not as a favor, is at best a process of doubtful value. Within a limited time it will, in my judgment, be necessary to grant retiring allowances only through institutions.

The true task of this board is not to pass upon the merits of individuals, but of colleges; to decide upon such educational standards as seem fair and wise, and then to proceed to admit to the system of retiring allowances such institutions as, complying with these standards, come within the provisions of the charter and the deed of gift. To do this involves a study of the educational situation in the United States, Canada and Newfoundland. The first step toward such a study is the bringing together of the facts themselves concerning these institutions, such as their method of government, their denominational relations, the value of each institution as a center of intellectual and moral influence, their financial resources, and, most important of all, their academic standards of work. In a word, the Carnegie Foundation for the Advancement of Teaching must be first an educational agency before it can act wisely in awarding retiring allowances. It is charged with the duty of administering a fund for higher education, for teachers in colleges, universities and technical schools of college grade. Its first concern is to ascertain how many such institutions there are and which of them are entitled on fair and reasonable conditions to the privilege of this fund.

SCIENTIFIC BOOKS

Electro-analysis. By EDGAR F. SMITH, Professor of Chemistry in the University of Pennsylvania. Fourth edition, revised and enlarged, with forty-two illustrations. Pp. 336. Philadelphia, P. Blakiston's Son and Co. 1907.

The introduction of modern electrolytic methods into chemical analysis has brought about in that science a veritable revolution, in which the author of this compendious but handy volume has been a prominent leader. It is with authority that he discusses the various electro-analytical methods of which several hundred are described in the text, for many of these methods were devised and apparently nearly all have been tested in the author's laboratory.

The book is quite frankly a collection of receipts which if followed to the letter will lead to successful analyses. When a deviation from the prescribed rule will lead to disaster, or why this method succeeds and that method fails, the reader is not told. Nor is this altogether the fault of the author. Most of the methods here given are like cook-book receipts, based on pure empiricism. We do not know why the investigator tried a given method. We only know that he tried it and it "worked." In general the practise of quantitative analysis has so far outstripped the theory that at present it may be considered more an art than a science. This state of things the author accepts without protest. A chapter entitled "Theoretical Considerations" is devoted to Freudenberg's work on the separation of metals at constant E.M.F. Aside from this no mention of theory is made except occasionally when one of the old-fashioned theories is treated as an experimental fact, for example, on page 111 it is stated as if it were well established that in the electrolysis of potassium oxalate, potassium deposits on the cathode and later reacts with the water to produce hydrogen and alkali.

The directions given in the book are as a rule clear and explicit, but not always. Thus on page 109 we read, "add 4 c.c. of a solution of ammonium acetate, 20 c.c. of citric acid, and dilute to 200 c.c. with water." It would be convenient to know the strength of the ammonium acetate and citric acid solutions which are to be added. However, such omissions are infrequent. A more serious criticism may be made which applies to every process described in the book, and it is not that the author gives too few directions, but too many to be mutually compatible. On nearly every page we are told to electrolyze

with, say, a current density of 5 amperes per 100 sq. cm. and an E.M.F. of 5.5 volts. Now when a cell is constructed of given dimensions, and filled with a solution at a certain concentration and temperature, the voltage required to produce a given current density is fixed by the conditions. It is true that the potential fall at the electrode is a very important factor in metal separations but this fall is determined directly by the current density. The voltage at the cell terminals is of no consequence in the analysis. From the directions for each process the prescribed voltage given by the author may be entirely omitted and must be in order to make the directions self-consistent.

In discussing the various processes the probable experimental error is not discussed, but fortunately figures are often given showing the results of actual analyses and from these the probable accuracy of the different methods under favorable conditions may be estimated.

Especial attention is given to the deposition of metals on a mercury cathode and to the use of rotating electrodes. The latter device, which permits an analysis formerly requiring several hours to be carried on now in a few minutes, was invented by v. Klobukow in 1886 but has only been generally adopted within the last few years. Its efficiency is apparently due merely to the relative motion of electrode and electrolyte which prevents the depletion of the electrolyte in the neighborhood of the electrode and also perhaps by mild attrition produces a more coherent film of metal. It is therefore possible to use a very high current density without the formation of loose or poorly adhesive films.

In the chapter on the history of electroanalysis it is interesting to learn that even in 1801 it was proposed to separate the metals by electrolysis, and that in 1860 Lucknow deposited the metals quantitatively and separated them from one another by means of the current, and even determined lead and manganese by depositing them as peroxides at the anode.

Besides chapters on the determination and separation of metals there are others on the determination of halogens and nitric acid, on electrolytic oxidation and on combustion of organic compounds by electrical heating. There is an index, and each chapter is introduced by a short bibliography. The volume is of a convenient size, is bound in flexible covers and is an excellent specimen of bookmaking.

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SCIENTIFIC JOURNALS AND ARTICLES

The American Museum Journal for April contains a well-illustrated article by Barnum Brown on "The Trachodon Group" of two mounted skeletons of these strange dinosaurs. There is a plate of the large African elephant head, obtained by the Tader expedition and mounted by Mr. Lang. Under "Ethnological Loan Collections" is a description of the exhibit illustrating the life of the Ojibwa Indians deposited in a branch of the public library where it is seen by children to whom the story of Hiawatha is told during the "story hour." Recent museum publications are noticed and announcements made of the various lecture courses.

The Bulletin of the Charleston Museum for March under "Museum Records" notes the progress in caring for the collections and tracing the history and records of material that has been accumulating for more than a century and includes "the fossil man of Guadeloupe," the Elliott Herbarium and specimens noted by Holbrook, and Audubon and Bachman.

The Evolution of the Elephant, by Richard S. Lull, forming Guide No. 2 of the Yale University Museum comprises 44 pages, with many illustrations and four maps of distribution of fossil and living forms. It includes a general discussion of the characters and affinities of the Proboscidea, the evolutionary sequence of the genera and species and the indicated migrations of the Proboscidea which led to their present distribution.

The Museums Journal of Great Britain for March has an article on "Museums of Elementary and Higher Grade Schools," by