storm; but, except when the advent of a vortex can be distinctly traced to the highlands of the western frontier, it seems very likely that its development and duration are in some degree influenced by the local conditions of the land surface, such as have been already noticed in the case of the Northern Punjab; and its intensity would seem to be mainly dependent on the amount of snow and rain that is precipitated.

From what has been said above, the general resemblance of the winter storms of Northern India to those of our own latitudes will be sufficiently obvious. In their eastward movements, the localization of the rainfall, the contrasted temperature conditions of the opposite quadrants, and many other particulars, we may recognize their essential identity. But certain features which are more or less blurred in our European storms, in those that we are now dealing with stand out with much clearer definition; and they seem calculated to throw not a little light on the still vexed question of storm generation, and perhaps to reconcile some of the very conflicting views that now prevail on this subject. As Mr. Lewis Morris says of the old Greek myths—

"These fair tales which we know so beautiful
Show only finer than our lives to-day
Because their voice was clearer and they found
A sacred bard to sing them"—

so may we say of these manifestations of aërial action in India. The phenomena are similar in kind to those that pass before our own eyes, but they stand out, accentuated by the circumstances of the climate and country, with a clearness and prerogative emphasis that we may seek for in vain in the confused and kaleidoscopic weather phases of these latitudes. We read their meaning almost at a glance, as we gather that of a printed page, and have not laboriously to pick out and piece together the obscure facts that express it, as with painful effort we might decipher the faded and half-concealed characters of a monkish palimpsest. And by good fortune, we have at the head of the Indian Meteorological Department an accomplished mathematician and physicist, who appreciates to the full the rich opportunities of his charge, and who knows how to marshal and interpret his facts as well as record them.

HENRY F. BLANFORD.

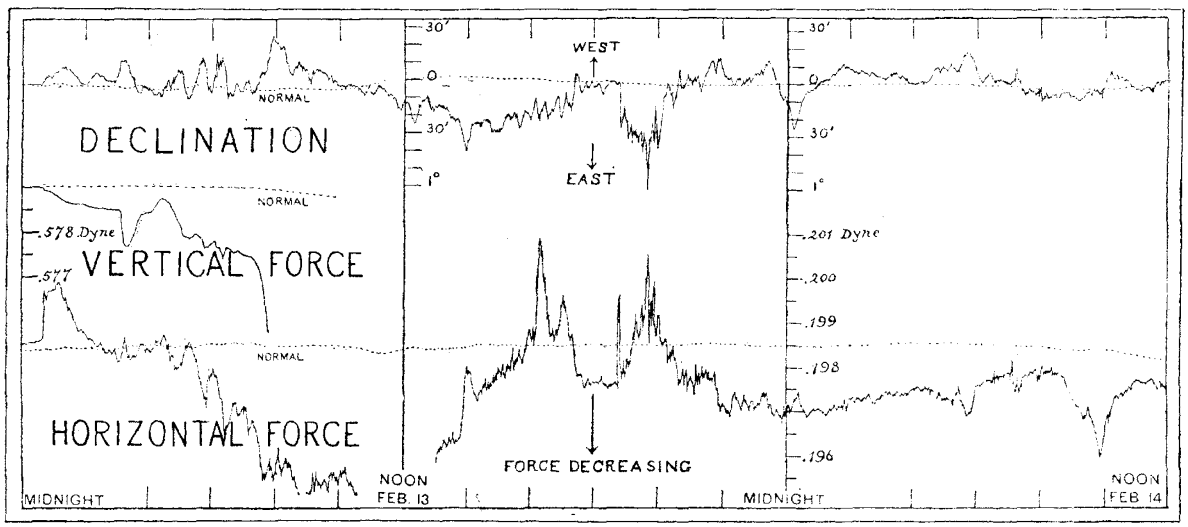
THE MAGNETIC STORM OF FEBRUARY 13-14, 1892.

