

position on the page. A useful list arranged by subjects gives the names of those willing to exchange publications, and there is a geographical index.

The 1935 issue of the "Index" is now available, and the 'working part', the index of personnel, runs to 443 three column pages of small but clear type. The volume should be of service to all who have occasion to deal with scientific and learned institutions. The information published, for the insertion of which no charge is made, is obtained directly from the institutions themselves, and the editor, Dr. R. de Montessus de Ballore, Sorbonne, Paris, 5, informs us that he welcomes corrections and additions to his valuable handbook. We hope this hint will catch the eye of those responsible in the U.S.S.R. for the lack of information from that country.

*Rayleigh's Principle and its Applications to Engineering: the Theory and Practice of the Energy Method for the Approximate Determination of Critical Loads and Speeds.* By Prof. G. Temple and Prof. W. G. Bickley. Pp. ix+156. (London: Oxford University Press, 1933.) 14s. net.

PROFS. TEMPLE and Bickley have exemplified and extended a principle put forward by Rayleigh so far back as 1877, a principle which, concerned primarily with the calculation of the fundamental frequencies of vibrating systems, has applications to problems of elastic stability, and to various equilibrium configurations of interest and importance to engineers. In the words of the authors, the principle may be enunciated briefly, thus: "In the fundamental mode of vibration of an elastic system, the distribution of kinetic and potential energies is such as to make the frequency a minimum".

Suppose, then, we are faced with a vibrating system the fundamental frequency of which we find it difficult, or impossible, to compute. Let us constrain the system to vibrate in a specified manner in which the mode of vibration is (mathematically) known, and approximates as closely as may be to the mode of vibration of the actual system. We can, by an application of the energy method, calculate the frequency of this artificial system; and the frequency of the actual system will, in general, be less than (in some limiting cases, equal to) this calculated frequency. The difficult task of determining the magnitude of the error has been attacked by Dr. Temple, and we are fortunate in possessing in such an easily accessible form the record of his very interesting results.

The power of the method is shown by a series of thoroughly practical illustrative examples, and the book, which is a very important addition to the literature of physics and engineering, has been written with a mind sympathetically disposed to the capacities of those weaker brethren to whom an austere mathematical argument makes but little appeal. Which is not to say that the book lacks in mathematical rigour, but merely to hint that easier paths are provided for the less mathematically minded.

A. F.

*Physique moléculaire: matière et énergie.* Par Prof. Victor Henri. Pp. 436. (Paris: Hermann et Cie, 1933.) 110 francs.

THE present time appears particularly appropriate for an attempt to form a complete picture of our knowledge concerning matter and energy. Starting from the early controversies fought around the question of continuity and discontinuity, the author describes the origin of the atomic hypothesis, the idea of chemical elements and their periodic classification, and the methods of determining Loschmidt's or Avogadro's number. This is followed by an account of the properties common to all chemical elements, a history of the atom and of its spectral manifestations. The essential features of radioactivity, radioactive elements and isotopes are set out in an easily intelligible and attractive form. Throughout the book are scattered many historical data, useful formulæ and illustrative numerical examples. Particular praise must be given to the line diagrams which are, with few exceptions, models of clearness.

*Handbuch der wissenschaftlichen und angewandten Photographie.* Herausgegeben von Alfred Hay. Band 6: *Wissenschaftliche Anwendungen der Photographie.* Teil 2: *Mikrophotographie.* Bearbeitet von T. Péterfi. Pp. ix+432. (Wien und Berlin: Julius Springer, 1933.) 51.60 gold marks.

THIS book gives a very full account of the modern state of photomicrographic technique in Germany. It constitutes, in fact, not only a textbook of the practice of the various methods, but also a fairly representative handbook on the apparatus manufactured by the various optical firms.

The trouble with a work of this kind is that its detailed character makes it difficult to read as a textbook. It can only function as a reference book, but as such it cannot fail to be of use to a serious worker. It is well printed and illustrated, and those who have occasion to use photomicrographic methods will be indebted to its author for such a useful piece of work.

*Check-List of Birds of the World.* By James Lee Peters. Vol. 2. Pp. xvii+401. (Cambridge, Mass.: Harvard University Press; London: Oxford University Press, 1934.) 17s. net.

THE appearance of the first volume of this most useful adjunct to the work of the scientific ornithologist has already been welcomed in NATURE. It is a book purely for reference, consisting of a systematic list of all known birds, with the authorities for the names used and the distribution of each form. The like has not been attempted on a world-wide basis for a generation, and as the plan and execution are admirable the completed work should be of great service. This second volume covers three great cosmopolitan orders—which incidentally include most of the birds of special interest to sportsmen—the megapodes and game-birds, the cranes, rails and bustards, and the plovers, gulls and auks.