ranging from Cambrian to Carboniferous, far the greater portion being Cambrian and Silurian. The rocks of Carboniferous and Devonian age are found only in two narrow belts in the ridge district and are represented by only four formations. Over the rest of the area Cambrian and Silurian strata are about equally divided. A great variety of limestones, shales and sandstones compose the Cambrian and Silurian rocks, shales and sandstones the Devonian, while only limestone appears in the Carboniferous. Great changes take place in the Silurian strata, and limestones on the northwest are represented by shales and sandstones at the southeast. The general character of the formations is graphically represented in the columnar sections, one being drawn for each of the two chief geologic districts.

In the discussion of structure, after a general statement of the broader features of Appalachian structure, the two types of deformation shown in this region are described, and instances are pointed out in the structure sections. In the ridge district the most prominent feature is the faulting, which has cut the strata up into long, narrow blocks and produced the characteristic ridge topography. Southeast of Holston River the rocks were deformed by close folds. Deformation by vertical uplift is also existent in this region, but it can be observed only in comparison with other and larger areas. In the structure sections most of the details of the different structures are shown.

Economic products of this region are marble, building stone, lead, zinc, lime, cement, clays and timber. The outcrops of the formations containing these are represented on the economic sheet as far as possible, together with the locations of mines and quarries. The principal industries are the production of zinc and marble; the timbers and water-powers are also of general importance. The various conditions which affect the development of these resources are discussed.

SCIENTIFIC JOURNALS.

AMERICAN CHEMICAL JOURNAL, JULY, 1897.

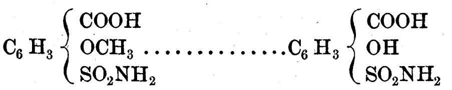
On the Decomposition of Diazo Compounds: By W. E. CHAMBERLAIN, G. F. WEIDA and W. BROMWELL. The three papers contained in this number of the journal on this general subject give the results obtained in the study of the action of methyl alcohol on certain salts of diazobenzenes and diazotoluenes. Chamberlain, following up the suggestion of Remsen and Dashiell, found that, while under ordinary atmospheric pressure the main reaction between methyl alcohol and paradiazotoluene nitrate consisted in the substitution of the methoxyl for the diazo group, yet when the reaction took place under diminished pressure the hydrogen reaction was more favored. With an increase in the pressure the product remained as under ordinary pressure. When sodium methylate is used, and when an alkaline carbonate is added to the alcohol, only the hydrogen reaction takes place. Beeson found that alkalies and zinc dust would not only cause the formation of benzene, by the decomposition of a salt of diazobenzene, but also of diphenyl. The author of this work was, however, unable to obtain any ditolyl from an analogous decomposition of diazotoluene, probably owing to some different conditions of temperature at which the reactions take place.

Weida has compared the results of the decomposition of the three nitranilines and aminobenzoic acids with methyl alcohol, with the results obtained by Remsen and Graham when ordinary alcohol was used.

In the case of the orthonitrodiazobenzene sulphate the only product was nitrobenzene; but the meta- and para-compounds gave a small amount of nitranisol beside the nitrobenzene. The salts of the diazobenzoic acid did not act as they did when treated with ordinary alcohol, but showed a tendency to give the alkoxy reaction. They all gave as the principal product the ethereal salt of the corresponding methoxy acids.

Bromwell followed the same line of research as Chamberlain, using, however, the ortho-compound where the latter had used the para. He found that the ortho-compound decomposes at a lower temperature and gives the alkoxy reaction as the other does. When orthomethoxytoluene was treated with cold concentrated sulphuric acid a monobasic sulphonic acid containing one acid residue was formed, and when it was oxidized the corresponding benzoic acid was formed. A number of the salts of the acid were prepared.

On the Action of Potassium Hydroxide on Orthomethoxysulphamine-benzoic Acid: By Chas. Walker. When the sulphonic acid described in the last paper was converted into an amide and fused with potassium hydroxide the product was not, as was expected, the corresponding dihydroxy-benzoic acid; but, as the author has shown, orthoxysulphaminebenzoic acid. The change can be represented thus:



$$C_6H_3\left\{\begin{array}{l}COOH\\OCH_3\\SO_2NH_2\end{array}\right.\ldots\ldots\ldots\ldots\ldots C_6H_3\left\{\begin{array}{l}COOH\\OH\\SO_2NH_2\end{array}\right.$$

Several salts of the acid were also made and studied.

A Simple and Efficient Boiling-Point Apparatus for Use with Low- and with High-Boiling Solvents: By H. C. Jones. The author has modified the apparatus devised by Hite by making it longer and replacing the inner tube by a platinum cylinder. By these changes he claims to have avoided the errors caused by the cold liquid returned by the condenser coming in contact with the thermometer, and also those due to radiation of heat from the bulb of the thermometer. He also replaces the outer vapor jacket, so generally used, by a cylinder of asbestos. A number of results are given which were obtained with both high and low boiling solvents.

Aluminum Alcoholates: By H. W. Hillyer. As was stated in a paper published some time ago, the authors found that when an anhydrous chloride was added to aluminum in alcohol a rapid deposition of the metal and an evolution of hydrogen took place. Dry hydrochloric acid gas or a solution in alcohol will cause a rapid evolution of gas when added to the aluminum in alcohol, and if the action is once started it will continue for some time even if no more acid is added. When the solution cools a crystalline compound, probably an addition product of the chloride and alcohol, separates out. When stannic chloride and hydrochloric acid gas are used it is very important that the materials should be completely dehydrated, as the presence of a small amount of water will stop the reaction. The results seem to show that it is necessary, in order to get a satisfactory action of aluminum on alcohol, that it should be anhydrous; that it should contain an anhydrous chloride with which it can form an addition-product; and, that the aluminum should be coupled with a more easily reducible metal.

Behavior of Chloral Hydrate with Ammonium Sulphide: By J. Lesinsky and C. Gundlich. The authors found that a mixture of chloral hydrate and ammonium sulphide will, after a longer or shorter time, depending upon the temperature, form a dark precipitate. They suggest it as a possible test for the purity of chloral hydrate and propose to study the reaction and the product.

A New and Rapid Method for the Quantitative Separation of Iron, Aluminium, Chromium, Manganese, Zinc, Nickel and Cobalt: By A. R. Cushman. This method, which is more rapid than those generally used, has been found very satisfactory; but no details can be given in a review, as it is already in the most condensed form possible. The following reviews are also given: A Resumé of Progress in the Chemistry of the Carbohydrates during 1896; Traité élémentaire de mècanique chimique fondu sur la thermodynamique, P. Duhem; Elektro-Chemische Uebungsaufgaben, F. Oettel; Theorie und Praxis der Analytischen Electrolyse der Metalle, B. Neumann; Le four électrique, H. Moissan.

J. Elliott Gilpin.

NEW BOOKS.

La structure du protoplasma et les théories sur l'hérédité et les grands problémes de la biologie générale. Yves Delage. Paris, C. Reinwald et Cie. 1895. Pp. xvi + 878. 24 fr.

Geological Survey of Canada. Annual Report, Vol. VIII., 1895. George M. Dawson. Ottawa, S. E. Dawson. 1897.

A Popular Treatise on the Physiology of Plants. Paul Sorauer. Translated by F. E. Weiss. London and New York, Longmans, Green & Co. 1895. Pp. x + 256.

Water and Public Health. James H. Fuertes. New York, John Wiley & Sons; London, Chapman & Hull, Ltd. 1897. Pp. v + 75.