

connected with the iron-industry, but also descriptions of the apparatus and manipulations especially adapted to the work.

A fuller discussion of the advantages and defects of the several methods given for the determination of a single element would have added to the user's satisfaction.

One is surprised to find in a work so excellent a table of atomic weights in which recent recalculations and redeterminations are ignored. According to this table, Al=27.5, Sb=122, Mn=55, Pt=197.18, etc. The error naturally extends to the table of factors, which are calculated on the basis of these atomic weights. Thus the factor for Al from Al_2O_3 is .53398, instead of .53010 as it would be with Clarke's value, Al=27.075 (O=16).

The mechanical execution of the book is, on the whole, superior to any thing we have had the good fortune to see in the way of laboratory handbooks. Heavy, fine paper, admirable press-work, and a party-colored binding make the book pleasant to the eye and hand, and—expensive. It is indeed almost too fine and costly to expose to the rude chance of laboratory disfigurement. It may be, however, that author and publisher hope, through its full-dress appearance, to promote a feeling of greater respect for nicety of manipulation in the chemists into whose hands it may come.

The book is unusually free from typographical errors; but we notice a slip of the proof-reader's on pp. 55, 56, 57, and 63, where the references to Fig. 45 should read H instead of D.

First Lessons in English. By F. B. GREENE. Philadelphia, Cowperthwait & Co. 16°.

ONE of the most difficult studies for most young persons is grammar. A few, whose minds are fitted to readily grasp abstract ideas, learn it easily and with pleasure; but to the majority it is at first irksome. This is partly due to the habit of English grammarians of laying down a mass of rules borrowed from the classical languages, and having but little application to our own tongue; but it is also in part due to the abstract and formal character of grammatical treatises, which are ill adapted to the minds of children. To remove this difficulty and make the introduction to grammar easier, books have been prepared of late years on the inductive principle, and teaching the rudiments of the science by example. Rules and technical terms are very sparingly used, and the pupil is taught the parts of speech and the construction of the sentence in so simple a way that he can hardly fail to understand them. The book before us is one of this class, and, though nothing but actual use in the classroom can accurately test its value, it seems to be well adapted to its purpose. It is illustrated, so as to make it attractive to very young pupils; and the lessons and examples are of the simple character that such pupils need. Such a work is certainly a great improvement on the elementary grammars of former days.

Old and New Astronomy. Parts I.-V. By RICHARD A. PROCTOR. London and New York, Longmans, Green, & Co. 4°.

THE present work, the first instalments of which have reached us, is intended to give an account of the science of astronomy and of its history to the general student. The work is admirably adapted to this purpose, Proctor's theories and arguments being set forth very clearly, and being illustrated by numerous good and very instructive cuts, which pre-eminently enhance the value of the book. In a brief introduction the author states his object. "It is as a subject for study and contemplation as a means for training and exercising, but likewise for ennobling and purifying the mind, that astronomy should be studied by all. It is the celestial science as viewed and studied by philosophers, as Newton and Herschel, that I propose to contemplate in the present volume." In the first chapter the history of the methods of observing heavenly bodies is described, in which discourse Proctor expounds his curious concept that the Egyptian pyramids were nothing else than immense observatories. The development of these methods is traced up to the present time. The next chapter contains studies of the earth's shape. The various proofs of the earth's curvature are explained by novel figures, among which we call attention to the telescopic view of a 'hull down' ship seen indistinctly beyond the sharply defined horizon, thus proving that it is farther distant than the horizon. In the discussion of the sun, moon, and planets, their apparent motions are first treated; and after an exhaustive explanation of

the ancient theories, and the paths of the planets relatively to the earth, supposed to be at rest, Kepler's system is described and explained. Of particular interest is Proctor's elementary deduction of the perturbing action of the sun on the moon, which is used in explaining the cause of the tides. The fifth instalment treats of the methods and results of measuring and weighing the solar system. The book is very beautifully printed, and the instalments are following each other very rapidly. The matter is treated very attractively, and the mathematical deductions, which are contained in notes, are so arranged as to be intelligible to anybody who has an elementary knowledge of it.

NOTES AND NEWS.

RICHARD ANTHONY PROCTOR died in this city on Sept. 12, of yellow-fever, which he had contracted in Florida. Proctor was born at Chelsea, England, on March 23, 1837. Early in life he devoted himself to astronomy, and was a very fruitful writer. His first book was on 'Saturn and its System.' In the United States he is largely known to the public through his lectures, which he delivered in most of the larger cities. His first visit to our country was in 1873-74. He was eminently successful as a popular writer, and knew well how to make the difficult problems of astronomy attractive and intelligible to the general reader. His last work, 'Old and New Astronomy,' which is being published, is a splendid specimen of his enthusiasm for his science and of his success in imparting it to his readers.

