

This octavo-volume contains six hundred and six pages, of which three hundred and forty-six are devoted to organic chemistry and the remainder to inorganic chemistry. Concise and correct statements regarding the more important data of the various elements and their derivatives are given. No fault can be found with the matter presented. One is impressed with the fact that the most recent chemical literature has been carefully gleaned. It is stated in the preface that when preparing this book the author had mainly in view the needs of medical and pharmaceutical students, and the impression made upon the reviewer, after careful examination of the text, inclines him to the opinion that Prof. Arnold has truly succeeded in making a valuable 'quiz compend' for a class of students who study chemistry chiefly as a side issue. The typography and binding are well executed.

S.

SCIENTIFIC JOURNALS.

AMERICAN JOURNAL OF SCIENCE.

THE June number opens with an article by M. Carey Lea, 'On the Color Relations of Atoms, Ions and Molecules.' This is the second part of an investigation, the earlier results of which were published in the *Journal* for May, 1895. In the present paper the author discusses first the interaction of ions. It is shown that if a colored substance be formed by the union of a colorless kation with a colorless anion, the color belongs to the molecule only. The colorless ions have so modified each other's vibration periods that selective absorption is exercised. As soon, therefore, as the molecule is divided into ions the color must disappear. Consequently a solvent which is capable of separating the ions gives a solution, which when dilute must be colorless, no matter how intense the color of the compound. This is illustrated by the case of the highly colored Sb_2S_3 , which forms colorless solutions because the ions, antimony and sulphur are colorless.

Furthermore, in regard to the combination of ions, it is shown that two or more similar colorless ions may unite to form colored elementary molecules; on the other hand, if colored, they

may unite to form a colorless or white molecule or polymer; or to form a molecule of a wholly different color, as when blue copper ions unite to form red copper. Still, again, two or more dissimilar colorless ions may unite to form a colored molecule, as sulphur and silver to form black silver sulphide. The use of acid indicators, for example, of litmus, is discussed, and it is shown that the change of color on contact with an alkali in no way depends upon dissociation.

The relation of the subject in general to the classification of the elements is taken up and extended beyond the point where it was carried in the earlier memoir. The failure in certain cases of Mendeléeef's periodic law is remarked upon and it is shown that the relation of ions to the visual rays leads to a classification which is in complete harmony with the chemical characteristics of the elements.

C. C. Hutchins and F. C. Robinson have a paper on the making and use of Crookes tubes to be employed in studying the phenomena connected with the Röntgen rays. The authors show that, with suitable choice of material and some skill in glass-blowing, tubes of the most favorable form may be made and exhausted in the laboratory. They have repeatedly made one, exhausted it and used it, all within an hour's time. The particular form of the tube, and the shape and distribution of the electrodes which are most favorable for producing a rapid result are discussed. It is stated that excellent impressions of the bones of the hand through thin sheet zinc have been obtained in two minutes. Incidentally some suggestions are given in regard to the best method of pumping in order to produce the high degree of exhaustion called for.

A. M. Mayer gives the results of researches on the Röntgen rays. He shows, in the first place, that they cannot be polarized by being passed through herapathite, or the iodo-sulphate of quinine, discovered by Herapath. The details of the experiments leading to these results are given, and incidentally the density of the material was found to be 1.557. In studying the transmission of the rays through certain materials the following results have been obtained, taking the amount of transmission

through aluminum of one-tenth of a millimeter and one millimeter respectively, as unity :

	$t = \frac{1}{10}^{\text{mm.}}$	$t = 1^{\text{mm.}}$
Aluminum.....	1.	1.
Glass	1.016	1.180
Green tourmaline.....	1.016	1.180
Herapathite	1.036	1.435
Platinum.....	0.000696	

Finally, it is shown that the actinic effect of the Röntgen rays varies inversely as the square of the distance of the sensitive plate from the radiant source.

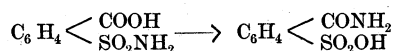
George I. Adams gives an extended memoir on the 'Extinct Felidæ of North America.' In this the literature of the subject is summarized; new points are added in regard to the family in general, with the description of certain typical species, particularly of *Hoplophonus primævus*, and finally the paper closes with a new classification intended to avoid the difficulties involved in those given hitherto. The paper is accompanied by three plates.

Arnold Hague discusses the age of the Igneous rocks of the Yellowstone National Park, the study by Knowlton of the flora found in a number of localities having made it possible to arrive at definite conclusions. The author remarks that "the facts brought together here clearly demonstrate that the pouring out of igneous rocks began with the post-Laramie uplift or closely followed, and from the time of the first appearance of these rocks volcanic eruptions continued with greater or less energy throughout Tertiary time. It is evident that from the time of the post-Laramie uplift there was, as shown in the geological history of the region, a succession of events of great importance in the development of the Rocky Mountains, and that each period of this history was characterized by distinct phases of volcanic phenomena."

The occurrence of several rare species of minerals, namely, pollucite, mangano-columbite and microlite, of Rumford, Maine, is described by H. W. Foote, with analyses and crystallographic details. A. J. Moses describes a simple method of plotting the axial cross for the crystals of any species. A. W. Pierce discusses the gravimetric determination of selenium by the use of potassium iodide.

AMERICAN CHEMICAL JOURNAL, MAY.

