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**MEETING OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, NEW YORK, 1887.**

From Wednesday, August 10, until the evening of Tuesday, August 16, is the time allotted for the meeting of the association. The halls of Columbia College will have been placed at the service of the society, and the official headquarters will be at the Buckingham Hotel, on Fifth Avenue. By invitation, the various colleges, societies, and other public institutions of this city have united in organizing a strong local committee, of which President F. A. P. Barnard is chairman, Professor H. L. Fairchild secretary, and General T. L. James treasurer. Mrs. A. B. Stone is chairman of the ladies' reception committee, Professor D. S. Martin of the committee on invitations, and Professor J. S. Newberry of the committee on scientific papers. Other committees have also been provided, namely, on finance, rooms, excursions and transportation, on the mail, telegraph, and express, etc.

The following are the officers: President, S. P. Langley, of Washington; annual vice-presidents: A, mathematics and astronomy, William Ferrel, of Washington; B, physics, William A. Anthony, of Ithaca, N. Y.; C, chemistry, Albert B. Prescott, of Ann Arbor, Mich.; D, mechanical science, Eckley B. Coxe, of Drifton, Pa.; E, geology and geography, Grove K. Gilbert, of Washington, D. C.; F, biology, William G. Farlow, of Cambridge, Mass.; H, anthropology, Daniel G. Brinton, of Media, Pa.; I, eco-

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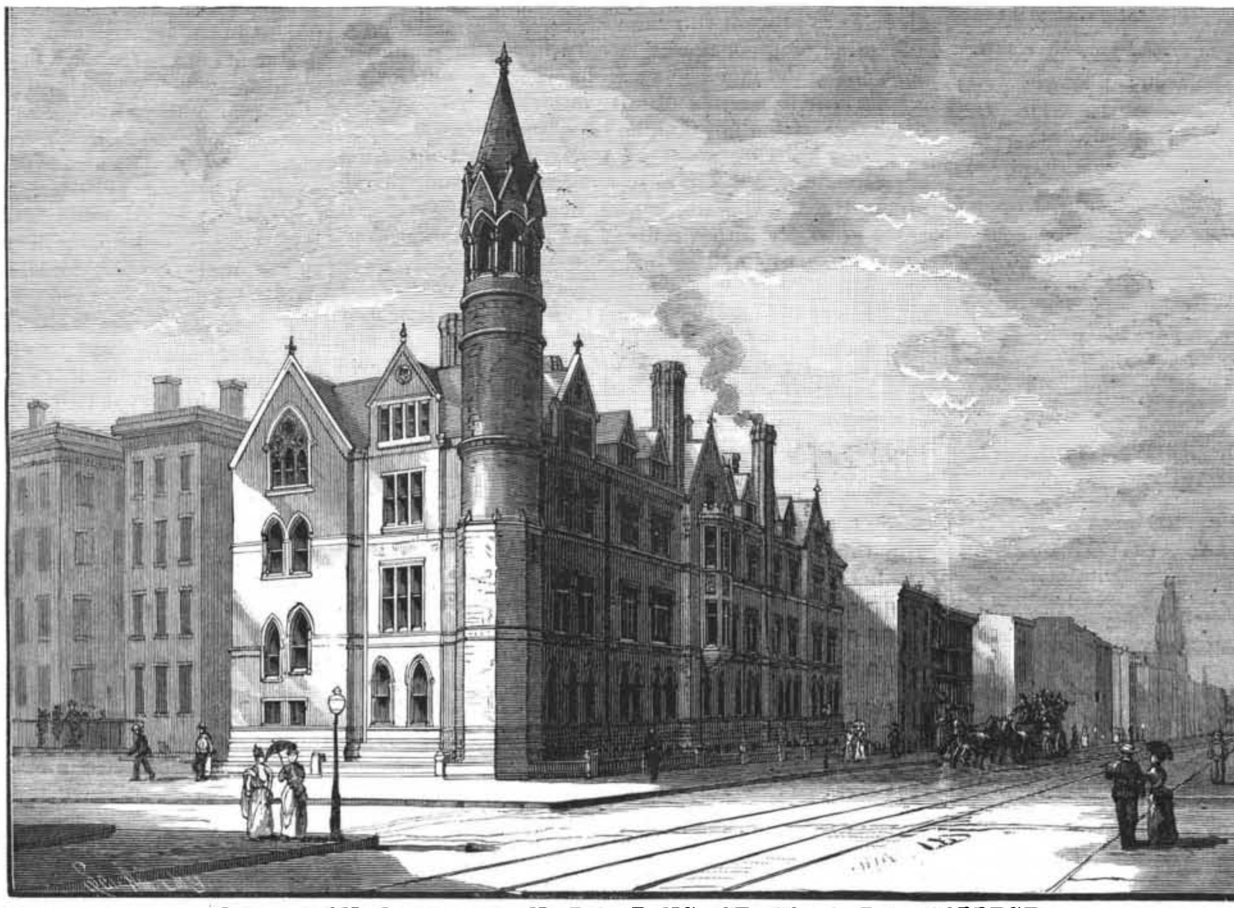

