

times did not exist; which is very far from securing unanimous consent among geologists.

In the same manner Mr. Hutchinson knows a great deal more about the antiquity of man than most geologists. He knows that the human species is at the most not more than 25,000 years old. Surely he has with him in that calculation the decided minority of scientific students. To most, such a period seems quite inadequate to account for known facts in human history, apart from geologic questions.

His book has ten quite pretty full-page fanciful illustrations, designed by Cecil Alden, of the *Illustrated London News*. They represent a courtship of a warrior of the bronze age, the building of Stonehenge by the dwarfs, etc. The dozen chapters into which his subject is divided take up the cave-dwellers and reindeer hunters of the stone age, the 'myth' of the great ice sheet, changes of climate, the antiquity of man, the men of the bronze age, the dwarfs and the stone monuments, as dolmens, etc.

In the line of popularizing science these chapters are moderately meritorious. The leading English works have been consulted, and especial respect is paid to such as do not oppose received and conventional opinions, or do so the least. Their writers are preferred by the author as the correct exponents of modern research. He makes considerable business out of the seeming contradictions of testimony and the disagreements of specialists, when the facts do not suit him (*e. g.*, the Spy Man and the Pithecanthropus). His reports, therefore, while apparently judicial in tone, are not really so in spirit. They are probably tinged by his avocation, as is almost inevitably the case.

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*Chemistry for Beginners.* By EDWARD HART, Ph.D. Third Edition. Revised and greatly enlarged. With 62 Illustrations and 2 plates. Easton, Pa., Chemical Publishing Company. 1896. Small square 8vo. 245 pages. Price, \$1.50.

In text-books of elementary chemistry we have one of the most prolific fields of scientific literature, and, so far from deprecating this fact, each new book is to be welcomed as a contribu-

tion toward the solution of the difficult problem how best to teach chemistry to beginners. This problem is as yet far from solution; still, comparing the text-books of to-day with those of twenty, or even ten years back, it is apparent that a distinct advance has been made. This at least may be considered settled, that a prominent place must be given to experimentation on the part of the student. What shall be the relative order of theory and description and the order of the elements in descriptive chemistry is as far as ever from a final word, nor will the latter point, in the opinion of the writer, be settled until a natural order dependent on the periodic system is reached. As regards the former point, it must be kept in mind that there are two classes of beginners—those studying in secondary schools and those of maturer minds in colleges; a method of treatment suitable for one would quite possibly not be best suited for the other.

The book before us is from the pen of an experienced teacher, and of this it gives abundant internal evidence, and while written for beginners in colleges is equally well suited for use in high schools and academies. Ostensibly a third edition, it is so completely revised and so much enlarged that it is virtually a new book. The order of treatment is as follows: Introduction on 'rusting' of metals, oxygen, hydrogen, water (with potability, purification, etc.), constitution of matter, atmosphere, compounds of nitrogen, carbon and its compounds, halogens, sulfur, silicon, boron, phosphorus, arsenic, the metals, the carbon compounds (sixty-six pages on organic chemistry).

The theoretical portion of the subject is taken up from time to time, under appropriate compounds or elements. While the elements are considered, for the most part in the usual groups, little or no regard is paid to the periodic law in their arrangement. Equations for reactions are very sparingly used, and the word valence seems not to occur at all, although graphic formulæ are used, especially in the portion on organic chemistry.

The strong feature of the book is in experimentation. Over two hundred experiments are described, and it would be difficult to find a book containing as many pertinent, well selected,

clearly described experiments, so well fitted to elucidate the text. Even experienced teachers can gain many useful points from this book. The introduction of quantitative experiments near the beginning is a great advantage, and one could wish that Prof. Hart had increased their number, were it not for the great practical difficulty of supervising a large class of novices in quantitative manipulation.

To another feature of the book attention is called in the opening paragraph of the preface: "In compiling the following pages I have tried to bear constantly in mind the fact that a large majority of those studying chemistry are not likely to become professional chemists, and have therefore taken pains to enlarge upon those topics which all educated persons should understand, such as water purification, fertilizers, the concentration of ores, the roasting of ores, assaying, the iron blast furnace, steel manufacture, etc." In these descriptions as well as in most other cases the book is up to date, and is remarkably free from portrayals of antiquated processes handed down from author to author, and so often found in modern text-books.

The book offers occasional opportunity for criticism. NO is so universally called nitric oxid or nitrogen monoxid that it is confusing to name it nitrogen dioxid; one can hardly say that 'chloric acid is *contained in* chlorates;' but points of this kind are few.

The book is attractively gotten up and the proof has been very carefully read. It should find entrance into many laboratories outside of that of its author.

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*Die Chemie im täglichen Leben.* Gemeinverständlichen Vorträge von DR. LASSAR-COHN, Universitätsprofessor zu Königsberg in Preussen. Verlag von Leopold Voss, Hamburg und Leipzig. 1896.

This book consists of twelve popular lectures on chemistry delivered by the author before the 'Verein für fortbildende Vorträge' in Königsberg. The lectures cover a wide range of topics of interest to a popular audience and are presented in a very clear and forcible manner.

Among the many subjects considered may be mentioned breathing, the weight and analysis of the air, the barometer, argon and ozone, combustion, matches, yellow and red phosphorus, the nature of flame, candles, oils and petroleum, the elements, chemical formulas, atoms and molecules, distillation, petroleum ether, paraffin and vaseline, the manufacture of illuminating gas and its by-products, the incandescent gas-burner and cooking with gas; artificial fertilizers, bones, superphosphates, potassium salts, acids, bases and salts, food-stuffs, digestion and fermentation, albumen, fats and carbohydrates, alcoholic beverages, vinegar, milk, cheese and butter, gunpowder, gun cotton, dynamite, collodion, wool, cotton and silk; leather and tanning, bleaching and dyeing, ink and paper; the manufacture of soda, potash, sulphuric acid, bleaching powder, soap, caustic soda and potash, glass and porcelain; photography in its various forms including color-photography, the metallurgy of some of the most important metals, alloys, alkaloids, chloral, ether, chloroform, antiseptics, iodoform, carbolic acid, salicylic acid, etc.

The book is illustrated with some fourteen wood-cuts, which add much to the interest in the reading matter and serve to explain much that otherwise might not be so clear to the reader.

The most recent views on the subjects considered are given, and the book is up to date in every particular, and yet the language is so simple and the explanations so clear that any person of average intelligence can readily understand them.

The book is extremely interesting and instructive and will fully repay careful reading. Even the experienced chemist will find here much information not found in the ordinary text-books.

The publication of such a series of popular lectures, which all can understand, must have a very beneficial influence on the study of chemistry and will show the uninitiated, as nothing else can, what the chemist has done and is doing. An English translation of the book by M. M. Pattison-Muir, published by J. B. Lippincott & Co., has recently appeared.

W. R. O.