconstructed wave-front microscopes. In these, as in all the discussions, the author is careful to distinguish between theoretical performance, claimed performance, and demonstrated performance. This act alone would rate him the heartfelt thanks of the average experimenter and an especial place in the pantheon of the neophyte.

The discussion of the transmission microscopes leads the author into a discussion of the sources of contrast in the microscopes, which in turn leads him into a discussion of the energy losses in the specimen. It is typical of the detail to be found in the book that he finds space to describe the electron spectrographs that have been used to study these losses and to give an admirably fair summary of the physics of the conflicting theories that have been proposed to explain their appearance.

The chapters on diffraction are equally praiseworthy for he gives not only the more elementary diffraction geometries but the more modern multilens configurations used in present-day instruments. It probably, strictly speaking, does not belong here but even the electron-microprobe analyzer achieves two-page coverage.

Since he has no preceding material to refer to, the chapters on mass spectrographs and especially the discussions of the dispersing prisms are somewhat more mathematical than any of the others. But here again the aim is to elucidate the physics by the mathematics rather than the opposite and where the going gets too tough, as in the aberrations of inflexion focusing, reference is made to the primary article. The emphasis, uniform with the rest of the book, is: what is currently in use, how does it work, how well does it work, and why doesn't it work better?

The authors' long association with a working electron-physics laboratory shows everywhere in pointing up difficulties of technique, disagreement between theory and practice, and personal opinions based on firsthand experience as to preferred solutions to common problems. It is pleasant to be able to feel from a book that the author is an expert in his field and does not have to rely on his reputation no matter how distinguished or well deserved.

The style is admirable for its clarity even to one who is not completely at home in the language, in fact the book would seem to serve admirably as outside reading for a course in technical French. The bibliography of ten pages appears complete through 1955 and less so through 1956; the index is brief but adequate.

My only complaint is that in ten years of active work in electron physics, I am well along towards wearing out my second copy of "We the People". I fear that, admirable as paper binding is from a cost standpoint, a book as useful as this one will have a lamentably short life.