—The Appalachian Mountain Club plans an excursion to Mount Washington, Mass.; the party, which will be limited to fifty in number, to leave on Friday morning, Sept. 28.

—E. Dubois read recently, before the French Academy of Sciences, a paper on the satellites of Mars which were discovered in 1877 by Asaph Hall. It appears remarkable, that notwithstanding the numerous observations of the planet, and notwithstanding their rapid motion and close proximity to it, they were not discovered sooner. Dubois believes that such would undoubtedly have been the case if they had existed. He expresses the opinion that two of the telescopic planets which occupy the zone between Mars and Jupiter approached the former so near that they have become its satellites. He also says that several others of these bodies may become satellites of Mars in course of time.

—F. S. Mansfield, attaché to the United States Legation in Japan, visited the scene of the eruption of the Bantaisan in Japan, of which a full report was given in the last issue of *Science*. His account, which was printed in the *Atlanta Constitution*, Aug. 26, contains the following additional details: On Sunday, the 15th of July, rumblings were heard and earth-tremors felt in the vicinity of the Bantaisan. The first disturbance noticed occurred at about 7 A.M., and was followed by three earthquake shocks at intervals of ten minutes, when there occurred a loud explosion, the noise of which the people compared to the report of thousands of cannons discharged simultaneously. At 10 A.M. the eruption was at its height, and by 4 P.M. it was over. The Japanese Government has set up a temporary hospital in a schoolhouse for the treatment of the wounded, and has organized a relief committee to look after the homeless and to recover the bodies of those who had been killed. The number of people who lost their lives by the disaster was, according to the official statement from the government relief station at Inawashiro, 518, the bodies of 70 of whom had been found, while 41 persons had been injured, and were then in the hospital at Inawashiro. The eruption occurred on the eastern side of the principal peak of Bantaisan. A portion of the smaller peak was carried away. The mud then filled up the side of the mountain, not only on the eastern side, but on the northern side as well, running down in a stream to the valley below. At the foot of the mountain each stream was about half a mile wide, gradually narrowing toward the top. The main eastern stream was divided about halfway up the mountain by a ridge, and came down in two separate volumes, the one continuing east, while the other branch came down on the southern side of the mountain, the latter stopping in the very small hamlet of Minemura, which was partially destroyed by the mud covering completely some of the houses.

The amount of mud thrown out by the volcano is beyond all calculation, as all the streams reach from the top to the bottom of the mountain, a distance of four or five miles. There was no lava thrown out. The greatest number of lives lost was on the north-eastern side, on account of that side of the mountain being the location of several hot-springs resorts, and owing to the fact that the first discharge ran down on that side. At Nagasaki, a small hamlet near the volcano, a great number of lives were lost by a flood, which it appears was occasioned by the damming-up of the creek on which the hamlet is situated. The darkness which occurred at the time of the explosion extended for some ten or fifteen miles, and very small particles, like mist, fell much further.

— The sealer 'Jason,' says *Nature*, has arrived in Norway from the Greenland coast, and reports that the expedition under Dr. Fridtjof Nansen, which is to cross Greenland from east to west, left that ship on July 17 in latitude $65^{\circ} 2'$ north. An ice-belt about ten English miles in width separated the ship from the shore, but it is believed that the members would have no trouble in crossing this, the flocs being large. Dr. Nansen intended to land in the Sermilik Fiord, which is inhabited. Previous attempts at landing had failed on account of rain and fog.

— Paper relief-maps for teachers of geology and physical geography, designed by Prof. William M. Davis of Harvard College, for use in his lectures to students and teachers, are advertised by J. H. Emerton, 11 St. James Place, Boston, Mass. Being made of paper, they are much lighter and stronger than plaster relief-maps, weighing only one or two pounds each, so that they can be held in the teacher's hand, hung on the wall, or used in any position desired. They are large enough to be seen across the largest school-room, — about three feet long, a foot and a half wide, and from two to four inches high. The development of a river in a plain is shown in five maps; the development of rivers in a broken country, in three maps; a river traversing a mountain (Uintah Mountains), in two maps; the development of zigzag ridges (Appalachian Mountains), in two maps; the changes in the rivers of a country, caused by glacial drift (Canadian drainage), in two maps; river-terraces (New-England drainage), in three maps; changes in the position of divides, in three pairs of maps; and a volcano series, in six maps.

— The New York Mineralogical Club took excursions, Sept. 8, to Inwood, N.Y., and Saturday, Sept. 15 (probably the closing trip of the season), to Hoboken, N.J.

