frontal moraines. That map is entitled 'Verbreitungsweise der Alpen-fündlinge,' and its author is the modest and very able geologist, A. Escher von der Linth.

Since 1850, Gastaldi for Piemont, Chantre and Falsan for France, and A. Favre for Switzerland, have given maps of the ancient extension of the Alpine glaciers, which render Guyot's manuscript map obsolete and valueless, except as an historical document.

To finish this already too long review of glaciers and glacialists, I will add, that, after the three original memoirs of Venetz, de Charpentier, and Agassiz, of 1833, 1834, and 1837, the other important works and landmarks in the discoverics and exposition of the glacial question are, by order of data, 1°, 'Théorie des glaciers de la Savoie,' by the Chanoine Rendu (September, 1840); of this most important and excellent work, Tyndall said to me at the Geneva meeting of the Swiss naturalists in 1865, "If Rendu had been trained and educated as a physicist, he would have left nothing for others to do;" 2°, 'Etudes sur les glaciers,' by Louis Agassiz (October, 1840); 3°, 'Essai sur les glaciers,' by Jean de Charpentier (Oct. 31, 1840; issued in December, 1840, with the date on the titlepage of 1841); 4°, 'Travels through the Alps of Savoy,' by James D. Forbes (1843; second edition, 1845); 5°, 'Nouvelles études et expériences sur les glaciers actuels,' by Louis Agassiz (November, 1847); 6°, 'The glaciers of the Alps,' by John Tyndall (1860).

Venetz was personally known to but few *savants*. I will add that he was a Valaisan engineer of great skill. He had the charge of rectifying and embanking the Rhone in the cantons of Valais and Vaud, from Sion and Martigny to the lake of Geneva, — works which he executed most successfully. Accustomed to observe all that relates to the freshets of mountain torrents and glaciers, a spectator of the great 'débacle de Bagnes' in 1818, he and his friend de Charpentier put a stop to the constant ravages of the Getroz glacier and the Dranse River, an affluent of the Rhone.

Venetz's modesty was extreme, and verging on great timidity, due perhaps, in part, to the infirmity so common in the Valais, and from which he was a sufferer. Not educated as a scientific man, but only as a road engineer, he did not possess the scientific method of marshalling and classifying facts and observations. But Venetz found in his friend de Charpentier the best man to systematize and construct a new science. In that respect de Charpentier, by his knowledge and education, was the equal and rival of his friends Alex. de Humboldt, Leopold de Buch, and Elie de Beaumont; and the association of Venetz with him was most happy and successful. Both without ambition, lovers of nature and truth, they created together what may be called now one of the most interesting branches of geology and physical geography.

JULES MARCOU.

Cambridge, Mass., July 7.

Barometer exposure.

It is gratifying to find that my brief letter calling in question the influence of wind on the indications of indoor barometers has elicited very satisfactory responses from Messrs. Gilbert and Clayton (*Science*, vol. vii. pp. 571, 572; and vol. viii. p. 14). There is one point, however, on which evidence is still wanting to fortify Mr. Clayton's induction.

As clearly indicated by Mr. Gilbert, it is evident, that, according to the conditions of exposure, the influence of the wind must tend sometimes to increase, and at other times to diminish, the pressure within the building in which the barometer is placed. Now, all of Mr. Clayton's experiments seem to indicate a lowering of the barometer-readings within the building. Perhaps he may be able to verify the deductions of theory by so arranging the conditions of exposure as to secure the opposite effect, and thus obtain a complete verification of his induction. If these opposite effects can be verified by experiment, while establishing the influence of wind as a true cause of barometric fluctuations, they would render it extremely difficult to apply a correction correlated with the velocity of the wind, except under well-defined conditions of exposure.

While seeking for possible causes of fluctuations of the barometric column in relation to wind-velocity, it may be well to recall the idea first broached by Hawksbee near the beginning of the last century, and more distinctly urged by Sir John Leslie, that the barometer is depressed by wind in consequence of the centrifugal force due to the horizontal current of air (Daniell's 'Elements of meteorology,' vol. i. pp. 4–9, London, 1845); for although Professor Daniell's criticism of Professor Leslie's theory is quite just, in so far as it relates to the idea that the effect would be 'accumulated by a long series of deflections,' yet the main fact, that the tendency to rectilinear motion would give rise to a centrifugal effect, remains a *vera causa* tending to depress the mercurial column.

A simple calculation shows, however, that the radius of curvature is so large, or the deflection from a tangent is so small, that a horizontal wind of 60 miles per hour, or 88 feet per second (assuming the whole thickness of the atmosphere to be involved), would lower the mercury in the barometric column only about 0.00875 of a millimetre, or 0.00034 of an inch, — an amount so small as to be far within the limits of observational error, and therefore quite inadequate as an explanation of the phenomenon.

JOHN LECONTE.

Berkeley, Cal., July 13.

Bright lines in the spectrum of β Lyrae.

A short study of the spectrum of β Lyrae presents the following bright lines as existing in her atmosphere. A portion are probably also found in the solar atmosphere. Referred to by their numbers in Young's catalogue, they are, 2, 3, 5, 22, 36, 41, 49, (58–59), 69, 74, 86, 100, (105–106), 115, (138–139), (140–141), 181, 189, 193, 198, 208, 248, (260–261), 267, (272–273?). Another portion find no place, or are infrequent, in the solar atmosphere, and, referred to by their approximate wave-lengths, are 59549, 58398, 57967, 57544, 56305, 55829, 54811, 51355, 51013, 50858, 50582, 49582, 47939, 47660, 47437, 46879, 45203, 43123.

Each of these appear in at least 40 per cent of the observations; none appear in more than 70 per cent. A number more are suspected, but are not clearly separated.

At present there would seem to be a connection between the variability of the star and the lines present in the spectrum; but on this point the observations are not final.

O. T. S.

New Haven, July 17.