could devote himself especially to the esthetic side of a paper, as in his wonderful Rector's address, "Die Organismen als historische Wesen" or in his necrologue on Anton Dohrn, he reached the state of literary perfection of a work of art. And these characteristics of his work were in full harmony with his personality. At first sight not remarkable, he immediately fascinated one through his eyes, flashing with genius. And those who knew him were aware how much the artistic side of life meant for him, who was more than an amateur in music and painting. He was not only a great scholar, but a noble, harmonious man. What he has been for our science may be said with the words that he himself dedicated to Anton Dohrn:

Er brauchte ja nur um sich zu blicken, um sich sagen zu muéssen, dass er der Biologie einen Impuls gegeben hat, dem wenige sich an die Seite stellen können, und dass seine Tat und mit ihr sein Name leuchten werden in der Geschichte unserer Wissenschaft, weit hinaus, wo nur die hoechsten Gipfel noch sichtbar sind.

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ARTHUR WILLIAMS WRIGHT

Professor Arthur Williams Wright died at his home in New Haven, Conn., on December 19. He was born on September 8, 1836, in Lebanon, Conn., where his father, Jesse Wright, at one time a member of the Connecticut House of Representatives, served as justice of the peace, selectman and a member of the school board. Samuel Wright, who settled in Springfield, Mass., in 1639, was his earliest paternal ancestor in this country. His mother was Harriet, daughter of William Williams and a descendant of Robert Williams, who came to this country from England in 1637, settling at Roxbury, Mass.

He received his early education in his native town, preparing for college, under William Kinne, at Canterbury. His career as an undergraduate at Yale College was a distinguished one. He not only achieved notable successes as a scholar in mathematics and astronomy, his studies of predilection, and in Latin, but he was prominent in undergraduate social life. A life-long love for music naturally led him to identify himself with the musical organizations of his time, and a critical knowledge of music, including an enviable skill in performance, added largely to the pleasures of his later and more leisurely life.

After graduation he continued his studies at Yale, specializing in mathematics and science, and acquired the degree of Ph.D. in 1861. From this time until his retirement in 1906 his life was identified with Yale except for a period in 1868–9, when he studied at Heidelberg and at Berlin, and the three years 1869–71 during which he held a professorship of physics and chemistry at Williams College. In the last named year he returned to Yale as professor of molecular physics and chemistry.

One of Professor Wright's most distinguished services to his university, and indeed to the teaching of science in America, was the early recognition that the practise of combining professorships of physics and of chemistry had ceased to be either economical or possible. It was, therefore, under his stimulus and activity that the first Sloane Laboratory of Yale College, the first structure in the country devoted exclusively to the work of a physical laboratory in the modern sense—was designed and constructed. This was completed in 1883, and henceforth he devoted his time, until his final retirement, to instruction and various physical investigations there, although the title of his professorship was not changed to that of molecular physics until 1887. This Sloane Laboratory also contained the study and lecture room of Professor J. Willard Gibbs, whose contributions to physical sciences have made it celebrated for all time.

The greater portion of Professor Wright's scientific work found its first publication in the *American Journal of Science*. These contributions are not merely important; they are characterized by rare excellence of form and of clarity. A short review of these papers will prove of interest.

"On a Peculiar Form of the Discharge be-

tween the Poles of the Electrical Machine," Vol. 49, 1870. This paper describes the glow produced upon the positive ball in an active electrical machine and the conditions under which it may be produced. The striking fact that each portion of this luminous surface can be regarded as due to the effect of a point area on the negative ball, as proved by sharp geometric shadows formed by minute obstacles anywhere within the region between the conductors, is quite new and it affords a particularly beautiful method of determining the shape and position of the lines of force.

"A Description of a Simple Apparatus for the Production of Ozone," Vol. 4, 1872, was followed by two studies of the chemical action of ozone. The first of these, "On the Action of Ozone upon Vulcanized Caoutchouc," Vol. 4, 1872, calls attention to the cause of the deterioration of the insulating properties of vulcanite and gives means of correcting the fault. The second paper, "On the Oxidation of Alcohol and Ether by Ozone," Vol. 7, 1874, is an application of his ozone apparatus to the chemical investigation indicated in the title.

In the same year Professor Wright published two papers on the "Zodiacal Light" and a note on his observations concerning the polarization of the light of Coggia's Comet, all of which are contained in Vol. 8. In the first of these papers the question of the polarization of the zodiacal light even to a fair determination of the ratio of polarized light to unmodified light, seems to have been definitely settled by the skilful use of a polariscope of his own design. So, also, his second paper, on the spectrum of the zodiacal light, appears to have determined once for all a discussion which had occupied many observers.

In Vols. IX. to XII., we find a series of papers, five in all, of great interest on the gaseous contents of meteoric irons and stones. In the first of these papers he reviews the known results of the investigations upon the occluded gases of meteoric irons, quoting Professor Graham and Professor J. W. Mallett. In his own investigations the material came for the most part from the collection in the possession of Yale University. His conclusions in this first paper were that no one of the several irons which he studied gave any spectroscopic evidences of unknown elements. The second paper is a brief one upon the gases derived from the meteorite of February 12 of this year, presented as a note preliminary to a farther study.