THE Superintendent of the U.S. Naval Observatory sends us the following records of the magnetic storm of February 13:—

"The records of this unusually severe magnetic storm are of especial interest as occurring at the same time as the fine displays of auroræ and the appearance of a large group of sun-spots.

"The first increase in the horizontal force was followed by a rapid decrease, the force falling to much less than its usual strength, with rapid changes. Its change during the storm was 2½ per cent. of its mean strength. The vertical force decreased so much that the sensitive balanced magnet used to record it was upset at 8 p.m. of the 13th, and its further record lost.

"The auroræ were seen at Washington at about 2 a.m. and 7.30 p.m. of the 13th, the latter time being marked by an unusually disturbed condition of the magnets."



"The magnetic storm commenced suddenly at 12.40 a.m. (75th meridian time), February 13, with a movement of the north end of the declination magnet to the westward, and a rapid increase in the horizontal and decrease in the vertical components of the earth's magnetic force.

"The north end of the declination magnet remained to the westward of its normal position until 10.30 a.m., when it crossed to the eastward, all the time oscillating violently, and did not return to the normal until 8 p.m. of the 13th, after which it kept oscillating on each side of its mean position until the end of the storm. It registered a change of direction of 1½°.

WILLIAM DITTMAR.

ALL who take an interest in the progress of chemistry will regret the death of William Dittmar; a smaller circle feel that they have lost an invaluable friend. Born at Umstadt, near Darmstadt, April 15, 1833, he was the second son of Fritz Dittmar, then Assessor at Umstadt, afterwards Landrichter at Ulrichstein, in Ober-Hessen, where he took a part in the movements of 1848 displeasing to the Hessian Government, who removed him from office, allowing him to retire on a pension. At the age of sixteen, therefore, William became a resident in

Darmstadt, where his father spent his enforced leisure. He was apprenticed to the Hof-Apotheker in Darmstadt, and in due time passed his "Gehülfe Examen" with distinction. He had access to a good collection of books on chemistry and physics, which he eagerly read. He went as Gehülfe to Mühlhausen in Alsace, where he spent several years, and returning to Darmstadt passed the "Staats Examen" in pharmacy, passing in the first class. But the attraction of pure chemistry prevailed, and in 1857 he went to Heidelberg. Bunsen soon saw what kind of student he had got, and appointed him assistant in the laboratory. There he met Sir Henry Roscoe, who invited him to Manchester as his private assistant. On Roscoe's appointment as Professor of Chemistry in the Owens College, Dittmar went with him as assistant. In 1861 he became chief assistant in the Edinburgh University Chemical Laboratory under Prof. Sir Lyon Playfair. In 1869 he went to Bonn, where he acted first as *Privatdocent* and afterwards as Lecturer on Meteorology at the Agricultural College at Poppelsdorf. In 1872 he declined the Chair of Chemistry in the Polytechnic School at Cassel, preferring to return to Edinburgh to his old post in the University. Here he remained only a few months, accepting in 1873 the Lectureship on Practical and Technical Chemistry in the Owens College. Thence he removed to Glasgow to succeed Prof. Thorpe in the Chair of Chemistry in the Andersonian College. This office he held till his death, February 9, 1892. He died literally in harness. He lectured in the morning, but not feeling very well, went home in the middle of the day, and after a few hours' illness died at 11.30.

He was a Fellow of the Royal Society and of the Royal Society of Edinburgh. In 1887 the University of Edinburgh conferred on him the degree of Doctor of Laws. The Philosophical Society of Glasgow awarded him last year the Graham Medal for his investigation into the composition of water.

Dittmar was a man of great intellectual energy, which always took a practical turn, indeed it is rare to see a man so truly scientific in all the operations of his mind so free from speculation. Not that his imagination was unused, but so prominent before him was the practical result to be obtained, that it gave a character of reality to the whole process by which he sought to reach it.

