THREE TEXT-BOOKS OF PHYSICS.

(1) *A Manual of Practical Physics.* By H. E. Hadley. Pp. viii+262. (London: Macmillan and Co., Ltd., 1916.) Price 3*s*.

(2) *Text-book of Mechanics.* By Prof. Louis A. Martin, jun. Pp. xviii+313. Vol. vi: *Thermodynamics.* (London: Chapman and Hall, Ltd., 1916.) Price 7*s*. 6*d*. net.

(3) *An Intermediate Text-book of Magnetism and Electricity.* By G. F. Woodhouse. Pp. x+264. (Sedbergh: Jackson and Son, 1916.) 6*s*. net.

IT is always of interest to study text-books written by those engaged in teaching, and to note the special points which their experience as teachers leads them to emphasise.

(1) Mr. Hadley, who is principal of the School of Science at Kidderminster, is the author of a number of excellent works on physics, and the present small volume gives further proof of his ability as a clear exponent of physical principles. The book is suitable for the upper classes at schools where practical physics forms, as it should do, part of the science course. It is scarcely correct to say that it covers the work necessary for a present-day intermediate course, as many of the experiments described are qualitative rather than quantitative, and some are more suitable for the teacher to demonstrate in front of his class than for the students themselves to carry out. A noteworthy feature is the simple apparatus required for most of the work—the determination of the centre of gravity of a wickerwork basket suggests a new use for the editorial wastepaper basket!

It is open to question whether it is desirable to retain the definition of specific heat as a ratio (p. 116). In actual practice what is required most frequently is the "thermal capacity of unit mass," which is expressed in calories per gram per degree. Unless this is used the "dimensions" of an ordinary heat equation are incorrect. We may note in passing that for the same reason the value of a latent heat should be expressed, not in calories (p. 122), but in calories per gram. It has been pointed out in NATURE (vol. xcv., p. 427) that the British use of "specific" is hopelessly inconsistent, and it is only necessary to compare the definition of specific resistance on p. 225 with that of specific heat to appreciate the absurdity of our present nomenclature. A new term to denote the thermal capacity of unit mass of a substance is much to be desired.

A series of observations with an ammeter and a tangent galvanometer is followed by the remark: "This demonstrates that the current is proportional to the tangent of the angle of deflection." As the tangent galvanometer is an absolute instrument, it is obvious that no such result can be proved by its use.

(2) Prof. Martin has produced a useful text-book on thermodynamics for engineering students. It forms the sixth volume of a series by the same author. Without going into excessive detail the writer has succeeded in giving a remarkably clear outline of the essentials of the subject. Although the treatment is elementary, differential equations are used throughout, their meaning being explained in such a way as to lead the student forward step by step. A large number of numerical exercises are provided throughout the work and at the end of the book. British thermal units are alone employed. The diagrams are very good, and the typography is such as to give every assistance to the student in his study of the subject.

(3) The "Intermediate Text-book of Magnetism and Electricity," by Mr. Woodhouse, senior science master at Sedbergh School, combines practical instruction with theoretical discussion. A large number of simple experiments described in the text may be carried out by the student with no great outlay in apparatus. The author is probably right in saying that the electrolytic definition of the unit of current is more readily grasped by the average student than the electro-magnetic, but we are of opinion that greater emphasis should be laid on the distinction between the practical definitions of electrical units (the so-called international units) and the absolute definitions. The book would be much improved by a careful revision: the style is frequently curt and sometimes inelegant. Many students have been penalised in examinations for giving as the second law of electrolysis: "The weight of an element deposited is proportional to the electro-chemical equivalent." The strength of a magnetic field is not measured in dynes (p. 53), but in dynes per unit pole or gausses.

We strongly endorse the opinion of the author that all students of physics should learn the calculus. A portion of Appendix I. is devoted to explaining, briefly, the principles and method of differentiating and integrating simple quantities. Several well-known text-books of physics are marred by attempts to evade the use of the calculus. It is far better to adopt the author's plan and devote a little space and time to introducing the elements of the calculus than to employ tedious and unnecessary investigations which are only differentiation or integration in disguise. Appendix II. contains a description by Mr. J. W. Shepherd of a wireless set which, in more favourable days than the present, may be set up by the student who has obtained permission from the Postmaster-General. H. S. A.

OUR BOOKSHELF.

Le Climat de la France: Température, Pression, Vents. By G. Bigourdan. Pp. 135. (Paris: Gauthier-Villars et Cie.) Price 4 fr.

THIS publication, dealing particularly with temperature, pressure, and winds, is rather a compilation than otherwise, free use being made of the original scientific discussions by M. Angot. Temperature observations made in France go back to the middle of the seventeenth century, but, as in other countries, the early observations were made with imperfect instruments, and the exposure was often bad, the results in consequence being unsatisfactory. There are only fourteen