

raises the question as to whether condensed water vapour may not be the trap which catches the dust.

I contemplate carrying out a series of experiments to answer the following questions:—

(1) Under given conditions what difference of temperature exists between a plaster area backed up by lath, and an adjacent area not so protected?

(2) What part does the presence of water vapour in the air play in the phenomenon?

(3) Can a "reversal" of the phenomenon be produced?

THOMAS D. COPE.

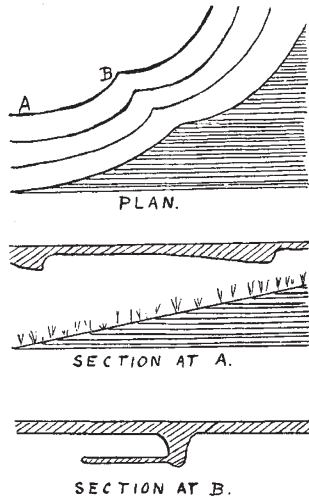
University of Pennsylvania, Philadelphia,
December 18, 1914.

Curious Forms of Ice.

ON December 30, 1914, when a heavy rainfall had been followed by a night frost, a layer of prismatic ice was seen immediately below the surface of the heaps of loose clay, in shallow workings in clay-with-flints at the south-west end of Walton Heath, Surrey. The workings are near the crest of the North Downs, at an elevation of about 600 ft. The ice varied from $\frac{1}{2}$ to $1\frac{1}{2}$ in. in thickness, and resembled the form of calcite known as "beef," but even in the most compact portions the prisms were not in close contact with one another. When observed, about midday, the ice was melting, and the sides of some of the heaps were strewn with isolated prismatic and acicular crystals of ice.

This prismatic layer of ice is similar to the ice pillars described in NATURE (vol. lxxiii., 1906, pp. 464, 485, and 534), and analogous to the masses of fibrous ice connected with lumps of chalk, recorded in NATURE (vol. lxxxviii., 1912, pp. 484 and 517).

On the same occasion, shallow pools of rain-water on Walton Heath and Headley Heath were seen to be covered with thin ice, which showed a series of concentric markings parallel to the margin. These markings were formed by ridges on the lower surface of the ice, presenting an abrupt face toward the margin and a gentle slope toward deep water. The ice in the ridges contained air bubbles. The ridges were about 4 in. apart, and in some places as many as seven in number. At points where the direction of a ridge changed, as at B in the figure, a tongue of ice projected downward and sometimes supported horizontal rods of ice half an inch below the surface.



These projections may be analogous to the "bulb formation" referred to by writers in NATURE (vol. lxxxviii., 1912, pp. 414 and 492, and vol. lxxxix., 1912, p. 34). The ridges differ in cross section and direction from those described in NATURE (vol. xc., 1912, p. 411). The pools did not show signs of loss of water by percolation. At first sight I regarded the ridges as earlier shore lines, marking successive extensions of the pools as water flowed into them, but the parallelism and equal spacing of the ridges are perhaps against this view. They may possibly be due to ripples.

G. M. DAVIES.

Birkbeck College, London, January 12.

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The Fireball of December 31, 1914.

I AM writing to tell you that I also observed the fine meteor described in NATURE of January 7 (p. 517) as having been seen at Bexley Heath on December 31 at about 11.15 p.m. I saw it from my window, facing the west, and I cannot better your description of it as "a fireball, much brighter than Venus."

Its course was from north to south, rather low down, and the sky at the time was clear above, but misty below. The meteor disappeared without leaving a luminous track behind, and seemed to dip into the mist.

I did not notice what stars it passed near, as the moon was shining; possibly there were not many just then distinctly visible.

FRANCES M. HARVEY.

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THE PHILADELPHIA MEETING OF THE AMERICAN ASSOCIATION.

THE sixty-sixth meeting of the American Association for the Advancement of Science was held at Philadelphia, Pa., on December 28, 1914—January 2, or, as it is termed, during the Convocation Week, 1914-15, under the presidency of Dr. Charles W. Eliot, President Emeritus of Harvard University. The Section on Education of the A.A.A.S. is a comparatively new one, and this was the first meeting at which a member of this section has been president of the Association.