— We have received the prospectus of the Massachusetts Society for promoting Good Citizenship, and also a list of works on civil government which its committee on reading recommend. The object of the society is declared to be, "to disseminate a knowledge of the principles of good citizenship, and to promote the observance of the duties imposed thereby," and especially to encourage the study of political history and political philosophy. With this end in view, a committee has been appointed to examine the various text-books and other works on political science, and give the results of their examination to the public. The first of their reports is now before us, and is a description and criticism of works on the national and state governments of this country. The judgments of the committee are thoroughly independent, and, so far as we can judge, judicious. They evidently do not mean to recommend a worthless book; and their comments on the various works examined by them cannot fail to be useful both to teachers and to private students. Persons wishing to join the society may address the secretary, C. F. Crehore, M.D., 87 Milk Street, Boston.

— The October number of *The Chautauquan* contains 'Gossip about Greece,' by J. P. Mahaffy of Dublin University; 'Greece and Modern Civilization,' by Herbert B. Adams and William P. Trent of Johns Hopkins University; 'Solon, the Athenian,' by Thomas D. Seymour of Yale University; 'Greek Mythology,' by James Baldwin; 'The Circle of the Sciences,' by Prof. A. P. Coleman of Victoria University; 'Philanthropy,' by Prof. Richard T. Ely of Johns Hopkins University; 'The Policy of Russia in the East,' by C. K. Adams, LL.D., president of Cornell University; 'Memories of Professor Baird,' by G. Brown Goode of the National Museum; 'Yucatan,' by J. Hendrickson M'Carty, D.D.; 'Engi-

neering Feats in the West,' by Ernest Ingersoll; 'Mound-Making Ants of the Alleghanies,' by Dr. H. C. McCook; 'On a Bronze Buddha at Washington,' by Charles de Kay; and 'The Possibilities of Culture,' by Bishop H. W. Warren, LL.D. — The September *Cosmopolitan* was published this month on the 10th. Besides its principal attractions, is 'The Adventures of a Lion-Tamer,' a graphic story of Barnum's trainer of wild beasts. — Prof. Arthur T. Hadley's article in *Scribner's* for October, on 'The Railroad in its Business Relations,' will throw much light on the questions of rates, pooling, and government control. — The publishers of Worcester's dictionaries, J. B. Lippincott Company of Philadelphia, announce that they have ready an entirely new edition of their 'Academic Dictionary.' While this book is a revision of their well-known 'Academic Dictionary,' so many new features have been introduced that it was found necessary to reset the type entire. The 'New Academic' presents as a new feature the etymology of words. In orthography great attention has been paid to usage, analogy, and etymology in deciding disputable points. In pronunciation the book not only gives the preference of Dr. Worcester, but exhibits at the same time that of the leading lexicographers. The same publishing firm also announce a new edition of the 'United States Dispensary.' The revision has been thorough, and not merely the addition of a supplement. More than one-third of the book, or nearly eight hundred pages, is entirely new matter, while the whole work has been rewritten. The 'National Formulary' has been incorporated.

LETTERS TO THE EDITOR.

The Corean Potter's Wheel.

THE Corean potter's wheel consists of a circular table from two to three feet in diameter and four to six inches thick, made of heavy wood so as to aid in giving impetus to it when revolving. In general appearance it is not very unlike a modeller's table. This arrangement is sunken into a depression in the ground, and revolves easily by means of small wheels working on a track underneath, the table being pivoted in the centre. The wheel is operated directly by the foot, without the aid of a treadle of any kind. The potter sits squatting in front of the wheel, his bench or seat on a level with it, and space being left between his seat and the wheel to facilitate his movements. With his left foot underneath him, he extends his right foot, and strikes the side of the wheel with the bare sole of the foot, causing it to revolve.

P. L. JOUV.

Washington, Sept. 12.

Poison-Apparatus of the Mosquito.

MY former notes on this subject (*Science*, Aug. 26, 1887; *Proceedings of the American Association*, 1887) require amendment in the following respects: (1) the poison-fang is single, being in fact the hypopharynx, as was suspected by Dimmock; (2) the paired branches of the poison-duct run backwards into the prothorax; (3) the secreting-glands are in two paired systems, one system on each side in the prothorax. Each system consists of three trifoliate glands, the mid-gland being poisonous, and the lateral ones salivary; the three ductules uniting into the branch of the poison-duct of its own side. The other details are as before described.

G. MACLOSKIE.

Princeton College, Sept. 15.

Answers.

36. DOUBLE FRUIT. — A note in *Science* of Sept. 7 prompts me to say that in 1851 I resided on a lot in this city on which was a large number of fruit-trees, including peaches and plums of several varieties each, with cherry and apple trees. The crop of fruit was very large, and specimens of double fruit were very common on all the trees, including peaches, plums, cherries, and apples. Many of them were but slightly attached at the stem; others, two perfect specimens, attached through their whole length. In the garden double cucumbers were common. Doublets of the same kind were common in the market that season. I cannot answer as to the blossoms, having noticed nothing peculiar about them except their abundance.

JOHN J. JANNEY.

Columbus, O., Sept. 16.