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"Meeting of the American Association for the Advancement of Science."
1859 Boston Daily Evening Traveler, 5 August, p. 1, c. 6-7.
Fisch First Supplement

REPORTED FOR THE TRAVELLER.

Meeting of the American Association for the Advancement of Science.

SPRINGFIELD, Aug. 4.

SECOND DAY--THURSDAY.

The members assembled for business shortly after 10 o'clock and after the meeting had been called to order by President Alexander, the Permanent Secretary read the names of seventeen gentlemen who were recommended by the Standing Committee for election as members of the Association.

A motion being made that they all be elected, was carried. The only Massachusetts names on the list are Messrs. R. Beal of Gill, and Simon Newcomb and Trueman H. Safford of Cambridge.

It was announced by the President that the Standing Committee advised the acceptance of an invitation from the Western Railroad and the Amherst and Belchertown Railroad to the members of the Association and the ladies accompanying them, to take a free excursion to Amherst on Saturday next, leaving Springfield at 12½ o'clock, P. M., and returning about 8 o'clock, thus enabling the party to remain two hours in Amherst to examine the Shepard Cabinet of collections in Natural History. It was also stated by the President, that the students of the College had volunteered an escort from the cars to the grounds, and that the ladies of Amherst had politely invited the company to partake of a collation on the College grounds.

After a short explanation of the arrangements by Prof. Hitchcock, it was voted to accept the invitations.

Prof. Chauvenet, from the Committee of twenty on the Coast Survey, presented their report, of which he moved to suspend the reading, and then moved that it be printed in the proceedings of the meeting. Both motions were carried.

Prof. Coffin of Annapolis moved to alter rule four of the Association in relation to printing papers presented at the meetings in the proceedings of such meetings. He desired to make it incumbent to print all papers presented either by title or in full. The motion was subsequently modified, and the subject referred to the Standing Committee, with instructions to report to-day.

There being no other general business the meeting adjourned.

SECTION A.
MATHEMATICS, PHYSICS, AND CHEMISTRY.

This section met at 10½ A. M., and proceeded immediately to elect four members for the Nominating Committee. Professors

Horsford, Peirce, Trowbridge, and J. H. C. Coffin received nominations and were elected. Prof. Gillespie, of Union College, N. Y., was appointed Chairman for the day.

Professor Bache, the Superintendent of the Coast Survey, then read a communication entitled "General account of the results of the discussion of the Declinometer Observations made at Girard College, Philadelphia, between the years 1840 and 1845, with special reference to the eleven years' period." He said that in attempting to account for these observations by theory, the first step was to separate a regular daily motion of the compass-needle from other motions which may be put under the general head of "disturbances." This was done by a mathematical process called "Peirce's criterion." A diagram of the regular movement was then made, which showed that the needle moved toward the west from $7\frac{1}{2}$ A. M. to $1\frac{1}{2}$ P. M., and then gradually moved back. The amount of this daily variation, however, slowly increases for $5\frac{1}{2}$ years, and then gradually decreases for $5\frac{1}{2}$ years, thus forming a cycle of 11 years. The discussion closed with a comparison of the results thus independently deduced, with those derived by Prof. R. Wolf, from observations of the spots upon the sun. It was shown that these follow not merely the same general law of increase and decrease with the magnetic variation, but also that any irregular movement of the one is always accompanied with a corresponding movement of the other.

At the conclusion of the communication, Profs. Pierce and Gould, in reply to inquiries from Profs. Caswell and Coffin, spoke very favorably of the mode of investigation pursued by Dr. Bache.

A paper by Commodore Charles Wilkes was then announced "On the Currents of the Ocean." Commodore Wilkes was not present, but by his desire the title was read, in order that it might be published in the proceedings of the Association.

Prof. John Broklesby of Hartford next brought to the notice of the Association "Some Observations upon Ozone, or electrified air." He said more of this substance is found in the atmosphere during the day than during the night, and more during moist weather than during dry.

The next paper by President Alexander was entitled "A Question on the Earth's Dimensions and the metre," in which the suggestion was made that a degree of longitude be measured upon the equator, in South America, and that our measures of length be taken from that.

Mr. T. H. Safford, of Cambridge, in a paper "On some points in the Mathematical Theory of Music," noticed some of those relations of numbers upon which the substitution of discords approximating to concords for concords depends. It is the existence of these relations that renders possible the "tuning" of instruments, and thus our whole present system of music. He remarked that the disposition of certain notes of the piano to change is owing to the disuse of them, as is shown by the frightful harshness of A flat in instruments used for ecclesiastical music.

Rev. Mr. Hill, of Waltham, remarked that Mr. Safford's paper explained how a good ear could detect in what key a tune was played, although not informed to what pitch the instrument was tuned. He

observed that the difficulty of making experiments upon a theory of music was owing to the fact that we are apt to hear that which, in accordance with our theory, we should hear.