In Volume X., "Examination of Gases from the Meteorite of February 12, 1875," Professor Wright gives a thorough review of the gaseous contents of this meteor. It appears to be the first stony meteor thus investigated and the results are of great importance; they not only show the presence of gases occluded in stony meteors but that they are distinguished by having oxides of carbon as their characteristic gases, instead of hydrogen. He points out the bearing of these observations upon the peculiar spectra of comets and as a support of the meteoric theory of comets.

In Volumes XI. and XII. Professor Wright continued these important investigations, extending them to a considerable number of stony meteors of known origin. The earlier conclusion that stony meteors are characterized by a large amount of occluded carbon compounds was abundantly verified, and the last paper contains a long discussion concerning the bearing of these observations on the current theory of comets.

This terminates the series of papers on occluded gases in meteorites, but it is interesting to note that the mastery of the problems involved served him in an admirable piece of work five years later, published in Vol. XXI., 1881. The paper "On the Gaseous Substances contained in the Smoky Quartz of Branchville, Conn.," is sufficiently defined by its title, but the skill and success with which the investigation was carried out and its results presented makes the article a model worthy of careful study.

In 1877 Professor Wright published two important papers, in Vols. XIII. and XIV., respectively, on the deposition of metallic films by the cathode discharge in exhausted tubes. A clear description of the technique of the process and of the physical properties of a large number of metals thus treated makes the

papers of unusual interest. The intrinsic value of his method has proved so great that it is quite probable that the name of the author is more widely known from these scientific contributions than from any others published during his long and active life.

In the foregoing review of the scientific work of Professor Wright there has been no effort to do more than sketch the contents of the papers of chief importance, a large number of notes and minor contributions to science have been ignored. It would hardly be just, however, to fail to note his activities in X-ray experiments. At a time when Röntgen's discovery was hardly more than a rumor and the greater number of physicists, perhaps somewhat skeptically, were awaiting more definite descriptions of methods and results, Professor Wright immediately applied the test of experiment and secured the first of these photographs made in this country. This showed in a very striking way his command of all the resources of his science at the time; nor did he stop with a mere verification of the most wonderful features of the phenomena. He made many studies of the nature of the radiations and their reactions on various forms of matter, but, like other contemporary investigations, the results were hardly more than negative and he did not publish them in a permanent form.

Professor Wright was a fellow of the Royal Astronomical Society of Great Britain and of the American Association for the Advancement of Science; he was a member of the American Physical Society, of the National Academy of Sciences and of other learned societies.

C. S. H.

THE LOUTREUIL FOUNDATION

It is stated in *Nature* that the first distribution of this fund under the auspices of the Paris Academy of Sciences has been made.

The grants recommended fall into three classes:

1. To institutions specially mentioned in the will of the founder. The Natural History Museum, 1,000 francs for the continuation of researches on orchids undertaken by Professor J. Costantin, and 5,700 francs for the purchase of accumulators, and 4300 francs for a radiographic installation needed in the laboratory of Professor Jean Becquerel. The Collège de France, 4,000 francs to G. Gley, for the installation of an apparatus in his laboratory for the production of cold; 5,000 francs to L. Cayeux, for completing the equipment of his geological laboratory for petrographical researches; 2,400 francs to M. Müntz, director of the laboratory of vegetable chemistry of Meudon; 2,000 francs to L. Nattan-Larrier for the purchase of a centrifuge and incubator for cultures of microorganisms. As the provincial observatories are all attached to the universities which have already received a special legacy from M. Loutreuil, the council will only consider claims for grants relating to researches of a personal order. Under this head 3,000 francs is granted to M. Gonessiat, director of the Algiers Observatory, for the construction of an apparatus designed to measure the intensity of Hertzian waves and for a vertical seismograph. Polytechnic School, 3,000 francs to E. Carvallo, for the continuation of his researches on a method of shooting at airships. The veterinary schools of Lyons and Alfort, each 5,000 francs, for the upkeep of their libraries; the veterinary school of Toulouse, 3,000 francs for the same purpose, and 1,000 francs to M. Montane, for the reorganization of the anatomical collections of this school.

2. To institutions admitted by the president of the academy to participate in grants from the Loutreuil Fund. The Conservatoire des Arts et Metiers: 3,000 francs to Marcel Deprez, for his experiments relating to the transmission of the heat of gases to metallic walls, constantly cooled, and for experiments on electrical phenomena arising from internal-combustion motors; 4,500 francs to A. Job, for the purchase of a calorimetric bomb, an electric transformer, and other apparatus necessary to his researches on the velocities of oxidizing reactions; 6,000 francs to Jules Amar, for improving his equipment for the study of the muscular forces of man at work by the graphic and chronophotographic methods.