LXIX. On the barometer

Richard Walker Esq.

To cite this article: Richard Walker Esq. (1810) LXIX. On the barometer, Philosophical Magazine Series 1, 36:151, 376-378, DOI: 10.1080/14786441008563209

To link to this article: http://dx.doi.org/10.1080/14786441008563209

Published online: 18 May 2009.

Submit your article to this journal

Article views: 2

View related articles

Full Terms & Conditions of access and use can be found at http://www.tandfonline.com/action/journalInformation?journalCode=tphm12

To Mr. Tilloch.

Sir, In consequence of its having been intimated to me, that a short rationale, or general view of the various changes in the weather, and the indications of the barometer, as connected with them, might not be unacceptable, I beg leave to transmit the following, which may be considered as an appendage to the paper "On the Application of the Barometer for indicating the Weather, &c." you did me the favour to insert in your last Number.

Water exists in the atmosphere in two different states, viz. 1st, in a state of chemical combination; that is, so completely incorporated with the air, as to form with it one homogeneous transparent fluid;—and, 2dly, in a state of mechanical combination; which is, when the minute particles of water are merely suspended in the air, forming that state of the atmosphere, which is denominated cloudy or misty.

The dense state of the air being fittest for the chemical combination above mentioned; clear, dry weather, generally speaking, accompanies the higher degrees of the mercury in the barometer, whilst, a rare state of the air being less capable of receiving the water into chemical combination, it is then merely suspended in a state of mechanical combination, forming clouds, mists, &c.

Hence it follows, that, when the mercury stands at or near fair, clear dry weather is indicated generally; and when at or near rain, cloudy or wet weather; and when fluctuating mid way, changeable weather.

It occasionally happens, however, that the atmosphere is cloudy, and even wet, whilst the barometer is as high as fair; and clear and dry, whilst the barometer stands as low as rain. The reason of this, in the first instance, is, that the air, having become replete or over-loaded with water, is incapable (by an alteration of temperature, viz, the air and its contents having become colder) of retaining or suspending it in a state of chemical combination; and in the latter case, which happens after rain, succeeding a continued dry state of the atmosphere, which having swept down the vapour with it in its descent; the air, though then in a rarer state, is yet sufficient to retain the proportion of water, now much reduced in quantity, in a state of chemical combination.

The
The particular or more immediate indication of the weather which is coming, arises from the alteration which is taking place in the density of the atmosphere, and which the barometer exhibits by the rising or sinking state of the mercury; the weather becoming comparatively clearer as the atmosphere is becoming denser, and duller as the atmosphere is becoming rarer.

Hence, if the barometer were as portable and as convenient for reference as a watch, we should seldom be at a loss to know, at least for short intervals, what kind of weather was coming.

The ordinary range of the barometer in this climate is from Rain to Fair; rising however, occasionally, as high as Settled Fair; and sometimes, though very rarely, as high as Very Dry: and sinking, occasionally, as low as Much Rain; and sometimes, though very rarely, as low as Stormy.

It is scarcely necessary to observe that north and east winds, in consequence of passing to us from a colder climate, and over land, bring a denser, colder, and dryer atmosphere; and south and west winds, coming to us from a warmer climate, and over the sea, bring a rarer, warmer, and damper atmosphere; and moreover, that the capacity of air for retaining water in a state of chemical combination is increased by coming from a colder to a warmer temperature; and diminished, by coming from a warmer to a colder temperature.

It must be equally apparent, that the greater or less elevation of the clouds depends upon their own degree of density, and that of the atmosphere which supports them.

With regard to the immediate causes of the direction and changes of the wind in this climate, I consider them as involved in too much obscurity and uncertainty to say anything satisfactorily about them; and with respect to electricity, which though doubtless a powerful agent in meteorological effects, I consider it rather as a matter of curious speculation than of practical utility.

I have therefore only to add, that by a due consideration of the causes enumerated above, connected with the more obvious
Reflections on some Mineralogical Systems.

Obvious effects of the sun's varying influence in raising and dispelling vapours, we may, I think, account pretty satisfactorily for the various vicissitudes of weather, which mark the different seasons throughout the year; and, by the relation of the barometer to those causes, be enabled to foresee, with a considerably greater degree of certainty than is commonly supposed, the different changes of weather which are, at all times, about to take place.

I am, sir,
Your obedient servant,

Queen-street, Oxford, Nov. 17th, 1810.

Rd. Walker.


[Continued from p. 303.]

Supposed defects of the Crystallographical System.

M. Haüy has been reproached for his principle of specification and his definition of the species: one alleging that, according to him, muriated soda and sulphated lead are of the same species; another, that the two indications of the species are often in contradiction, and that the same form of molecule does not always accompany the same chemical composition, and vice versa. Some do not like the octaëdron for a primitive form, because, to preserve unity of form in the integral molecule, it is necessary to suppose empty spaces; others, in short, reproach him with the difficulty of finding all the directions of the cleavage (or the construction of the cleft), and the system also with a want of generalization; and finally, as a dernier resource, that we must return to the system of external characters.

Will it be believed that I have heard the first of these objections made by a celebrated philosopher, a professor who draws around him from all parts of the world the zealous lovers of mineralogy, and who repeats it at least once a year in his public lectures? that I have seen it printed and published in a work which passes for one of the best on the systems of this professor? It is of German origin, and proceeds, no doubt, from the circumstance that they have not yet learned to count even to two on their fingers; a great misfortune for a philosopher. Identity of form in the integral molecule,—this is one condition in order that two minerals