Prof. Pierce said that in the new organ at Cambridge, there is a stop of very agreeable sound, and that every note of it is a discord. No theory yet brought forward will account for it.

Mr. Safford replied that pianos too perfectly tuned gave an unpleasant effect, and that the same thing is the case in the organ of the Indiana Place Chapel in Boston.

Mr. W. Watson of Cambridge, then read a paper of a very abstruse nature upon "A New Method of Investigating Plane Curves, with its application to Evolutes and Caustics." At the conclusion of the reading of this paper, the section adjourned to 4 o'clock in the afternoon.

AFTERNOON SESSION.

On re-assembling Prof. Wolcott Gibbs of the New York Free Academy, read his "Researches upon the Platinum Metals." This was an account of a new method of separating Platinum, Gold, Rhodium, etc. It received high praise from several of the chemists present.

Dr. Bache then read three papers, connectedly, "on Dr. Kane's observations at Van Renssaler Harbor."

The section then adjourned.

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SECTION B. GENERAL HISTORY AND GEOLOGY.

The first paper read before the Sectional Committee, which met immediately after the adjournment of the general meeting, was by Mr. C. H. Hitchcock of Amherst College, and was listened to by a crowded auditory.

His subject was "On the Marks of Ancient Glaciers on the Green Mountain Range in Massachusetts." He stated, in opening, that the discoveries of glacier marks in Europe had induced geologists to look after similar phenomena here, and these had been found, but he believed nothing had yet been published upon the occurrence of these marks, distinguished from the drift of the great glacier 2800 miles wide and extending to the 40th degree of north latitude from the Arctic Ocean, except a short communication to this Society and a detailed account furnished the Smithsonian Institute by Professor Hitchcock, of the ancient glaciers in Massachusetts and Vermont. Mr. Hitchcock explained in a clear manner the chief distinction between the ordinary "drift" and the marks of glaciers. To illustrate his position he drew an illustration of a valley with a glacier descending the mountain, and he showed that in this, as in almost all cases, the drift ran horizontally or at right angles, while the glacier ran North and South. He adduced other strong arguments obtained from personal researches, in favor of his theory.

Rev. J. W. Foster of Monson objected to the theory presented in the paper, differing in opinion entirely with the author.

Prof. Hagar of Proctorsville, Vt., supported the theory of Mr. Hitchcock, and spoke of the clear indications of glaciers on Mansfield Mountain in Vt., as well as in other mountains in that State.

Dr. Shurtleff of Westfield and Mr. J. P. Leslie of Pennsylvania, as also Prof. Hitchcock of Amherst, also took part in the discussion, Mr. Leslie doubting, in an able argument, the policy of accepting the conclusions arrived at by Mr. Hitchcock, while the other speakers agreed with the last named gentleman.

A paper on the Drift Cavities or "Potash Kettles of Wisconsin," was then read by Mr. Charles Whittlesay. It was well written, but our limits prevent our giving even a sketch of a paper, the reading of which occupied about a quarter of an hour.

Prof. Edward Hitchcock of Amherst then read a paper upon the frozen well at Brandon, Vt. He said it was a part of his report upon the geology of the State, but he had received permission from the Governor to present it at this meeting. The well had been examined by himself, and his assistants, A. D. Hagar and C. H. Hitchcock.

After describing the locality he said:

The well was dug in November, 1858. For about ten feet it passed through soil and gravel, then about four feet of clay. Below this lay a deposit from 12 to 15 feet thick of frozen gravel, with quite large boulders intermixed. Continuing the excavation two feet farther in the same material, water was reached. The whole depth is not far from 35 feet. The frozen part passed through appeared precisely like the same materials frozen at the surface in winter.

The well was stoned up late in the autumn, and during the winter ice formed upon the water in one night two inches thick. It continued to freeze till April, since which time no ice has formed on the surface, but when visited June 25th, the stones of the well for some four or five feet above the water were mostly loaded with ice, and the temperature of the water was only one degree above freezing. July 14th there was ice in the well. The water at that time was 22 inches deep. About 100 rods distant is another well, the temperature of which, on the 25th of June, was 51. Another well 12 feet deep, 60 rods distant, had a temperature of 45.

The subject presented two leading inquiries, said the Professor -- 1st. When and by what agency was the congelation produced so deep beneath the surface? 2d. By what means is the frost preserved from external and internal heat? In reply there were two suggestions to be made: 1st. These frozen deposits may have been produced during the glacial period that accompanied the formation of the drift.