The meetings were, almost without exception, held in the commodious buildings of the University of Pennsylvania; the only exceptions being the meetings of Section E of the Geological Society of America and the Palæontological Society of America, which were held at the Academy of Natural Sciences in the central part of the city.

At the opening session, December 28, 1914, the meeting was opened by the retiring president, Prof. E. B. Wilson, of Columbia University, who introduced president-elect Eliot. Addresses of welcome were given by Dr. E. F. Smith, Provost of the University of Pennsylvania, by Dr. W. W. Keen, President of the American Philosophical Society, by Dr. S. G. Dixon, President of the Academy of Natural Sciences, and by Mr. J. M. Dodge, representing the Franklin Institute.

Dr. Eliot replied to these addresses, and the retiring president, Dr. Wilson, then delivered his address on the subject "Some Aspects of Progress in Modern Zoology," which is printed elsewhere in this issue of NATURE.

After the adjournment of the meeting, the provost of the University and Mrs. Smith received the association and its affiliated societies in the University Museum.

The meeting was a very large one, possibly the largest in the history of the association. Registration figures indicate that there must have been more than two thousand scientific men and women in attendance. The number of affiliated societies meeting at the same time and place was also unusually large. It included the following societies:—

Society of American Bacteriologists, Entomological Society of America, American Association of Economic

Entomologists, Botanical Society of America, American Phytopathological Society, American Psychological Association, Society of American Zoologists, American Society of Naturalists, American Microscopical Society, American Physical Society, Geological Society of America, Palaeontological Society of America, American Folk-Lore Society, American Fern Society, Sullivant Moss Society, American Nature-Study Society, School Garden Association of America, American Alpine Club, American Anthropological Association, Southern Society for Philosophy and Psychology, Society for Horticultural Science, American Federation of Teachers of the Mathematical and the Natural Sciences, Society of Sigma Xi.

The meeting as a whole emphasised more than ever the importance of symposia for broad topics which bring together men of different sections. A number of these were held during the week, as follows:—

Section B and the American Physical Society, on the subject, "On the Use of Dimensional Equations."

Botanical Society of America and the American Phytopathological Society, on the subject, "Genetic Relationship of Organisms."

Section of Agriculture, "The Field of Rural Economics."

Section F, the American Society of Zoologists, and the American Society of Naturalists, "The Value of Zoology to Humanity."

Society of American Bacteriologists and Section K, on the subject of ventilation.

Sections C and K and the Society of American Bacteriologists, on the subject, "The Life of Lower Organisms in Relation to Man's Welfare."

There were two especially notable incidents of the meeting. The first of these was the first large meeting of the newly-established Committee of One Hundred on Scientific Research, of which Prof. E. C. Pickering, of the Harvard College Observatory, is chairman, and Prof. J. McKeen Cattell, of Columbia University, the secretary. Reports were received from a number of sub-committees, other sub-committees were established, and the work of the committee as a whole was systematised in order to cover the whole field of scientific research in America with the view of the ultimate ascertaining of its needs. The listing and classification of research funds, the needs of research students, the co-ordination of research among educational institutions, private endowments and industrial research, and a number of other topics will be taken up by this committee.

The second notable event of the meeting was the first session of the newly-established Section of Agriculture (Section M). This opening meeting was presided over by the president of the association, Dr. Eliot. The vice-president, Dr. L. H. Bailey, formerly Director of the College of Agriculture of Cornell University, gave his address on the subject: "The Place of Research and of Publicity in the Forthcoming Country Life Development." The symposium which followed consisted of the following addresses: "Rural Economics from the Standpoint of the Farmer," by Hon. Carl Vrooman, Assistant Secretary of Agriculture; "Credit and Agriculture," by Prof. G. N. Lauman, of Cornell University; "Market-

ing and Distribution Problems," by C. J. Brand, Chief of the Office of Markets, U.S. Department of Agriculture; and "Distinction between Efficiency in Production and Efficiency in Bargaining," by Prof. T. N. Carver, of Harvard University.

