4. History of libraries and library administration.

5. Paleography, classical and mediæval; diplomatics; administration of archives.

The studies in the schools of bibliography should lead up to the degree of Doctor of Philosophy as the studies in any other school. To create a special degree in 'library science,' as has been done in the library schools, seems unnecessary.

AKSEL G. S. JOSEPHSON.
THE JOHN CREERAR LIBRARY,
CHICAGO, Sept. 7, 1901.

NOTES ON INORGANIC CHEMISTRY.

IT has been often claimed that the presence of nickel in dust is a sufficient criterion to distinguish it as being cosmic rather than terrestrial in its origin. Hartley and Ramage have, however, shown in a paper recently read before the Royal Society that nickel is found in soot, and hence that nickeliferous dust may be of terrestrial origin. They also called attention to the wide distribution of gallium in small traces, being found in all aluminous minerals, in many flue dusts, in many iron ores, and in soot and atmospheric dust. A dust is described which is probably of cosmic origin. It fell on a calm night in November, 1897, was magnetic and very uniform in composition, and unlike volcanic dust or the dust of any known terrestrial source.

A CONTINUATION of Gautier's work on the rare elements in the crystalline rocks reveals not only the presence of nitrogen and argon, but also iodin and arsenic. Helium was not found. The gases of mineral waters and the gases issuing from the earth's crust into the atmosphere seemed to be formed by the action of water at high temperature upon the nitrids, argonids, carbids, sulphids, arsenids and other accessory constituents of the igneous rocks.

THE action of manganese dioxid and other finely-divided substances in facilitating the liberation of oxygen from potassium chlorate at a low temperature, is considered by some to be merely mechanical. After a series of experiments at the Explosives Committee's laboratory at the Royal Arsenal, Woolwich, Sodeau comes to the conclusion "that the supposed ability of chemically inert solid particles to facilitate the decomposition of potassium chlorate is unsupported by experimental evidence, and, if existing, is inadequate to explain even a small fraction of the great facilitation produced by the oxids of manganese, iron, cobalt, nickel, and copper. The action of the latter substances would therefore appear to be entirely chemical."

THE discovery, or rather the isolation, of a new element has been announced by M. Demarçay, in the *Comptes Rendus*. Some fifteen years ago Sir William Crookes called attention to an anomalous band in the spectrum of samarium, which he attributed to a hypothetical meta-element which he called $S\delta$. A few years later De Boisbaudran described a series of lines in the spark spectrum of samarium, and called the element which he supposed their cause $Z\zeta$. The element causing the band and the lines has now been isolated by Demarçay and named *Europium*. It has an atomic weight of about 151, and in its properties lies between gadolinium and samarium.

A NEW and interesting case of isomorphism is noted by Guthier in the *Berichte*, between one of the modifications of potassium tellurate, $K_2TeO_4,2H_2O$, and potassium osmiate $K_2OsO_4,2H_2O$. Mixed solutions of these two salts crystallize out together. This is one of the very few instances in which tellurium shows an analogy with the metals of the eighth group of the periodic system.

A PAPER has recently appeared in the *Journal de Pharmacie et de Chimie*, by E. Jungfleisch, on the 'Sulfur Industry in Sicily.' The output has increased from 150,000 tons in 1860 to 447,000 tons in 1898. The world's production at these two dates was 157,000 and 488,000 tons, Sicily thus furnishing about 90 per cent. The price during this period has not varied very largely, having been 120 francs in 1860, 142 in 1875, 100 in 1880 and 92 francs a ton in 1898. The amount of sulfur in the ore varies from a very rare richness of 75 per cent. to 20 or 25 per cent. of sulfur in the ordinary ore. A 30-per-cent. ore is considered rich, while ores are worked with as little as 10 or even 8 per cent. Poorer ores than this cannot be worked profit-

ably. The older methods of obtaining sulfur from its ore by setting fire to it in covered heaps or in kilns, where the sulfur itself served as fuel, have been discarded both on account of the waste and because of the intolerable nuisance to which the fumes of the burning sulfur gave rise. Coal is in general used as fuel, although very expensive. Extraction of the sulfur with carbon bisulfid or with a concentrated solution of calcium chlorid is in many cases used, but the only method in which no noxious fumes are generated is the extraction with steam under pressure. The extent of the industry is rapidly increasing and Sicily will long continue to supply the major part of the world's production.

The use of sulfur as a fungicide is rapidly increasing in the continental vineyards, and for this purpose it is necessary that the sulfur shall be in the most finely divided condition possible. Flowers of sulfur were at first used, and then ground and sifted refined sulfur, but a large portion of even this was wasted on account of the size of the particles. 'Blown' sulfur (*zolfo ventilato*) has lately come into extensive use. The finely ground sulfur is carried by an endless chain into a strong current of air, or for the purpose of avoiding explosions, of gases as free as possible from oxygen. The sulfur dust is carried into large settling chambers where all the larger particles are separated by their more rapid deposition. The sulfur dust thus obtained is pale yellow, resembling precipitated sulfur, and is found to be very satisfactory for fungicidal purposes.

J. L. H.

CURRENT NOTES ON PHYSIOGRAPHY.

PHYSIOGRAPHIC GEOLOGY.

THE increasing recognition of physiography as related to geology is illustrated in Brigham's excellent contribution to the Twentieth Century series ('A Text-book of Geology,' New York, Appleton, 1901, pp. 477, many illustrations). A chapter of forty pages in the middle of the book, devoted to 'Physiographic Structures,' presents a compact epitome of the subject, including a consideration of forms as the result of processes, with a brief exposition of the cycle of erosion and development of drainage. On the other hand, physiographic discipline is not likely to be gained in forty pages, as appears from the scanty treatment of so important a matter as the adjustment of drainage (284–), the explanation of which, as here given, can hardly be appreciated by those who do not already understand it. It may be questioned whether the categorical method of separating folded structures (223–) from the origin and form of folded mountains (256–) is as effective a method of presenting the real earth to beginners as would be found in a closer connection of these naturally associated facts. The same may be said of volcanic processes (135–) and volcanic topography (262–), and of glacial processes (91–) and glacial topography (266–). There may be abundant precedent for the categorical arrangement, and some justification for it in teaching; but a more natural method would bring process and form closer together.

GLACIAL LAKES IN MINNESOTA.

WINCHELL summarizes the history of twenty-six 'Glacial Lakes in Minnesota' (*Bull. Geol. Soc. Amer.*, XII., 1901, 109–128, map), whose geographical consequences are seen in gravel and silt deposits, shore lines and especially in outlet channels. The lake waters were held up by the retreating ice lobes of the Superior and Red river troughs. The most famous of them is Lake Agassiz, so fully described by Upham (Monogr. XXV., U. S. Geol. Surv.). The others were much smaller, and their outlines are at present but imperfectly traced. The outlet channels are of moderate depths, but are usually well defined by banks carved in till; the channel floors are sometimes without streams, sometimes occupied by small streams, sometimes partly covered with shallow ponds or sloughs. The fuller details of this complicated lake system will afford material for local studies for years to come.

ESKER LAKES IN INDIANA.

DRYER, who has already described the 'morainic lakes of Indiana' ('Studies in Indiana Geography,' Terre Haute, 1897, 53–60), now gives an account of 'certain peculiar eskers and esker lakes of northeastern Indiana,' (*Journ. Geol.*, IX., 1901, 123–129, 2 maps). The region concerned is traversed by a series of massive