

Where do we stand in Brückner's Weather-cycle?

THE problem of future weather is one which has a fascination for many. Our present inability to get beyond (or much beyond) the daily forecast, may well, at times, seem a reproach, considering the immense amount of industry that has been given to weather studies. Where is the professional meteorologist in this country (we vainly ask), who, on the basis of some cycle, or proved recurrence, or other facts, will tell us, even in the most general way, what the coming years have in store for us?

Yet the time may not be so very distant, I think, when science will be able to say, *Nous avons changé tout cela*. The evidence of cycles is growing; and their character is being more exactly fixed. An attentive reader of that excellent record, the *Meteorologische Zeitschrift*, may observe, now and again, a feeler (so to speak) put forth into the obscure; a serious attempt to extend the range of prevision, a suggestion, by some well equipped mind, as to the course of weather in coming years or seasons. Have we not in such the hopeful beginnings (hopeful even in case of failure) of a new and difficult art?

There are two weather-cycles, which have lately been (shall I say?) knocking for admittance; that of 11 years, and that of 35 years. It is well to bear in mind that these are not mutually exclusive. They may be found to usefully supplement and help each other.

Brückner's views as to the recurrence, at intervals of about 35 years, of cold and wet periods, alternating with warm and dry ones, seem to have hardly received, as yet, in this country, the attention which they deserve. They are destined, I believe, to have a large influence on future thought about such matters. It may be useful to ask how our London weather is related to this 35 years' cycle; and I propose to do so here from the standpoint of barometric pressure.

The method adopted is this: Each month, in a long series of years (from 1786), is first characterised as + or -, according as its pressure has been above or below the average. (Tables by Eaton and Glaisher have been used for the purpose.) Then the plus months in each year are counted, and the series of numbers so obtained is smoothed by additions of 10 (i.e. adding the first 10, then from the 2nd to the 11th, the 3rd to the 12th, and so on, each sum being put down in the fifth place). This gives us the dotted curve A in the diagram, in which may be seen, underlying minor variations, a succession of long waves. The general outline of these waves may be more clearly brought out by a further smoothing process (continuous curve).¹

In order to clear understanding of this curve A, consider, for a moment, its lowest point, that for 1842; this means, that, in the 10 years, 1838-47, there were 50 months of + barometric pressure, out of 120. Similarly, the highest point (that for 1891), means that in the 10 years 1887-96, there were 67 months of + pressure out of 120.

Note the intervals between minima of this curve A. From 1813 to 1842, 29 years; 1842 to 1876 (34 years). Or, taking the twice-smoothed curve, we get 35 and 32 years. On the other hand, the two completed waves are approximately bisected by the vertical lines for 1830 and 1860 (interval 30 years).

At the top of the diagram are two linear series representing, the one, Brückner's warm and cold, the other, his dry and wet, periods (warm and dry, continuous lines, cold and wet, dotted lines). These two series, for temperature and rainfall, are not, it will be seen, exactly coterminous; the latter tend to lag somewhat on the former. Brückner's general figures may be given, so far as they here concern us.²

Temperature.		Rainfall.	
Warm ...	1791-1805 (15 yrs.)	Dry ...	1781-1805 (25 yrs.)
Cold ...	1806-1820 (15 ,,)	Wet ...	1806-1825 (20 ,,)
Warm ...	1821-1835 (15 ,,)	Dry ...	1826-1840 (15 ,,)
Cold ...	1836-1850 (15 ,,)	Wet ...	1841-1855 (15 ,,)
Warm ...	1851-1870 (20 ,,)	Dry ...	1856-1870 (15 ,,)
Cold ...	1871-1885 (15 ,,)	Wet ...	1871-1885 (15 ,,)

Now, it will be noticed that our barometer curve A at its lowest points is generally about the middle of the cold periods, while the middle of the waves is about the middle of the warm periods. Also, that the parts of the twice-smoothed curve above the average line are about coterminous with warm periods; while the parts below the average line are in general coterminous with cold periods.

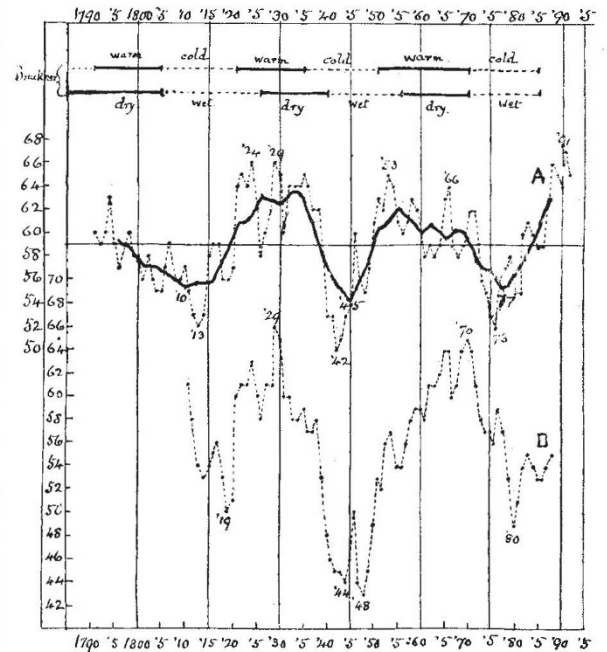
¹ Here the sum of 10 items is put down in the sixth place.
² *Klimaschwankungen*, p. 236.

It is surprising, I think, that an agreement so considerable can be brought out by a method so rough

Do not these facts throw some light on the future? An interval of 35 years from the last minimum, 1876, brings us to 1911, about which time (perhaps a little earlier) we might fairly look for another minimum, the middle of another cold and wet period. At present we are still, apparently, in the warm and dry period commencing about 1886, and probably near the end of it, as (say) 15 years from 1885 brings us to the end of the century. We next enter (by programme!) on another time of cold and wet, with preponderance of low barometers. Thus our curve A should be turning down soon towards its next minimum (situated somewhere between 1906 and 1911).

The rainfall aspect of the current warm and dry period may be put thus: Of the fifteen years, 1883-97, twelve have been dry, and only three wet. 1882 seems to mark the end of a long time of preponderance of wet years.

The curve B is one for Paris, made out in the same way as A (the data, however, extending only to 1893). It shows much the same kind of fluctuation. One curious feature is a lag in the three minima behind those of the London curve.



Regarding barometric pressure in these regions, Brückner considers that in a dry period there is a deepening of the usual cyclone in the North Atlantic (on an annual average), and an intensifying of the ridge of high pressure reaching from the Azores to the interior of Russia, especially in Central Europe; also a general increase of amplitude in the yearly variation (*Klimaschw.*, p. 217). In wet periods, the pressure differences (both from place to place and from season to season) are lessened.

There can be little doubt that this cycle of Brückner's touches life at many points, and that a promising field of study is thus opened up. Take health for example. Brückner himself shows how the mortality from typhus at Bâle has varied with the cycle (being worst in the dry periods). In a recent valuable work on epidemic diphtheria, Dr. Newsholme correlates the mortality from that disease in England with the thirty-five years' cycle, showing that a succession of dry years afford the most favourable conditions for growth of the disease.

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Soakage into Glazed Porcelain.

I MIX salt with water for occasional gargling, and keep it in a porcelain pot with a lid. Some weeks ago I began to use for the purpose a small well-glazed pot, in which cold cream had been bought a long time since. It was thoroughly washed by a