—this forming, perhaps, the best portion of the book. After three experiments in gravimetric work the learner passes on to systematic qualitative analysis, treated from the standpoint of electrolytic dissociation. The author recognises that, "logically," the quantitative work should follow rather than precede the qualitative; but after repeated trials he prefers the order indicated. In the present connection, however, the matter is more one of convenience than of logic.

Accepting the author's system, the experiments themselves are judiciously selected, and well fitted for their purpose. But there are educationists who would by no means agree that "theoretical explanations should be reserved for the recitation-room," and not given in the laboratory. Still less would they say that the students should "study thoroughly all the details of an experiment before attempting to perform it," and that "this should be done outside the laboratory." Whether such a system would tend to produce a hodman or an architect would depend, as it seems to the writer, less upon its own merits than upon the personality of the instructor. C. S.

Die Einheit der Naturkrafte in der Thermodynamik. By Richard Wegner. Pp. viii+132. (Leipzig: Von Veit and Co., 1904.)

As described in the secondary title, this pamphlet is an attempt to deduce from the kinetic energy of non-elastic atoms, corporeal and ethereal, all known physical forces, chemical, electrical, and mechanical, including gravity. Nothing Boschovichian is assumed; only the kinetic energy of moving atoms of different sizes. It is not easy to follow an argument which provisionally assumes that the atoms are held together to form molecules with regular vibration frequencies capable of propagating through the surrounding swarm of ether-atoms waves of condensation and rarefaction, by means of the reactions and interference of which (when there are two or more molecules) attractions are brought into being; and which then, in terms of this general outlook, gives reasons why the reaction of the ether atoms may be found sufficient to hold the corporeal atoms together. A necessary consequence of the investigation is that gravity is propagated in time, and should be a function of the temperature. The author has tested the latter point by experiment, and finds some evidence in favour of its truth. The source of the chemical elements is found in the different magnitudes of the atoms, with the corresponding differences in their energetic combinations. The temperature of a body is proportional to the mean molecular weight, multiplied by the square of the mean translational velocity of the molecule; divided by the relative number of molecules in unit volume; multiplied by the relative mean path of the molecule. Since, according to the theory elaborated, the kinetic energy of the elementary particles implies attraction, all bodies will be surrounded by a layer of condensed gas and ether particles. In the waves in the ether sheath is found the source of the electrical current. Electrostatic action, on the other hand, depends on chemical actions in the ether sheath. The applications to chemical and electrical phenomena are admittedly crude and imperfectly worked out; but the author claims to have proved the possibility of deducing all the recognised forces of nature from the kinetic energy of non-elastic Lucretian atoms.

The Science and Practice of Photography. By Chapman Jones, F.I.C., &c. Fourth edition. Pp. 569. (London: Iliffe and Co., Ltd., 1904.) Price 5*s.* net.

THIS volume, which is the fourth edition of the work, has been very greatly enlarged and rewritten since the appearance of the third edition, the number of chapters having been increased from fifty-five to sixty-eight. It may be considered as forming a most excellent guide to the practice of photography, and a perfect reference for those who so continually question one as to "the best book on photography, for a beginner, you know"; and it will doubtless prove useful as a reference book to many who have long passed the beginner stage. There is a decision of tone and clearness of exposition, combined with an intelligent anticipation of the many questions which arise at every step of the path, which render it especially suitable for this purpose.

At the same time, the scientific reader who hopes to gain from it some account of the work which has been done of late years, with a view to the clearing up in some measure of the chemical and physical problems in which photography abounds, will probably be greatly disappointed. The two most noteworthy features of this, as of almost all English works on photographic science, are found in the method in which contemporary German literature is ignored, and in which the whole of modern physical chemistry is disregarded. The fact, for instance, that development may be regarded as a reversible heterogeneous reaction occurring between ionised salts, in accordance with the mass law, seems to be entirely beyond the idea of this or any other book on the subject. Development with ferrous oxalate is here represented by the equation:—

$$3AgBr + 3FeC_2O_4 = FeBr_3 + Fe_2(C_2O_4)_3 + 3Ag,$$

which, involving as it does the existence of ferric ions in the developer after use, gives a sufficiently distorted view of the reaction. While we find the chemical theory of the book to be of this type, the information as to the progress of sensitometry is of the slightest, no mention whatever being made of the notable researches by Dr. Eder. A most original suggestion as to the nature of the developable condition is to be found at the close of the chapter devoted to that subject. In brief, this book is a most delightful manual of the practice of photography, but can scarcely claim to represent the scientific side of the subject in any sense whatever. C. E. KENNETH MEES.

Ants and Some Other Insects. An Inquiry into the Psychic Powers of these Animals. With an Appendix on the Peculiarities of their Olfactory Sense. By Dr. August Forel. Translated from the German by Prof. William Morton Wheeler. Pp. 49; figures. (Chicago, 1904.) Price 2*s.* 6*d.*

AN elaborate treatise on the senses of insects, especially ants, illustrated by numerous experiments. The book deserves the most serious attention of students of psychology and animal intelligence; but it would occupy too much space, nor would any useful object be gained, by attempting to epitomise either the body of the work or even the author's deductions. We may, however, quote the following conclusions:—

"Even to-day I am compelled to uphold the seventh thesis which I established in 1877 in my habilitation as *privat-docent* in the University of Munich:

"'All the properties of the human mind may be derived from the properties of the animal mind.'

"I would merely add to this:

"And all the mental attributes of higher animals may be derived from those of lower animals. In other words, the doctrine of evolution is quite as valid in the province of psychology as it is in all the other provinces of organic life. Notwithstanding all the differences presented by animal organisms and the conditions of their existence, the psychic functions of the nerve-elements seem nevertheless everywhere to be in accord with certain fundamental laws, even in the cases where this would be least expected on account of the magnitude of the differences."