standard American procedure. We think this is wise, and, while we endorse his opinion that only the best work should be aimed at, we do not think that this means that the very elaborate American analyses should be emulated by the ordinary worker. From twenty to twenty-five elements are usually sought for by the American chemists, and nearly one-half of these may be present in less than 1 per cent. of the total rock. Such analyses look exceedingly well on paper, but require the greatest experience and manipulative dexterity if they are to be trustworthy. Moreover, their value is as yet not beyond question. Certainly an analysis in which ten or twelve elements are determined as exactly as possible is more welcome than an analysis which is more elaborate but less accurate. We notice that the author discourages the routine execution of duplicates. No doubt this is right; they take up much time, and may be useless or misleading; it is better for the experienced chemist to occupy himself in the most thorough testing of his reagents, the purity of which is never above suspicion. Still, there can be no doubt that duplicate analyses do show how far it is possible for the results to vary when two samples of the same powder are analysed. They help to check any exaggerated confidence in analytical refinements. In this respect it would be interesting to know what are the probable limits of error in analyses executed by the methods given in this book. The author gives his opinion (apparently not founded on any special investigations), and it strikes us that he is more sanguine in this respect than the majority of experienced silicate analysts in Britain or on the Continent.

OUR BOOK SHELF.

Application of some General Reactions to Investigations in Organic Chemistry. By Dr. Lassar-Cohn. Translated by J. B. Tingle, B.A. Pp. 101. (New York: Wiley and Sons; London: Chapman and Hall, Ltd., 1904.) Price 4*s.* 6*d.* net.

IT would be difficult to say with what object and for what class of readers this little volume (it is scarcely more than a pamphlet, and may be read in an hour) was written. Yet anyone engaged in the practical pursuit of organic chemistry cannot fail to be interested in it. One may say roughly that the book treats of the unsystematic part of organic chemistry, *i.e.* of the ordinary reactions which do not succeed, and how they may be made to do so.

Without always offering a very satisfactory explanation of the causes of success or failure, for the terms "protective influence" and "contact action" are after all merely names, the author points out how an apparently unimportant modification may affect the whole course of a reaction and convert an unprofitable method into a successful or commercially lucrative one. Incidentally, he urges the systematic study of these anomalous reactions.

As an example may be mentioned the well known fact that the accidental introduction of a few drops of mercury into the experimental vessel, in which the preparation of phthalic acid from naphthalene was in progress, rendered the operation and consequently the production of artificial indigo a success.

As a rule the difficulties encountered by the anomalous behaviour of organic compounds are met not by more drastic treatment, but by milder reagents. The whole trend of modern organic synthesis seems to lie in this direction. Thus the caustic alkalis have been replaced in many cases by alcoholic solutions of sodium ethoxide, by diethylamine, pyridine, or chalk, the strong mineral acids by phosphoric, boric, or one of the organic acids. High temperatures have given place to lower ones. The days of so-called "pyrogenic synthesis" are past. No one nowadays makes organic compounds by the aid of a red-hot tube.

In this connection it is suggestive that the fundamental reactions of living matter which embrace oxidation and reduction of a far-reaching kind, as well as synthetic processes more complex than anything achieved in the laboratory, are all effected at ordinary temperatures and with the mildest reagents.

It follows, therefore, that the more closely organic chemists succeed in imitating these conditions the more surely will those mysterious contact or fermentation problems usually associated with living protoplasm, but not unknown in the laboratory, approach solution. J. B. C.

A Further Course of Practical Science. By J. H. Leonard and W. H. Salmon. Pp. ix+224. (London: John Murray, 1904.) Price 2*s.*

IN this book the principles of natural science are taught and enforced in a scientific manner by means of a course of experimental work, simple in character, but involving quantitative measurements, and carried out personally by the student. To begin with, lengths are measured with an ordinary rule, and tests are made in order to find out the limits of accuracy within which the measurements may be relied on. These measurements serve as an introduction to "physical arithmetic," or simple arithmetical computations specially suitable for dealing with numbers which are avowedly only approximately correct. Then follows a chapter on elementary mensuration involving the estimation of angles, lengths, areas, and volumes, the balance very wisely sharing in this work.

Experiments are devised to illustrate some of the fundamental properties of matter, such as those of indestructibility, inertia, porosity, ductility, &c. The next six chapters deal with mechanics, the subjects including uniform linear acceleration, Newton's laws, relative motion, statical equilibrium of uniplanar forces, and simple machines. This difficult section is not treated in a very satisfactory manner. The method is too deductive, the experiments are somewhat scanty and not very well chosen. Thus there is no direct verification of the fundamental principle of the conservation of momentum. Vectors, though introduced, are not made sufficiently prominent, and in the so-called "simple machines" it seems rather antiquated to find the three kinds of levers, the three systems of pulleys, the wedge, &c., introduced.

In the concluding chapters relating to the properties of liquids and gases, and the nature of heat, the authors are happier in their treatment, notwithstanding an occasional looseness in the statement of a principle. The book deserves to be very favourably received, and teachers will find that arrangements have been made to facilitate the purchase of the apparatus necessary for conducting the experiments.

Die drahtlose Telegraphie. By Dr. Gustav Eichhorn. Pp. x+256; numerous figures. (Leipzig: Veit and Co.) Price 5 marks.

THIS is an elementary exposition of the principles and practice of wireless telegraphy with especial reference to the systems developed by Dr. Braun. It is evidently intended to enable a practical man to become acquainted with this method without, at the same time, any attempt being made to give such a complete