HAMILTON HALL, MAIN BUILDING OF COLUMBIA COLLEGE.

GENERAL MEETING OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE IN LIBRARY OF COLUMBIA COLLEGE, N. Y through solutions of sulphate of iron and caustic potash. It enters a washer, o, under a pressure of three atmospheres, through the tube, *t*, whose cock, *u*, is open, and here becomes cool. It then traverses a pipe filled with caustic potash and enters the tubes, *a*, described above, and therein becomes converted into supersaturated ozone. This latter flows into the first vat, C, filled with alcohol, to be rectified, traverses all the liquid that it contains, and then escapes through a pipe and traverses the vats of alcohol, C and $C_1$. At this point it has lost the greater part of its properties. On making its exit from vat, $C_2$, it is no longer supersaturated ozone that escapes from the pipe, but oxygen charged with vapors of alcohol.

This oxygen is freed from the latter in a washbottle containing cold water, is dried in contact with caustic potash, and afterward passes through a second series of apparatus like the others, first being converted into ozone, and then passing into the vats of alcohol. Finally, after meeting with a third series of apparatus, the gas, which has for a third time become oxygen, enters a gasometer, L. When the latter is full, the production of oxygen in the retorts is stopped, the cock of the tube, *t*, is closed, and that of the tube, *n*, is opened. Through a suction and force pump, the gas in the gasometer is sent through the tube, *n*, to the first washing vat, placed in front of the first series, and traverses all the apparatus again.

The operation is thus carried on until the gas is exhausted, this fact being shown by the level of the gasometer, L, which is then filled again by means of the retorts. We have, then, a closed cycle that permits of operating continuously and under economical conditions.

Fig. 1 gives a perspective view and the details of all the apparatus. The gas is supposed to be coming from the left. Between the first vat and the ozone apparatus there is a safety tube for preventing the liquid from entering the latter and breaking it in case a diminution in pressure should occur. The room containing the apparatus is kept at a temperature of less than 15°.

The alcohol treated by this process is perfectly deodorized, whatever be its source, and, on coming from the apparatus, is comparable to spirits that are several years old, thus rendering it fit for the manufacture of cognac.—*La Nature.*

## MEETING OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, NEW YORK, 1887.

(*Continued from first page.*)

nomic science and statistics, Henry E. Alvord, of Amherst, Mass.; permanent secretary, Frederick W. Putnam, of Cambridge (office, Salem, Mass.); general secretary, William H. Pettee, of Ann Arbor, Mich.; assistant general secretary, J. C. Arthur, of Geneva, N. Y.; treasurer, William Lilly, of Mauch Chunk.

The following are some points of the programme: On Wednesday morning, at 10 o'clock, a general session for organization in the library hall of the college, and in the afternoon addresses by the vice-presidents of the several sections. The retiring president, Professor E. S. Morse, will make an address in the evening. There will be daily meetings of the sections, both morning and afternoon. A general reception will be given in the Metropolitan Opera House, Thursday, at 9 P. M., by the ladies' committee, to members of the association and their families. On Friday afternoon a water party will be given by Mrs. J. S. T. Stranahan, of Brooklyn, including a visit to Governor's Island and other places of interest. In the evening of that day, the Torrey Botanical Club will give a reception. It is proposed to visit West Point on Saturday. There will be a botanical excursion, Monday afternoon, to Sandy Hook; and an evening reception by Mrs. A. B. Stone, at Valentia flats, from 5 to 7; after which the New York Academy of Sciences will welcome the A. A. A. S. at Columbia College, followed by various receptions at private residences. The closing exercises will be on Tuesday evening. An excursion to Long Branch, by ocean steamer, is arranged for the Wednesday after adjournment. Other entertainments have been suggested, viz., a visit to the benevolent institutions on Blackwell's Island; to the American Museum of Natural History; to some of the leading manufacturing establishments of the city, etc. The geological section will visit the trap rocks of Bergen Ridge and inspect the glaciation of the rocks at Central Park. The Entomological Club will meet here on the day prior to the general meeting of the A. A. A. S., and the Agricultural Society will meet Monday and Tuesday.

