volume, however, as this, we have the material out of which the chemist of the future will elaborate his general theory of chemical action; and not only this, but we have a storehouse from which the student of our science may draw rich supplies of knowledge, and to which he may always refer, well assured that he will not be sent away empty.

The arrangement of the new *Handwörterbuch* is very similar to our own "Watts' Dictionary." Amid the variety and excellence of the articles, it is difficult to choose any for special mention.

The articles on Equivalents and Atoms are especially to be commended, the former by Prof. Kekulé, the latter by Prof. Fittig. In the former article the author defines the correct and true meaning of the word "equivalent"; he shows how vague oftentimes are the grounds upon which we pronounce that such a substance is equivalent to such another, and he clearly points out the great advantages possessed by the modern atomic notation as compared with the old and vague so-called equivalent notation.

In the article on Atoms we have a clear and succinct account of the modern chemical theory, and an interpretation of the way in which the older ideas of equivalency are applied to the newer atomic doctrines.

The articles on Analysis are generally full and satisfactory. It is strange, however, that such an excellent method of qualitative testing as that presented by "Bunsen's Flame Reactions" should be overlooked.

There are excellent monographs on Aniline and Benzol, by Prof. Hofmann and Zincke respectively; while on such subjects as the Respiration of Animals and Plants, and Zoö-chemistry in general, we have articles from the pen of Prof. v. Gorup-Besanez. The woodcuts are admirable; in this respect the German work is far ahead of our English Dictionary. Let us hope that the work will be completed as promised in the prospectus, and that the volume already published will not add another to the already too long list of great German scientific works the opening volumes of which stand waiting for their successors, but seemingly waiting in vain.

M. M. PATTISON MUIR

OUR BOOK SHELF

Die fossilen Bryozoen des österreichisch-ungarischen Miocäns. Von Prof. Dr. A. E. Ritter von Reuss. I. Abtheilung. Pp. 50. 4to. (Wien: 1874.)

Geologischer Bau der Insel Samothrake. Von Rudolf Hoernes. Pp. 12. 4to. (Wien: 1874)

THESE publications are extracted from the Transactions of the Imperial Academy of Sciences. Dr. v. Reuss's paper describes the Salicornaridæ, Cellularidæ, and Membraniporidæ, a number of the species being new; and gives twelve excellent plates of the fossils. According to Herr Hoernes, the island of Samothraki consists of abrupt hill-masses of ancient crystalline rocks, such as granite, clay-slate, hornblende rock, &c., overlaid, especially in the north-west and north, with deposits of Eocene age, and diluvial and recent accumulations. A coloured sketch-map accompanies the paper.

Über die palaeozoischen Gebilde Podoliens und deren Versteinerungen. Von Dr. Alois v. Alth. Erste Abtheilung. Pp. 178. (Wien: 1874.)

Über die triadischen Pelecypoden-Gattungen, "Daonella" und "Halobia." Von Dr. E. Mojsisovics v. Mojsvár. Pp. 38. (Wien: 1874.)

BOTH these publications are issued by the Austro-Hungarian Geological Survey, being extracted from the "Abhandlungen, Band vii." This mode of republishing in a separate form the papers contributed to their Transactions cannot be too strongly commended. Dr. A. v. Alth's paper relates to the region which lies between the rivers Bug and Dnieper. It is illustrated by five lithographic plates of fossils, a number of which are new species of Pteraspis, Scaphaspis, Cyathaspis, Beyrichia, &c. Dr. Mojsisovics' paper is also illustrated by five lithographic plates of a number of new species of the genera Daonella and Halobia, which are described and named by himself.

LETTERS TO THE EDITOR

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.*]

On the Inventor of Clock Movement applied to Equatorials.—Suum Quique

IN a pamphlet by Col. Laussedat, "On the Horizontal Astronomical Telescope," in which he claims for himself the invention of applying a heliostat to direct the light of any object into a fixed telescope, I find at p. 2 this statement in speaking of the equatorial: "The idea of so endowing a telescope with a moving power which annuls, or, to speak more exactly, compensates the motion of the earth, is due to a French watchmaker of the last century, named Passemont."

I am sure the distinguished writer would not knowingly have done to another the injustice of which in his own case he complains; but in fact this invention belongs to a much earlier date, and to one of far greater fame, the illustrious Robert Hooke, who describes it, with a figure, in his "Animadversions on the Machina Cœlestis of Hevelius" (my copy bears date 1674). It was primarily intended to facilitate the process of measuring directly the distance of two stars, a process which was then much in vogue, but which must have been very troublesome from the difficulty of following them. It consists of a strong polar axis, adjusted at its lower bearing by screws, and carrying at top a cross arm, one end of which bears a counterpoise, and the other a quadrant or sextant with a ball-and-socket support, by which its plane can be made to coincide with that passing through two stars. But Hooke expressly stated that a telescope may be similarly attached there. The polar axis carries an octant whose limb is ratched, and driven by a screw connected with a clock. The clock is regulated by a conical pendulum; and he describes the mode of altering its rate for the sun, moon, and planets. Of the date or details of M. Passemont's re-invention there is no trace in Lalande. But, as I find in Rees' Cyclopædia (art. "Passemont") that he was born in 1702, and that his first publication appeared in 1738, it is by at least half a century later than Hooke's.

It also deserves notice that Col. Laussedat's invention is described by Hooke in his treatise on Helioscopes two years later (1676). His words are: "I explained at the same time to the Royal Society several other ways of facilitating the use of very long glasses for other objects in the heavens (he had been speaking of the sun) by the help of one reflecting plate only, and that was by a tube fixed either perpendicularly, horizontally, or obliquely; for it mattered not, whether as to the seeing the object in any part of the heaven, and the object could be as easily found as by the common telescope of the same length. But of these elsewhere."

I have not, however, been able to find any further notice of it in his works.

This invention leads me to a suggestion which may be interesting to astronomers. The Royal Society possesses two Hüyghenian object-glasses, one of 120 feet focal length, the other of 200. Some years ago a question was raised by M. O. Struve as to the defining power of the first-named of these, in reference to a discussion on the rings of Saturn, and the Society appointed a committee to examine. It was tried at the Kew Observatory, and defined a watch-dial as well as a good 3·75-inch achromatic. This was considered sufficient without incurring the great expense of such a scaffolding or building as would have been required to use it for celestial observations. These, however, can be easily managed by Col. Laussedat's arrangement. If successful, these