Transformations of Parasulphamine-benzoic Acid under the influence of heat: By IRA REMSEN and A. M. MUCHENFUSS. When parasulphamine-benzoic acid is heated to 285° a remarkable change takes place, consisting of the interchange of the amide and hydroxyl groups :



At lower temperatures other products are formed, among them being a diamide and a parasulphamine-benzoic acid different from the ordinary variety. The method of preparation and properties of these substances have been studied; but their structures are as yet unknown.

The heat of Electrolytic Dissociation of some acids. By F. L. KORTRIGHT: The author has studied the effect of difference of constitution on the heat of electrolytic dissociation and finds that certain groups produce definite thermal changes, which are however dependents on the relative position of the groups in the molecule.

On the existence of Pentaethyl Nitrogen: By A. LACHMAN. Although a number of methods were tried which it was expected would produce this substance, no evidence of its formation could be obtained.

The Conductivity of Solutions of Acetylene in water: By H. C. JONES and C. R. ALLEN. The authors show that some dissociation takes place in solutions of acetylene in water, as would be expected from its weak acid nature.

The use of Phenolphthalein in illustrating the Dissociation of Water: By H. C. JONES and C. R. ALLEN. A solution of ammonia in alcohol produces no color with phenolphthalein, as the ammonia is not dissociated by alcohol. When, however, water is added to this solution the color appears, its intensity being proportional to the amount of water added and, therefore, to the amount of dissociation caused by the water. Sodium and potassium hydroxides, however, are dissociated in alcohol and therefore produce the color in this solvent.

The action of Acid Chlorides on the Silver Salts of the Anilides: By N. L. WHEELER and B. B. BOLTWOOD. When silver formanilide is treated with benzoylchloride a diacidanilide is obtained

as the final product. In the present paper it is shown that an intermediate addition product is formed, which then breaks down into silver chloride and the diacidanilide. The reaction is similar to many studied by Nef.

On the existence of two Orthophthalic Acids: By W. T. H. HOWE. In this paper the cause of the difference in the melting point of orthophthalic acid as observed by a number of investigators is explained. The observations have been made probably with two different acids or mixtures of the two. Two have been isolated, which are alike in composition, molecular weight, and molecular refraction; but different in melting point, electrical conductivity, solubility, formation of salts with bases and reduction products. The author explains this case of isomerism by the difference in the arrangement of the double bonds of the Kekulé formula.

The Reduction of Permanganic Acid by Manganese Superoxide: By H. N. MORSE, A. J. HOPKINS and M. S. WALKER. The reduction which takes place in solutions of potassium permanganate and permanganic acid is shown to be due to the action of manganese superoxide. If the solutions, after standing a short time, are thoroughly filtered, they can be kept unchanged.

This number contains also a review of recent improvements in chemical industries, with special reference to sulphur, pyrites, sulphuric, hydrochloric and nitric acids, and reviews of Ostwald's *Klassiker*; Review of American Chemical Research, A. A. Noyes; Organic Chemistry, R. L. Whiteley; The Chemistry of Pottery, K. Langenbeck.

J. ELLIOTT GILPIN.

SOCIETIES AND ACADEMIES.

NEW YORK ACADEMY OF SCIENCES, MAY 18, 1896.

The Academy met with President Stevenson in the chair.

The Section of Geology and Mineralogy at once organized.

The first paper of the evening was by Mr. Heinrich Ries entitled 'Notes of a trip through the Marble Quarries of Western New England

and Eastern New York.' Mr. Ries sketched out the geology and geographic distribution of limestone quarries along the Hudson and Lake Champlain Valleys passing north and the marble quarries in the Green Mountains and Berkshire hills coming south. His remarks were copiously illustrated by the lantern and by many beautiful specimens. The paper was discussed by Messrs. Martin, Dodge and Kemp, to whose remarks the speaker replied.

The second paper of the evening was by J. F. Kemp on 'The great Quartz Vein at Lantern Hill, near Mystic, Conn.' The speaker described the vein as about 400 feet in width and at least 1,200 feet in length. Its northern extremity forms the summit of Lantern Hill about 500 feet above sea level. This portion is of hard milky white quartz. The southern extension of the vein forms Long Hill. It is lower in altitude and largely composed of loose pulverulent quartz, which, however, perfectly preserves the comby structure of the quartz vein. It consists of innumerable interlocking masses of quartz crystals. It is but slightly iron stained in a few spots. It is so soft that it can be crumbled between the fingers and is easily dug with pick and shovel without any blasting. The vein strikes north about 15 degrees east and cuts squarely across the laminations of the gneiss. It is one of the largest quartz veins known in the East and is of very pure silica. Samples from the crumbly portion range from 98 to 99.4 SiO₂. A few rare scales of some micaceous or chloritic mineral are practically the only other ones present. Under the microscope the powdered quartz appears quite fresh and exercises a vigorous influence on polarized light. Some prism faces of quartz crystals show etched figures, but in general the evidence of corroding alkaline solutions is hard to find. The speaker was therefore led to refer the pulverulent character of the vein to the effects of a faulting or crushing movement, although he inferred on the spot the action of some corroding alkaline solution, presumably magnesian. The paper was discussed by Messrs. Dodge and Hovey.

The third paper of the evening was by J. F. Kemp and was entitled 'The Pre-Cambrian Topography of the Adirondacks.' The speaker