

a private physician double as many hours to his practice. It is now not enough to hear the patient tell what ails him—it is not enough that the fingers feel the pulse, that the eye takes cognizance of the tongue, the countenance, the secretions or the skin; it has not discharged its duty until it has looked as deeply as possible into all orifices by the aid of the many various specula, which have long been invented or daily are so; *endoscopy* has become more necessary to a complete diagnosis. The physician must, moreover, measure, thermometrise, percuss, stethoscopise, microscopise, analyse the blood and the excreted fluids. For the ancient uroscopy, which has again come into fashion, apparatus suitable for analysing urine is required. In addition to the old specula we must have a number of new ones, the rhinoscope, and especially the laryngoscope. The specialists alone seem hitherto to have had need of the ophthalmoscope, but this has acquired a more general diagnostic importance since it has been thought that signs of certain cerebral and renal diseases are discoverable in the eye. The spirometer may be dispensed with, but not a good electrical apparatus, which does double service as a diagnostic and therapeutic agent. The author enumerates some other instruments of less established utility, and adds a long list of new medicines, many of which are valuable accessions to the resources of the practitioner. We need scarcely say that his 'Therapeutic Supplements' is a most interesting and extremely useful compendium.

---

ART. V.—*A Dictionary of Chemistry.* By HENRY WATTS, B.A., F.C.S.  
Vol. I.—London, 1863. pp. 1137.

MR. WATTS'S 'Dictionary of Chemistry,' though founded on that of Dr. Ure, is essentially a new work. By far the greater part of the first volume is written either by the editor himself or by the chemists whose services have been secured for the present undertaking. In fact, if still more of the old matter had been omitted, the book would have been better. While, therefore, the majority of the scientific articles, now first published, are well planned and well executed, not a few of the mineralogical and technological notes require revision. It is not that we looked for fuller details than are given of these matters, but we expected to find the information correct, consistent, and recent, and in some instances we have been disappointed. We may cite, as an example, the following paragraph:

"BECKITE.—This name has been given to a mineral from Paynton, in Devonshire, which, according to Kenngott, is merely a coral hardened into a chalcedonic, or hornstone variety of quartz, intergrown with compact grey limestone." (p. 526.)

Now, the name of the so-called mineral here referred to is Beekite, not Beckite, while its formation is due to one of the most interesting and important actions known to chemical geologists—namely, the replacement of carbonate of calcium by silica. This change occurs in several formations, and the localities where the beekite is found are

numerous. It is occasionally seen in mammillated concretions upon limestone; but the expression "intergrown" is not appropriate to this condition of the mineral.

Other instances of this defect of the Dictionary might be easily given. Thus, on page 132, is a full description of the mineral allophane. But the occurrence of this interesting mineral in England, and the recent analyses of it, are not alluded to; in fact, the notice represents our information on the subject fourteen years ago. On page 165 it is stated: "The occidental amethysts are merely coloured crystals of quartz," the distinguishing character between amethyst and quartz—namely, the "rippled" fracture of the former—being ignored. Again, on page 192, the discovery of the formation of nitrite of ammonium by the action of ferric oxide, of chromic oxide, or of platinum on mixed ammoniacal gas and air, is not referred to. We might further justify our criticism, but will only add two more examples. Though it is commonly stated that the planes and knife-edges of the best balances are of agate (p. 482), yet corundum (sapphire) is the material really used; and "harpichord wire," mentioned on page 263 as the purest form of iron for volumetrical analysis, is not only a somewhat antiquated expression, but pianoforte wire is now made of steel, and cannot be reckoned as pure iron, often containing no more than 97 per cent. of that metal. A particular kind of iron wire is made from Bessemer's malleable iron, and is sometimes found of nearly perfect purity. One specimen of this wire contained 99.67 per cent. of iron, and therefore might be used for preparing at once a standard solution of the metal.

The typographical errors in the work under review are more numerous than they ought to be. In addition to the portentous list of errata (one hundred and ninety-six in number) given on pp. ix. to xi. of the first volume, careful reading of part of the text has shown us scores of unrecorded mistakes, such as "*tribromopropionic acid*,  $C_3H_4Br_3O_2$ ," p. 993; "*Oxide of Cinnamyl and Benzol*," p. 990, instead of Benzoyl; "*prolonged light*," p. 729, instead of polarized light; "*igniting with ether*," p. 729, instead of agitating with ether.

It may be said that the imperfections to which we have alluded are not of much importance. We readily admit that the work, taken as a whole, is of very high merit. The longer articles in it, relating for the most part to scientific chemistry, demand especial praise. The accounts given of "Acids" p. 39, "Amides" p. 169, "Ammonia" p. 182, "Analysis" p. 210, "Atomic Volume" and "Atomic Weight" p. 440, "Balances" p. 481, and "Classification" p. 1007, may be selected as characteristic specimens of the work under review. The first and last of the above-mentioned articles are by Mr. G. C. Foster, of the Andersonian Institution, Glasgow. They are remarkably clear expositions of the principles upon which chemical compounds may be systematically arranged. Here we find the views of Gerhardt on this subject followed in the main, with such developments as further researches have rendered absolutely necessary. The remarks (p. 1022) on the three bases of classification, show distinctly the philosophical

spirit in which chemists are now approaching the study of the deeper problems of their science. We extract a few words relating to this subject :

“The classification of a number of substances as containing the same radicle expresses that they are mutually convertible by comparatively simple processes—that is, that they are *genetically* related; while the classification of any set of bodies by reference to the same type, expresses that they are capable of undergoing similar transformation, and are therefore functionally related. All our strictly chemical knowledge, however, consists in a knowledge (1) of the nature and proportion of the elements of which substances are composed; (2) of their genetic relations, or of the bodies from which they can be formed, or to which they can give rise; and (3) of their chemical functions, or the transformations which they cause or undergo when they react with other bodies.” (p. 1022.)

The articles treating of ammonia and ammoniacal salts (with several other contributions) are due to the late Mr. F. T. Conington, of Oxford, who, though he may not have been a discoverer, yet possessed an unusual faculty of selecting and arranging skilfully the results obtained by chemical workers. The long article on Analysis, partly written by Mr. W. J. Russell, is most exact and trustworthy, especially so far as relates to the directions for volumetric analysis; it forms, in fact, quite a manual for use in the laboratory. The account of atomic weight and atomic volume unfolds in a most satisfactory manner the reasons for the changes in formulæ which the unitary notation demands; a few, perhaps, of the more ardent and advanced disciples of the unitary school may consider it in part out of date, but it is possible that the further alterations demanded by Cannizzaro and Wurtz are scarcely warrantable. Professor Odling, the author of the accounts, has, however, announced his intention of discussing the subject further in a subsequent volume of the Dictionary. The article on the Balance by Mr. W. S. Jevons, is well written, but it would have been rendered more interesting if a further account of the instruments used by M. Stas, in his remarkable researches on atomic weights, had been given, together with some of the results, both as regards the balance and the weights, of weighing *in vacuo*.

When this great work is complete, we trust that a supplement to it will be occasionally published, so that, like Dana's Mineralogy, it may record the progress of the science, and thus be prevented from becoming in great measure useless within a few years of its completion.

The adoption of the unitary system by the editor of this important and extensive Dictionary, is not only a proof of the growing esteem in which that system is held, but is likely to aid its progress greatly.