One piece of egg-shell dug out of the highest trench is not sufficient evidence on which to base the supposition that the spot was frequented as a nesting-place.

At Glenmark, in the north of this province, the historic spot where the original (somewhat larger than the present) find of *Dinornis reliquiæ* was dug out by my predecessor, the late Sir Julius von Haast, the bones of numerous species of birds besides moas were found. Their occurrence in the situations where they were discovered, and the way in which they were lying—entire bodies with their sterna covering crop-stones *in situ*—have been explained by the supposition that the moas were overtaken by a fierce and sudden storm, and their entire carcasses piled by wind and flood into vast heaps, an explanation against which the presence here also of the same powerful buzzard and other flying birds rises as an objection. Yet there is nothing either in the situation or the disposition of the bones to make it impossible; still I cannot help feeling that that cannot be the true explanation which satisfies only one instance out of so many assemblages of dead birds of nearly always the same species in situations almost similar. I hope, however, that when I have made a thorough examination of all the localities where, and the conditions under which, moa remains have been found, in the light of the personal experience gained in the exhumation of the present deposit, and when I have completed the identification (on which I am now engaged) of the smaller bird bones associated in them with the moa bones, some light may have been gained on this at present mysterious episode in the history of the ancient Avians of New Zealand.

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THE BLUE HILL METEOROLOGICAL OBSERVATORY.[1]

THE *Annals* of this high class Meteorological Observatory for 1890 are of more than usual interest, since we have here presented not only the observations of the year, which are made with remarkable fulness and exactness, but also a well presented and discussed *résumé* by Mr. Clayton for the lustrum ending with 1890, together with an account of the hourly and other observations made at the Signal Service Station at Boston. The Observatory is situated about ten miles south of Boston, on the summit of a peaked hill 640 feet above the sea, and as the ground falls down from the buildings in every direction for several hundred feet, the Observatory occupies a unique position among Observatories in the investigation of some of the more important phenomena of meteorology.

The hourly means of atmospheric pressure show for all the months the double tide well marked. The chief maximum steadily recedes from 10 a.m. in winter to 8 a.m. in summer, and the chief minimum advances from 2 p.m. in winter to 5 p.m. in June. The evening maximum shows a slight tendency towards displacement in the same direction as the afternoon minimum, and the night minimum a similar displacement in the same direction as the morning maximum. A third barometric maximum, which is generally met with in middle latitudes, is particularly well marked at this place.

But the important position of this Observatory appears in the most striking manner on comparing the hourly barometric results of 1890 from the Blue Hill with those from Boston for the same year. The Blue Hill Observatory is situated on a true peak, but the station at Boston is in the mouth of the rather broadish valley which stretches northward from the town. The result is that, though the places are only about ten miles apart, the diurnal fluctuation at Boston is 0·017 inch greater than on the top of Blue Hill. In June, when this feature of the pressure is at the annual maximum, the following are the hourly results, where the plus sign indicates that pressure at Boston rose above its daily average by these amounts, expressed in thousandths of an inch, greater than did pressure on the Blue Hill above its daily average; and the minus sign that it fell lower by these amounts at the former than at the latter place.

	Diff.		Diff.		Diff.
1 a.m.	+ 2	9 a.m.	+ 6	5 p.m.	− 5
2 ,,	+ 3	10 ,,	+ 1	6 ,,	− 7
3 ,,	+ 8	11 ,,	− 1	7 ,,	− 5
4 ,,	+ 10	Noon	− 4	8 ,,	− 5
5 ,,	+ 10	1 p.m.	− 3	9 ,,	− 8
6 ,,	+ 10	2 ,,	− 5	10 ,,	− 4
7 ,,	+ 7	3 ,,	− 5	11 ,,	− 2
8 ,,	+ 6	4 ,,	− 7	Midnight	− 1

The explanation is that, during the night, cold air-currents flow down the sides of a valley and accumulate below, and thus a higher pressure is maintained in valleys during the night; but, on the other hand, during the day the valleys become more highly heated by the sun, and under the strong ascending currents thereby generated, pressure falls lower than in open situations. The amounts increase in proportion to the daily range of temperature, and as the mean velocity of the wind diminishes. This diurnal variation is greatest in the deep valleys of Switzerland and other mountainous regions, and, though small in amount is a well-defined and steady fluctuation in the valley of the Thames, as shown by a comparison of the Kew and Greenwich barometers. A weak point in the meteorological publications of the Signal Service of the United States is the all but complete absence of the results of the hourly phenomena of meteorology. In filling up this hiatus, the Blue Hill Observatory will prove of the greatest service, as offering a truly normal Observatory, at which, from its mere position, several disturbing elements affecting diurnal phenomena are eliminated.

