that Professor Branner and others following him, in a discussion of the scheme of map colors adopted by the International conference of geologists, took occasion to severely criticise the scheme proposed as being too rigid, and wanting in adaptability to new regions. Among the other papers of note, we would call attention to the following: 'The geological features of a district in south-western Colorado,' by Dr. J. B. Comstock; 'The outcrop and thickness of the Tully limestone in the neighborhood of the finger lakes of western New York,' by S. G. Williams; 'The molluscan fauna of the New Jersey marls,' by R. P. Whitfield; 'A revision of the Cayuga Lake (New York) section of the Devonian,' by H. S. Williams; 'A process of mechanical deformation for the Connecticut valley triassic formation,' by W. M. Davis; 'Work in Nebraska,' by L. E. Hicks; 'Our cretaceous flora' and 'Our Devonian and carboniferous fishes,' by Professor Newberry; 'Fossil wood from Ohio,' by Professor Claypole; 'Geography and topography of the head of Chesapeake Bay,' by W. H. McGee; 'Holyoke trap range,' by B. K. Emerson; 'Some dynamic effects of the ice-sheet,' by F. J. H. Merrill.

PROCEEDINGS OF THE SECTION OF CHEMISTRY.

PROFESSOR WILEY prefaced his vice-presidential address by announcing the much-to-be-regretted death of William Ripley Nichols, his predecessor as chairman of the section.

W. H. Seaman, who, with A. C. Peale and C. H. White, forms a committee of the chemical society of Washington for the purpose of bringing about uniformity in the methods of stating water analyses, read a report upon this subject, and desired the approval of the section for the method recommended. After much debate, the matter was referred to a committee of the section, consisting of Professors Caldwell, Langeley, Myers, Mason, and Warder, who are to report another year what action is desirable.

Miss Helen C. De S. Abbott read a paper upon the proximate composition of a bark from Honduras, known as 'chichipati,' which contains a new camphor and a yellow coloring-matter, chichipatin, apparently of value as a dye and substitute for fustic. The same author also presented some considerations of the relations of the chemical constituents of plants to their morphology and evolution, believing that the chemical constituents follow parallel lines with the evolutionary course of plant forms, the one being intimately connected with the other, and the height of the scale of progression being indicated by these constituents, which are therefore appropriate for a basis of botanical classification.

H. C. Bolton, of the committee on indexing chemical literature, after presenting their report showing the large amount of valuable work which was being done, read a paper on the confusion which exists in the abbreviations employed in chemical bibliography, and the desirability of uniformity in designations of scientific periodicals.

C. F. Mabery's paper on the products of the Cowles electric furnace was of particular interest, and attracted much attention. He stated that the past year had been devoted more especially to the development of an increased commercial efficiency of the furnace, so that now three hundred horse-power could, by means of a large dynamo, be applied with greater economy in the results; and by coating the charcoal employed in the furnace with lime, by soaking it in lime-water, the production of graphite was largely avoided and a marked improvement in the working of the furnace introduced. The results — although, as compared to what would eventually be accomplished by electric smelting, they may seem crude — have reached a stage where their commercial success can be demonstrated.

It was also found that when the electrodes entered the mixture in a slanting position the product was increased. They are now also moved in and out with advantage, being gradually withdrawn as the resistance falls. Professor Mabery replied to the criticisms of Hehner of Berlin, Siemens, and others, that no new principle was involved, showing that the Cowles furnace is quite different from all hitherto constructed, and the only one of practical application by which a dynamo of three hundred horse-power could be used, as by means of a resistance-box and the arrangement of the furnace the sudden breaking of the current is prevented from burning out the dynamo. The presence of copper for the reduction of aluminium was shown to be unnecessary; and, by complete exclusion of air from the furnace, buttons of the metal were easily obtained. A product which has attracted considerable attention during the past year is obtained by reducing aluminium in presence of iron. A cast iron is formed containing sometimes as much as ten per cent of aluminium, and this product is used to facilitate the working of crude iron and to introduce into the various grades a small percentage of aluminium. In the reduction of aluminium in the presence of copper, a yellow product is frequently taken from the furnace which is composed of metallic aluminium to the extent of one-half or three-fourths, the balance being silicon and copper. It is also formed in the absence of

copper, and then contains a higher percentage of aluminium, and always contains nitrogen. It has a resinous lustre, and decomposes water at 100°.