This suggestion was dwelt upon at length, and it was contended that a frozen deposit of any past period might be indefinitely preserved. Experiments had been made which showed that even a thin layer of clay was a powerful resistant to heat. The clay on the surface at Brandon would exclude the external heat, while the gravelly strata, free from sand, would act as a tunnel to carry the ascending internal heat to the surface, and it would not, therefore, reach the frozen deposit. The arrangement at Brandon was in many respects similar to the most approved ice houses. But after all he was not sure that this was the true theory.

There was no theory.

2. We maintain that in porous depositions, especially when interstratified with those nearly impervious to air, ice may be formed in large quantities at any depth and remain unmelted for a great length of time.

This position was elaborated--showing by diagrams that when a porous mass was overlaid by clay, the heat of summer could have but little effect upon it. It had been stated, and it had not been disproved, that there were subterranean currents of air. At Owego the candle flame was deflected at the depth of 30 feet.

Upon the whole, though it is possible that the Brandon deposit is a remnant of a glacial period, he looked with more favor upon the supposition that it was the result of operations now going on, produced by currents of air through the porous deposit.

An interesting discussion followed--more to elucidate facts than to refute the theories presented.

Prof. Dawson of Montreal stated that he had met with similar phenomena in Nova Scotia, and accepted the views presented by Prof. H.

Mr. Hagar of Proctorsville, Vt., said that from the first he had considered it as owing to present causes. He had visited some abandoned iron mines in Essex, and had found ice in summer at the depth of 125 feet.

The section then adjourned for dinner.

AFTERNOON SESSION.

On the Sectional Committee coming together at four o'clock, the first paper was read by Prof. Edward Hitchcock. His subject was "On the Conglomerate near Newport, R. I., with elongated pebbles and transverse joints."

The Professor gave an interesting description of a locality about two miles from Newport, the rock of which continues several miles northward, and which is composed of mica slate, crystals of magnetic iron and granular quartz pebbles, the latter oblong and having the appearance of having received a lateral pressure. A most singular feature in this conglomerated mass is that it is cut down transversely as though with a Titan's sword. Prof. Hitchcock stated that organic remains are frequently found elongated as these, but he had never seen any so singular as these, many of the pebbles being six feet in length. He suggested that these were metamorphic rocks, and that the pebbles had been in a plastic state after their first consolidation, and to sustain this suggestion he relied principally on the joints or the cutting down mentioned above.

[Prof. Hitchcock exhibited several specimens of this conglomeration, which were examined with much interest by a large company.]

Prof. Andrews of Marietta, had examined the locality described, and supposed that the pebbles were originally sand, and were worn in this form by the action of wood of which the coal beds were formed, and under which these conglomerated masses were found.

The next paper was read by Mr. J. D. Whitney of Northampton. His subject was "On the occurrence of bones and teeth in the

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lead-bearing crevices of the Northwest." The production was very interesting, and gave much pleasure to the many ladies present. He exhibited specimens, in fine preservation, of the teeth of the mastadon, peccary, buffalo, and the jaw and teeth of the wolf, and said that others, similar to these, had been found in fifteen or twenty localities in connection with lead ore in the northwest, but in most of these the mastadon predominated.

Rev. J. W. Foster followed in a paper on the same subject, but more particularly on the geological position of the bones of the extinct peccary of the West. The subject was briefly considered, but the author expressed his conviction, that from the discoveries that had been made, the elephant was on this continent prior to the mastadon.

Mr. Whitney said he had never seen the tooth of an elephant which had been found in the lead regions, when Mr. Foster said he relied more, in forming his opinion, to those found in the peat swamps in New Jersey, which he considered of very old formation.

Professor Dawson, of Montreal, then addressed the meeting on "the Carboniferous Flora," and a more beautiful or fluent lecture is seldom heard, the only drawback to the understanding of it fully, by those of the audience not members of the Section, being the profuse use of scientific terms, yet it was evidently highly appreciated by the members themselves.

The Professor was warmly applauded on taking his seat.

It being seven o'clock, the proceedings terminated.

The levee at the residence of Hon. George Bliss was a brilliant affair, and was attended by about six hundred ladies and gentlemen, among them Gov. Morgan and wife of New York. A most delightful physical as well as intellectual feast was enjoyed by all who had the good fortune to participate.

Last evening, the beauty of Springfield put its best foot forward, and a levee, such as it has seldom been our good fortune to be invited to, was given by them to the scientific visitors and their families. The reception took place in the City Hall, and a more brilliant scene when the company assembled, much heightened by the gorgeous coloring of the interior of the hall, could scarcely be imagined. The most delicious music, an unlimited quantity of the choicest refreshments, and a profuse display of the most fragrant flowers, were only secondary to the exquisite beauty of the fairest daughters of Hampden county, the whole proving an appropriate and pleasing welcome to the men of science.

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