the applied magnetic field is stationary or is varied very slowly. The topics covered are miscellaneous and center about such subjects as the theory of the hysteresis curve, measurements of crystal anisotropy and magnetostriction in ternary alloys, and the permeability and coercive force in the cubic ferromagnetic oxides. The investigation of the magnetic oxides represents the profitable renaissance of a subject that has barely been touched in the past.

The second part, dealing with the dynamics of ferromagnetism, summarizes that class of magnetic properties of steel and related substances which vary with time as a result of the diffusion of the interstitial carbon or nitrogen atoms. One of the most conspicuous of these effects is the decrease with time of the permeability that is observed following a change in magnetization—an effect to which Snoek has given the name "disaccommodation." Snoek presents a closely correlated group of experiments concerning this and related effects and summarizes the very beautiful theory with which he has interpreted the observations.

The third section surveys in considerable detail the properties of the mixed ferromagnetic oxides or "ferrites" which were touched upon in the first part of the book. The influence of temperature and composition are treated. For example, the variation of the Curie temperature with composition is followed for a number of continously varying systems. In addition, there is much magnetic data of technical interest concerning these oxides.

It is safe to say that this small book represents one of the most valuable additions to the subject of ferromagnetism since the volume of Becker and Döring appeared nearly 10 years ago.

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***Nuclear physics in photographs: tracks of charged particles in photographic emulsions.*** C. F. Powell and G. P. S. Occhialini. Oxford, Engl.: Clarendon Press; New York: Oxford Univ. Press, 1947. Pp. xii + 124. $6.00.

One of the oldest and simplest techniques in nuclear physics which has been 'dormant" for many years has suddenly, through some important refinements, come to the forefront of the attention of physicists. Indeed, it has allowed, by the simplest methods, some of the most important postwar discoveries.

The history of the revelation of *tracks* in photographic emulsions is a very old one, going back to Kinoshita in 1909, but before its present blossoming, in part due to the new Ilford and Eastman emulsions, it had not given any results of importance comparable with those reached through the electrical methods of measuring, scintillations or Wilson Chamber.

The book under review shows in an exceedingly beautiful way what can be done at present with photographic emulsions. In this respect it is comparable to the Atlas of Wilson Chamber pictures by Gentner, Maier Leibnitz, and Bothe.

A sequence of striking pictures of nuclear phenomena as revealed by the technique of the tracks in photographic emulsions is used to illustrate an elementary course in nuclear and cosmic-ray physics, but this arrangement and the well-written text is only, one feels, a convenient frame to illustrate the technique.

The climax is reached in plates 42–48, in which evidence is given for the new $\pi$ mesotrons recently discovered with this technique by a group of physicists, including the authors of this book.

The book contains sufficient technical information to instruct on the methods of use of the photographic plates, which are now commercially available, and, if only for this reason, it is a "must" for every research nuclear physicist.

The reproduction of the photographs and the typographical presentation are excellent—a most important feature for a book of this kind.

E. SEGRÈ

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***Techniques in experimental electronics.*** C. H. Bachman. New York: John Wiley; London: Chapman & Hall, 1948. Pp. vii + 252. (Illustrated.) $3.50.

Asked individually what they would expect to find in a book entitled *Techniques in experimental electronics,* 10 well-qualified persons, including physicists, radio engineers, electronic research engineers, and graduate students in physics, all thought that such a book would include vacuum tube circuits, discussions of electronic measurement methods, and the many other techniques familiarly known as electronic gadgeteering.

C. H. Bachman's book of the above title is, instead, a very good handbook of high-vacuum techniques and of the laboratory arts useful to those who build experimental electron tubes and related electron and ion systems.

One must consequently conclude that the title of the volume is badly chosen, despite the technical justification for the name offered in the introduction. Undoubtedly, many will purchase the book and find it of little use, while others having need of this material will pass it over.

Slightly more than half of the book is devoted to high-vacuum techniques, chapters including pumps, traps and baffles, vacuum gauges, valves and controlled leaks, demountable joints, controls and gadgets, vacuum system techniques, leak detection, and metal versus glass vacuum systems. Other chapter headings are glass-blowing fundamentals, sources of charged particles, utilization of charged particles, assembly and processing of electronic devices, and miscellaneous hints and techniques.

The treatment of high-vacuum techniques is simple and direct and filled with useful practical facts. Gauges are covered a little too sketchily for a novice in the field, and little is said of the temporary vacuum systems utilizing spherical ground joints and flexible tubing, now gaining wide acceptance.

The sections on filaments and cathodes, on electron guns and electron optics, and on ion sources are adequate