A paper by Clifford Richardson, on some constituents of the embryo of wheat, showed the unexpected presence of a soft wax, cane-sugar to the amount of more than ten per cent, a new saccharoid, and allantoin, a nitrogenous substance of the uric acid series, together with other similar substances not yet isolated. The relations of these substances to the transfer of nitrogen in the plant were discussed.

William McNurtrie described the chemical examination of specimens of ropy milk and cream, which description, together with the discussion which ensued, showed that this unfortunate condition is brought about probably by some organism, and that cleanliness and disinfection are the best means of prevention.

The poisonous matter sometimes occurring in old cheese and ice-cream, which he has named 'tyrotoxicon,' was described by V. C. Vaughan. He showed it to be of ptomaine nature, and had been able to induce its formation in a mixture of milk, sugar, and eggs, by inoculation with a small portion of ice-cream which contains the poison. This would seem to point to its origin in the growth of some microbe. Its toxic effect is shown in the extremely rapid production of symptoms similar to those observed in cholera infantum.

Thomas Taylor presented an exposition of his views on the characteristic differences in fat crystals, which have already attracted considerable notice in print, and are well known to most of our readers.

Other papers read were as follows: 'Action of heat on ethylene,' by L. M. Norton; 'A new viscometer,' by S. M. Babcock; 'Method for the determination of the melting-point of fats,' and 'The areometric method of estimating fat in milk,' by H. W. Wiley; 'Manufacture of sodium carbonate,' by Adolf Kayser, presented by Alfred B. Young; 'Substituted acrylic and propiaric acids,' by C. F. Mabery; 'Determination of caffeine,' by Dr. Hodgson Ellis; 'Composition of soiling rye,' by William Frear; 'Preliminary analysis of leaves of Juglans nigra,' by Lillie J. Martin; 'Some laws of chemical union,' by C. F. de Laudero and Paul Prieto, read by the secretary; and 'The torsion analytical balance,' by A. S. Springer.

AN exhibition of apparatus for the destruction of parasites of cultivated plants will be held at the Horticultural school in Florence during October.

PROCEEDINGS OF THE SECTION OF PHYSICS.

THE first matter presented to the section was a recently devised instrument, by Mr. John A. Brashear, which he terms a 'gravity parallelometer. It is used in making the surfaces of a plate of plane glass truly parallel. The art of executing a single plane surface has been carried to a very high degree of perfection, but peculiar difficulties are encountered in making two surfaces parallel. By Mr. Brashear's method a variation in thickness of $\frac{1}{50000}$ of an inch can be detected. In one case, two surfaces about a quarter of an inch apart were made so nearly parallel, that, were they extended, they would not meet in five miles.

Prof. W. A. Rogers described the combined yard and metre, which will be used by the department of standards of the British board of trade in a definite determination of their relative lengths. The latest value of the metre in English measure is 39.37012 inches.

Prof. J. W. Sanborn has been for several years experimenting on the relation of dew to soil-moisture. One means of investigation has been to weigh prepared portions of soil night and morning. His conclusion is, that, except in rare cases, the idea that the soil receives moisture at night is false, and the contrary is really true. This applies where there is no vegetation.

Major H. E. Alvord presented the results of extensive temperature observations at Houghton farm relative to dew formation. Thermometers were placed so as to determine the temperature from several inches below the surface of the ground to about four feet above the surface. The results, from observations during several months in the summer of 1884, show that the minimum temperature during dew formation is about four inches above the ground, which was not unfrequently six or eight degrees lower than the temperature at the surface. The temperature at the surface was less than the temperature several inches lower. Some surprise was expressed at these results, and the dew problem was regarded as still more perplexing. The temperature of the surface on which the dew is formed is an essential factor in the solution. Discussion showed the difficulty in determining the exact temperature of the surface particles, which differs from that of the earth above or of the soil below, and the total inadequacy of the mercury thermometer as a means of determining it.

Prof. T. C. Mendenhall prefaced his paper on electric thermometry by saying that the strictures upon the mercurial thermometer should not be