During the whole year, the time of occurrence of the minimum temperature is very near sunrise; and it is interesting to note that the maximum occurs at all seasons from 2 to 3 p.m., approaching in this respect the time of the maximum at truly high-level Observatories, or at Observatories situated on peaks. For the five years, the mean monthly temperatures deduced from the maximum and minimum thermometers exceed those deduced from the hourly values every month, the smallest excess being 0°·2 in December, and the largest 1°·2 in August, the mean for the year being 0°·7.

The prevailing winds are north-westerly from February to April, southerly in May, and westerly and north-westerly for the other months. These winds are ruled by the different distributions of atmospheric pressure over the Atlantic and America in the respective months; these being in winter the low pressure round Iceland, and the high pressure over the United States and Canada; and in summer the high pressure in mid-Atlantic, together with the low pressure over the Middle States. The hourly frequency of each wind has been worked out for the lustral period, with results that are very suggestive. The period is sufficiently extended to give fairly good averages, from which accidental phenomena may be regarded as eliminated; and the result is more completely attained by the height of the Observatory above the surrounding country all round removing from the observations the more purely local causes of disturbance. The mean hourly frequency of each wind shows a clear tendency of the wind to veer around the compass each day. Thus, the greatest frequency of southerly winds occurs at 8 p.m., south-westerly at 10 p.m., westerly at 1 a.m., northerly at

[1] "Annals of the Astronomical Observatory of Harvard College," vol. xxx., Part 2, "Observations made at the Blue Hill Meteorological Observatory, Mass., U.S., in the Year 1890, under the direction of A. Lawrence Rotch, Esq." With Appendices. (Cambridge: University Press 1891.)

5 a.m., north-easterly at noon, easterly at 2 p.m., and south-easterly at 7 p.m., and this occurs winter and summer, and is independent of the sea breeze.

This points plainly to a cause in daily operation, which the unique position and work of the Blue Hill Observatory enable us to deduce from a comparatively few years' observations. This cause is the diurnal barometric tide, with its two maxima and minima, which, as regards the Blue Hill, are more pronounced over the land to westward than over the ocean to eastward, and become still more pronounced on advancing southward into lower latitudes and westward into more inland situations. Thus, at 9 a.m., the time of the morning maximum, pressure at the Blue Hill is 0·023 inch above the daily mean; at New York, 0·028 inch; at Philadelphia, 0·031 inch; and at Washington, 0·035 inch. Now at this physical instant, 9 a.m. local time, this atmospheric tide becomes relatively less and less on advancing eastward across the Atlantic, and at Kew (about 2 p.m. G.M.T.) pressure is 0·012 inch below its average. From its position with respect to this wide-spread shallow diminution of pressure, northerly and north-easterly winds attain their diurnal maximum frequency at this hour. Again, at the Blue Hill, pressure falls to the daily minimum at 3 p.m. (local time), after which it continues slowly to rise; and, while rising, pressure is relatively lower to the westward. From its position in the north-easterly segment of this wide-spread area of lower pressure, the south-easterly winds at the Blue Hill attain their daily maximum frequency at 3 p.m.

The mean maximum velocity of the wind, about the rate of twenty-two miles an hour, occurs from November to March, and the minimum, nearly fifteen miles an hour, from June to August. As regards the hourly velocity of the wind, the records show the occurrence of the daily maximum at 3 p.m., being the hour of occurrence generally, except at high-level Observatories; but the time of the minimum, 8 a.m., is markedly different. This peculiarity arises from the curious but highly interesting fact that the Blue Hill shows a secondary maximum immediately after midnight, or the time when the daily maximum velocity occurs at high-level Observatories, thus linking the Blue Hill Observatory with both high and low level Observatories.