The following addresses of the presidents of sections were delivered during the week:—

(a) F. Schlesinger, "The Object of Astronomical and Mathematical Research"; (b) A. D. Cole, "Recent Evidence for the Existence of the Nucleus Atom"; (c) C. S. Alsberg, "Theories of Fermentation"; (d) O. P. Hood, "Safety Engineering"; (e) J. S. Diller, "The Relief of Our Pacific Coast"; (f) A. G. Mayer, "The Research Work of the Tortugas Laboratory of the Carnegie Institution at Washington"; (g) H. C. Cowles, "The Economic Trend of Botany"; (h) W. B. Pillsbury, "The Function and Test of Definition and Method in Psychology"; (i) J. G. Wall, "Social and Economic Value of Technological Museums"; (k) T. Hough, "The Classification of Nervous Reactions"; (l) P. P. Claxton, "The American Rural School"; (m) L. H. Bailey, "A Place of Research and of Publicity in the Forthcoming Country Life Development."

Following the example of the British Association for the Advancement of Science, two public evening lectures complimentary to the citizens of Philadelphia and vicinity were given. Dr. D. C. Miller, of the Case School of Applied Science, lectured on Tuesday evening, December 29, on "The Science of Musical Sounds," illustrating his lecture by a large number of striking experiments. The second was given on Wednesday evening by Dr. W. H. Nichols, of the General Chemical Company, on "The War and Chemical Industry." These lectures were rather largely attended, but the American Association has not as yet succeeded in making these lectures as important, viewed as social functions, as has the British Association.

No strikingly important matters of business were considered by the council. A few small research grants were made, and the assistance of the association was continued to the Concilium Bibliographicum Zoologicum of Zurich. It was decided to hold a summer meeting in 1915 at San Francisco under the auspices and management of the Pacific Coast Division of the American Association, the dates to be August 2 to 7. For the place of the next Convocation Week meeting (December 27, 1915, to January 1, 1916), Columbus, Ohio, was chosen. It will be remembered that the association had virtually accepted an invitation from the University and City of Toronto, Canada, for this last-named meeting, but on account of conditions arising from the war, Toronto begged to be allowed to postpone this meeting to some future and more favourable date.

At the close of the meeting the following officers were elected for the coming year:—

President: Prof. W. W. Campbell, Lick Observatory, University of California.

Presidents of Sections: A, *Mathematics and Astronomy*, Prof. A. O. Leuschner, University of California; B, *Physics*, Prof. Frederick Slate, University of California; C, *Chemistry*, Prof. W. McPherson, Ohio State University; D, *Engineering*, Mr. Bion J. Arnold, of Chicago; E, *Geology and Geography*, Prof.

C. S. Prosser, Ohio State University; F, *Zoology*, Prof. V. L. Kellogg, Stanford University; G, *Botany*, Prof. W. A. Setchell, University of California; H, *Anthropology and Psychology*, Prof. G. M. Stratton, University of California; I, *Social and Economic Science*, Dr. Geo. F. Kunz, of New York; K, *Physiology and Experimental Medicine*, Prof. F. P. Gay, University of California; L, *Education*, Prof. E. P. Cubberley, Stanford University; M, *Agriculture*, Prof. Eugene Davenport, University of Illinois.

Permanent Secretary: Dr. L. O. Howard, Smithsonian Institution, re-elected for a five-year period from August 20, 1915.

General Secretary: Dr. Henry Skinner, Academy of Natural Sciences, Philadelphia, Pa.

Secretary of the Council: Prof. W. E. Henderson, Ohio State University.

Secretaries of the Sections: A, Forest R. Moulton, University of Chicago, Chicago, Ill.; B, W. J. Humphreys, U.S. Weather Bureau, Washington, D.C.; C, J. Johnston Geophysical Laboratory, Carnegie Institution of Washington, Washington, D.C.; D, A. H. Blanchard, Columbia University, New York; E, G. F. Kay, State University of Iowa, Iowa City, Iowa; F, H. V. Neal, Tufts College, Mass; G, W. J. V. Osterhout, Harvard University, Cambridge, Mass.; H, G. G. MacCurdy, Yale University, New Haven, Conn.; I, S. C. Loomis, 69 Church Street, New Haven Conn.; K, C. E. A. Winslow; L, S. A. Curtis, Liggett School, Detroit, Mich.; M, E. W. Allen, Office of Experiment Stations U.S. Department of Agriculture, Washington, D.C.