His most important work was analytical. His great investigation into the composition of the specimens of sea-water collected by the *Challenger* Expedition is a masterpiece of judgment and skill, important not only for its results, but perhaps even more for its methods. We may mention also his determination of the atomic weight of platinum, his method for the analysis of chrome iron ore, his examination of the alkaline hydrates and carbonates, and the gravimetric determination of the composition of water. But he did not confine himself to analytical work. He published along with Kekulé a paper on oxymethylbenzoic acid, the first aromatic alcohol acid; and also while at Bonn obtained glutaric acid by the reduction of Ritthausen's glutanic acid. He did much excellent work in physical chemistry. We may mention the determination of the vapour-pressures of formate of ethyl and acetate of methyl, his work on the dissociation of sulphuric acid and on the relation of the composition of acids of constant boiling-point to the pressure under which they are distilled. He made the construction of the balance a subject of special study, and the balances constructed for him by Oertling and by Staudinger are models of convenience and accuracy.

But Dittmar was greatest as a teacher. Patient and careful, he helped his students where they needed help, and led them to think and work for themselves. He had no ambition to make his pupils analyzing machines; they had to understand all that they did. Gradually his great power as a teacher came to be appreciated, and latterly his laboratory was filled with enthusiastic pupils. Those whom he has trained are his real works on analytical chemistry; but others can learn much of his method from his admirable treatise on qualitative analysis.

A. C. B.

SERENO WATSON.

THE last American mail brought the sad intelligence of the death of this indefatigable botanist, upon whom, in one sense, the mantle of Asa Gray fell barely four years ago. Early in the year he was seized with a bad attack of *grippe*, and although he rallied and was better for a time, he never recovered strength, and finally succumbed on the 9th inst., in the sixty-sixth year of his age. Of his early life we know nothing, but he appears to have published no botanical work previous to 1873, about the period that he was appointed Herbarium Assistant to Dr. A. Gray at Harvard. From that date, however, onward until within a few months of his death, he was, next to Gray, the most active writer on North American Phanerogams. Much of his work appeared originally in the Proceedings of the American Academy of Arts and Sciences, under the title of "Contributions to American Botany," numbered consecutively, the last being the eighteenth. These consist principally of monographs of North American genera and descriptions of novelties. He was also the principal author of the "Botany of California," the last volume of which appeared in 1880; and since the death of Dr. A. Gray, he in conjunction with Prof. J. M. Coulter has edited the sixth edition of the deceased author's valuable "Manual of the Northern United States." This work has been considerably decried by contemporary American botanists, because Watson did not introduce the changes in nomenclature consequent on a strict and unqualified observance of the law of priority. But in this conservatism he doubtless followed the wishes of his former master, and enjoyed the sympathies of those whose experience teaches them that it is much easier to make these changes in books than to carry them into practice. Watson had a still more important work in hand, for he had undertaken the continuation of Gray's "Synoptical Flora of North America." How far this is advanced we do not know, but it is not probable that it will see the light on the same lines as the published volumes, or as he would have continued it. Unfortunately, an exceedingly useful work, commenced during the early part of Watson's engagement at Harvard, was never completed. We allude to his "Bibliographical Index to North American Botany," which was only carried to the end of the Polypetalæ. To a great extent, Gray's "Synoptical Flora" takes its place, so far as the Gamopetalæ are concerned; but it is difficult to find one's way in the remaining groups. Though Sereno Watson was of a retiring disposition, and did not belong to the teaching body, nor take a prominent part in the gatherings of scientific men, yet the loss of him will be widely felt and deplored. He was elected a Foreign Member of the Linnean Society of London in 1890, but he was not a man who craved after honours and distinctions.

NOTES.

IT seems almost incredible that the Treasury should think of stopping the publication of the *Kew Bulletin* simply because it does not quite pay its own expenses. The periodical, as our readers know, is one of high value, both from the scientific and the industrial point of view, and, if the Treasury persists in the design attributed to it, something ought soon to be said on the subject in Parliament by the scientific members. The *Times* has argued strongly against the proposed step, and the view it has expressed will be shared by all who are capable of forming