The fact that the association meets this year in the halls of the Columbia College gives additional interest to engravings showing the exterior of the building on Madison Avenue, "Hamilton Hall;" and the interior of the library, where the general sessions will be held.

Originally chartered, in 1754, as "King's College," this was at first distinctively an Anglican institution. George III. and other noble patrons enabled the governors of the college to "extend their plan of education almost as diffusely] as any college in Europe." The first president was Rev. Samuel Johnson, D.D., of Connecticut. For several years the recitations were heard in the vestry room of Trinity Church. The corporation of that church granted land to the institution between Broadway and the Hudson River, a portion of which was immediately, and for a hundred years, used for college buildings, while the remainder was leased, the rentals yielding a large income. During the revolutionary war the property was used as barracks for soldiers, the library was scattered, and the affairs of the college broken up. The legislature of New York, recreating the institution in 1784, perfected its charter in 1787, under the present title of "Columbia College." Thus this is its centennial year—an event enthusiastically celebrated last April, and of which this scientific assembly will be also a fitting commemoration. In 1814 the legislature granted the college a tract of twenty acres, then valued at $5,000, and located, on the present map of the city, between Fifth and Sixth Avenues and from 47th to 51st Street. It was not, however, until 1857 that the requirements of commerce made it necessary for the college to be removed from College Place to its present location, where it occupies the block bounded by 49th and 50th Streets and Fourth and Madison Avenues.

The range of academic instruction has been greatly enlarged, until now what is called the School of Arts includes, besides the usual curriculum, numerous optional studies. There are also several associated schools clustered around this as a nucleus, some of which are famous, while all are useful. These are a School of Mines, a School of Law, a School of Political Science, a School of Library Economy, and a School of Medicine. The School of Mines was established in 1864, prior to which there was no college in the country where mining was taught as a science. It grew from its original design until now it includes seven parallel courses of study, each occupying four years, and no two of which a student is allowed to pursue at once. These courses are mining engineering, civil engineering, metallurgy, geology and paleontology, analytical and applied chemistry, architecture, and sanitary engineering. Thus it might more appropriately be styled "The School of Applied Sciences." A highly interesting portion of its work is done by means of "summer classes," which meet in widely different localities. *E. g.*, in 1886, one class met in Northern Michigan, to study practical methods of mining; another for practical surveying, near Litchfield, Conn.; another for studying geodesy, near Otsego Lake; another had its headquarters at the Delamater Iron Works, on the North River; while the class in chemistry stays in the laboratories of the university. The School of Library Economy is an original feature, introduced this year, expressly to meet the wants of young persons of literary tastes wishing to study bibliography and the b st methods of selecting, buying, arranging and carin, for libraries, and making their contents useful and available for readers.

The Columbia College Library itself has been recently reorganized, and with the most modern appliances. The building in which it is contained, with its equipment, cost over $400,000; and such is the rapid accumulation of literary treasures that the trustees suggest an enlargement involving an expenditure of about a quarter of a million of dollars. The School of Law and astronomical observatory are also accommodated in this building. The building for the School of Mines was erected in 1874, at a cost of $150,000. Hamilton Hall, built in 1879, with a frontage of 200 feet on Madison Avenue, and a depth of 60 feet, shown in our engraving, was completed at a cost of about $200,000, for the School of Arts. The School of Medicine had this year 606 students, and moves this summer into its new building on 59th and 60th Streets, the munificent gift of the late Wm. H. Vanderbilt.

The chemical museum is rich in several thousand specimens to illustrate that department. The lithological cabinet contains about 5,000 rocks and minerals. The collection illustrating historical geology includes 75,000 specimens. The paleontological series includes thousands of recent and fossil animals and plants. The botanical collection has 60,000 species represented, and is peculiarly rich in "type specimens." There are also models, casts, specimens of building materials, ores, clays, coals, etc.