There are also published valuable results of humidity, cloud, sunshine, rain, gales, thunderstorms, and visibility of distant objects, for which we must refer to the Report itself. As the Meteorological Service of the United States has recently taken a new departure, it is to be hoped that Mr. Rotch, who has generously established this Observatory, and has its admirable work well in hand, will yet see his way to the continuance of the tabulation and publication of the hourly values of the elements, which cannot but prove to be of essential service to the Department in carrying out certain developments of American meteorology which, it is understood, are under consideration.

GUSTAV PLARR.

ONE of the older generation of mathematicians has lately passed away in the person of Dr. Gustav Plarr, who died at Tonbridge on January 11, of bronchitis following influenza. He was born on August 27, 1819, at Kupferhammer, a country house near Strasburg. He was educated at the Gymnase and at the University in that city, whence he proceeded to Paris University, where he obtained his diplomas as Licentiate of Sciences and as "Docteur ès Sciences Mathématiques." Among his close friends at school and at the University was M. Wurtz, while M. Gerhardt, another great chemist, was among his Strasburg contemporaries. Dr. Plarr for some time meditated a life of chemical research, but found that his health would not permit of prolonged laboratory work. After taking his doctorial degree, he was for some time mathematical master at a College at Colmar, and, on the Chair of Mathematics becoming vacant in the University of Strasburg, was one of the candidates for the post. He was strongly supported by the Strasburg academic party, especially by M. Sarrus, the outgoing Professor, but clerical influences were at work against him, and a Parisian was finally imposed on the little Germanizing University.

In 1857, Dr. Plarr married an English lady, and during his honeymoon in Dublin was introduced to Sir William Rowan Hamilton, the originator of the Quaternion method, and became thenceforth a devoted student and exponent of the work of that great genius.

The British Association met at Dublin in the autumn of 1857, and Dr. Plarr was one of the eight foreign men of science who were that year elected "Corresponding Members." Whewell, Hamilton, Vignoles, and Brewster were, we believe, his sponsors on this occasion. The paper then communicated by him to the Mathematical Section of the Association will be found at p. 101 of the Report.

The other seven men of science elected at this meeting were Barth, Bolzani, d'Abbadie, Loomis, Pisani, and the two Schlagintweits. Of these, only Herman Schlagintweit survives. Indeed, at the time of his death, Dr. Plarr was one of the half-dozen oldest living "Corresponding Members" of the British Association.

In the Franco-German war of 1870, Kupferhammer was burnt by the French, in order to dislodge Prussians who had been able thence to command the sluices of the moat round Strasburg. Dr. Plarr accordingly came to reside among his wife's relatives, first at St. Andrews, and then at Tonbridge.

Since 1870, Dr. Plarr's time was almost exclusively devoted to the study of Quaternions. In 1882–84 his French translation of Prof. Tait's Treatise was published by Gauthier-Villars. Several papers by him, on abstruse points connected with the Quaternion method, were communicated to the Royal Society of Edinburgh. Beside these there is a very interesting piece of ordinary analysis connected with Spherical Harmonics.

Modest, unambitious, studious, simple in his habits to the verge of asceticism, Dr. Plarr was of a type rare in these days and in this country. Although a man of wide scientific culture, and of many literary interests, he was content to be a pioneer in a realm of thought for which there is necessarily no popular sympathy at present. Quaternions, indeed, were to him the mathematics of the future, and he was to the last happy in the thought that he had assisted, however obscurely, in their development.

NOTES.

TWO international scientific Congresses are to be held at Moscow in August. One will relate to anthropology and archæology, the other to zoology. There will be exhibitions in connection with both Congresses, and appeals have been issued for the loan of objects which are likely to be useful and interesting. Among the things wanted for the Anthropological Congress are phonograms of the language and songs of different races. French will be the official language of the two meetings. The more important papers will be printed before members come together, so that discussion may be facilitated.

THE death, on February 20, of Prof. Hermann Kopp is announced. He died at Heidelberg, after a long and painful illness, in the seventy-fifth year of his age.

THE well-known botanist and philologist Stephan Endlicher was buried in 1849 in a churchyard near Vienna. This churchyard is about to be closed, and it is proposed that Endlicher's remains shall be removed to the new central cemetery