Treasurer: R. S. Woodward, Carnegie Institution of Washington, Washington, D.C.

Assistant Secretary: F. S. Hazard, Office of the A.A.A.S., Smithsonian Institution, Washington, D.C.

THE EARTHQUAKE IN CENTRAL ITALY.

THE earthquake of January 13 was by no means one of the first order of magnitude, but it was the most destructive of which we possess any record. In Avezzano, which formerly contained 11,000 inhabitants, the death-rate amounts to 90 per cent., while it rises still higher in some of the adjoining villages, in Cese to 94 per cent., and in Lapelle to 97 per cent. Before this, the highest known death-rate was 81 per cent. at Avendita during the Norcian earthquake of 1703. There can be little doubt that the disastrous character of this earthquake was as usual due to the faulty construction of the houses, which consisted of stones with little or no binding of cement. Partly, also, it was due to the comparative immunity of the central district from great earthquakes in the past, which has allowed such buildings to survive.

Few details of scientific value have as yet reached this country. The earthquake occurred at 7.53 a.m. (or 6.53, Greenwich mean time). At Rome, it lasted from 15 to 20 seconds. Near the epicentre, there was one shock of great violence, followed by three others. In other neighbouring places, two prolonged shocks were felt. The principal epicentre was no doubt close to Avezzano, probably within five miles of that town. It was in this district that the high death-rates occurred. There was apparently, however, a secondary epicentre including Sora, where 500 persons lost their lives, and Isola Liri; and it is

possible that the double shock noticed at some places was due to impulses in two corresponding foci, about twenty or twenty-five miles apart. The area of perceptible damage to buildings extends almost across the peninsula, from Rome on the west to Chieti on the east, these places being 110 miles apart. Towards the north, the shock was felt at Ancona, Perugia, and Grosseto, and, towards the south, at Naples and Potenza; that is, over an area roughly 300 miles long, 240 miles wide, and containing about 56,000 square miles. The shock was recorded at many distant observatories, including those in this country and at Washington. The after-shocks must have been very numerous in the epicentral area. More than 120 were registered at Rome during the first two days, all of them slight, with the exception of one at 8.14 a.m. on January 14.

Earthquakes are neither frequent nor severe in the district chiefly affected. Dr. Baratta, in his "I terremoti d'Italia," defines in it two distinct seismic zones, one including Sora and Isola Liri, the other, less important in the past, extending from Avezzano to Anticoli. To the former zone belong the strong earthquakes of August 19, 1777, and May 9, 1891; and, to the latter, the earthquake of April 10, 1885. The recent shock must have been far stronger than any of these earthquakes, and, as pointed out above, it seems to have consisted of almost simultaneous impulses in both the Avezzano and Sora centres.

C. DAVISON.

VICE-ADMIRAL SIR GEORGE NARES, K.C.B., F.R.S.

BORN at Aberdeen in 1831, G. S. Nares entered the Navy on board H.M.S. *Canopus*, an old battleship captured from the French, in 1845, and was transferred to the *Havannah*, a frigate for service in the Pacific, in 1847. He passed his examination for lieutenant in 1851, and, coming home shortly afterwards, was appointed to the *Resolute*, and sent to the Arctic in the expedition under Captain Sir E. Belcher in search of the Franklin Expedition. His service up to the time he was a lieutenant was entirely in sailing vessels, the motive power of which was the wind applied to the propulsion of vessels by masts, yards, and sails, and this early training made him a thorough master of managing vessels in all circumstances of wind and weather, and although during his service after returning from the Arctic in 1854 he was employed in vessels that were furnished with auxiliary steam power, he was always pleased when he could navigate his vessel under sail alone. One instance of this may be given. When at Malta in the *Newport* in 1869 the chief engineer of that vessel, who was anxious not to go to sea on the day named because he wanted to attend some function on shore with his wife, asked to be given forty-eight hours to take off the cylinder covers, Captain Nares, as he then was, replied: "By all means." The chief engineer was jubilant,