The faculty of this great university includes a president and one hundred and eighty professors, instructors, and assistants, and it has, according to President Barnard's statement, 1,602 students in all its departments. Such an array may well command the public attention, even amid the noise and rush of a commercial metropolis, that is by many supposed to be unfavorable to the calm pursuits of an intellectual life. The wealthy men of New York City would do wisely to increase the already large resources of Columbia College, so as to enable its managers to carry out fully and in the most attractive manner possible all their praiseworthy projects.

ELECTRICITY under favorable circumstances has been found to travel at the rate of 288,000 miles per second.

### Northern Pacific Railway.

This company has now a continuous line from St. Paul and Duluth to Tacoma, on Puget Sound, the switchback over the Cascade Mountains having just been completed. The distance from St. Paul to Tacoma is 1,937 miles, which is a saving of 124 miles over the present route by way of Portland, Ore. As the Northern Pacific owns the line from Tacoma south to Portland—145 miles—it also has its own track from St. Paul to the latter city, and the distance by this route to Portland—2,082 miles—is only 25 miles longer than the present route, using the tracks of the Oregon Railway and Navigation Co. from Wallula Junction to Portland, a distance of 222 miles. The Northern Pacific Company, therefore, has completed its long entertained hope of owning a continuous line from Lake Superior and the Mississippi to the waters of the Pacific. The great Stampede tunnel through the Cascade range, which will take the place of the switchback, is to be completed in May, 1888, and will considerably shorten the present line. Its length will be 9,880 feet, while the overhead line of switchback requires a length of about four miles to cross the mountains.

### Imitation Meteoric Iron.

It appeared to me that some interesting information might be learned by trying to reproduce meteoric iron artificially. I therefore melted together in proper proportions the iron, nickel, and other constituents of the Toluca iron. The furnace was left to go out very gradually, to insure, if possible, slow crystallization. The product is about as unlike meteoric iron as it is unlike ordinary cast metal. It is easy to see that the iron crystallized on solidification in feathery crystals, somewhat like those in some kinds of cast iron, but beyond that similarity ceases. In thus crystallizing, a harder substance was thrown off to the bounding surfaces, but it is impossible to say that it is true schreibersite. On examining the detail, the crystals constituting the chief bulk are seen to have a structure which may be called Widmanstätten figuring on a very small scale, when magnified about 60 linear looking like some etched meteoric iron unmagnified. Taking, however, all into consideration, the structure is very unlike the Toluca or any other meteoric iron which I have examined. It is, however, very interesting to find that apparently no recrystallization took place on cooling, since, unlike what is seen in cast steel, the structure on a small scale seems to be the true structure of the larger crystals. Possibly this relative permanence may depend on the difference in chemical composition. It seemed desirable to try the effect of long continued heat, but at a temperature much below the fusing point of this alloy. In making such experiments, even in well-covered crucibles, one cannot but suspect the influence of carbon introduced from the fuel, even if there is no decided proof of its action. The change produced by keeping a portion of the alloy for some hours at a high temperature was very great. I must say I expected that the effect would have been to have made the structure more like that of normal meteoric iron, but, to my surprise, I found it more unlike than before, and nearly all trace of the minute Widmanstätten figuring lost. If there is any analogy between its structure and that of any meteoric irons, it is with those which have undergone recrystallization, since the whole mass consists of interposing granular crystals of two different characters, whose size varies in relation to the original feathery crystals, the former existence of which is thus well shown, though their structure is entirely changed.

I do not think this single series of experiments sufficiently conclusive to enable us to build on them any important deductions; but, at all events, they serve to show that much might be learned by further experiment with such alloys, of equally great interest in connection with meteoric and artificial irons, since the presence of foreign constituents manifestly alters the mechanical construction very materially. It may perhaps, however, be allowable to draw one provisional conclusion. When solidifying from a state of fusion, the constituents of the complex alloy appear not to have had sufficient time to separate completely, but were able to separate when the product was kept a long time at a high temperature, crystallizing as small grains of at least two different kinds, with no special orientation. There is no evidence of such a separation in the case of meteoric irons, like that from Ruff's Mountain, the original large crystals having merely broken up into a mass of small. Though fully conscious how much more experiment is necessary, I must say that the general tendency of what is now known is to lead us to believe that the present crystalline structure of normal meteoric iron was developed at a temperature much below that of fusion, even though the material may have been previously melted. That very profound changes can quickly take place in iron, merely somewhat softened by heat, admits of no sort of doubt, and further research may prove that similar great changes may take place at no very high temperature, when the time of action is indefinitely long.—*Dr. H. C. Sorby.*