

## 9. Weather and Climate.

The weather of Britain depends largely on the distribution of atmospheric pressure over these islands. To put the matter in its simplest form, when the barometer is high we expect good weather, and when the barometer is low we expect wet and stormy weather. These two types of weather correspond respectively to a condition of high atmospheric pressure or anticyclone, and a state of low atmospheric pressure or cyclone. The winds in a cyclone are often strong, and swirl round the centre of lowest pressure in great spirals with a direction opposite to that of the hands of a clock. When anticyclonic conditions prevail, the winds are light and move round the area of highest pressure in the same direction as the hands of a clock.

Generally speaking, we may say that the winds of Scotland throughout the year are controlled by three fairly permanent pressure centres. There is a low pressure area south of Iceland, an Atlantic high pressure area about the Azores, and a Continental area in eastern Europe and west Asia, that is high in winter time and low in summer time. In winter as a rule the Icelandic and the Continental centres predominate, as they are then working in harmony. The tendency of both centres is to draw the air in a great swirl between them from south-west to north-east. Therefore we find that in winter south-west winds predominate in Scotland.

Occasionally the Continental anticyclone spreads as far as Scotland, and then for a few days in winter we

experience clear skies (with dense fog in towns), keen frosts, and very light winds. All too soon the Icelandic cyclone centre reasserts itself, and we are back again to storms of sleet or rain with a higher temperature. In summer the Atlantic high pressure centre has more influence. It tends to draw the winds more to the west, sometimes to north-west. This high pressure area with its accompanying fine weather is now at its most northerly limit, and occasionally spreads over these islands, reaching the south of England frequently, but not so often extending to Scotland.

To sum up then, we find that on the whole the prevailing winds of Renfrewshire are westerly and south-westerly. In winter, south-west winds are by far the most common, and our heavy gales are nearly always from the south or south-west. This is due to the presence of a cyclone or area of very low pressure to the north-west of Britain. The wind whirls round the low pressure centre and thus a south-west gale is experienced in Britain. In summer there is a shift of the winds towards the north, with the result that winds from the west predominate. Easterly winds are commonest in late spring and early summer. In May they are more frequent as a rule than winds from any other direction. In many parts of the country the trees are inarticulate but convincing recorders of the prevailing wind direction. They grow with their branches pointing east or north-east away from the wind. The branches of the tree shown in the photograph on p. 56 point almost exactly north-east.

It is a general belief in this country that storms are more frequent and violent at the time of the equinoxes

than at any other time. The phrase "equinoctial gales" is heard so frequently that the assumption it implies is accepted without question. It is an interesting point, therefore, to consider if the phrase is truthful. Examination of actual records proves that the so-called equinoctial gales are mythical. Storms are not more frequent at the equinoxes than at any other time. This has been clearly



Tree near Barrhead showing S.W. wind

shown in America, where the myth is also well established; but the splendid series of weather records kept at Glasgow University Observatory during the last forty years are quite convincing on the point. They show that storms are most frequent in winter and least frequent in summer. The maximum number occurs in January, and the number decreases steadily till June and July, then rises steadily again to January.

The prevailing south-west winds of this country in winter have much to do with our favourable winter climate. The climate of the British Isles in winter is milder than that of any other part of the world in the same latitude. The following comparison will illustrate this very strikingly. Aberdeen and Nain (Labrador) are in the same latitude. The mean temperature of the coldest month at Aberdeen is  $35^{\circ}$  F., or *three degrees above the freezing-point*. The mean temperature of the coldest month at Nain is  $-4^{\circ}$  F., that is *thirty-six degrees below freezing-point*. Most of us learned at school that our good fortune as regards climate was due to the beneficent influence of the Gulf Stream, but in recent years this explanation has been abandoned. It is a myth as fanciful as the supposed equinoctial gales. The Gulf Stream becomes a negligible factor a little to the east of the Newfoundland Banks. Our true benefactor is the wind. In winter time the south-west winds blow from the warm southern regions of the Atlantic, raising the temperature of Britain, and depositing moisture, which means a still further rise owing to the liberation of the latent heat. In addition, they blow the warm surface waters of the ocean from more southerly latitudes, and cause them to flow round and past our islands. There is no strongly marked current, but a general "Atlantic Drift" of the heated surface waters.

The temperature conditions of Renfrewshire are similar to those of other counties on the western slope of Scotland. The summers are cooler, and the winters are milder than on the east coast. The mean temperature for Paisley in January, taking an average over 24 years, is

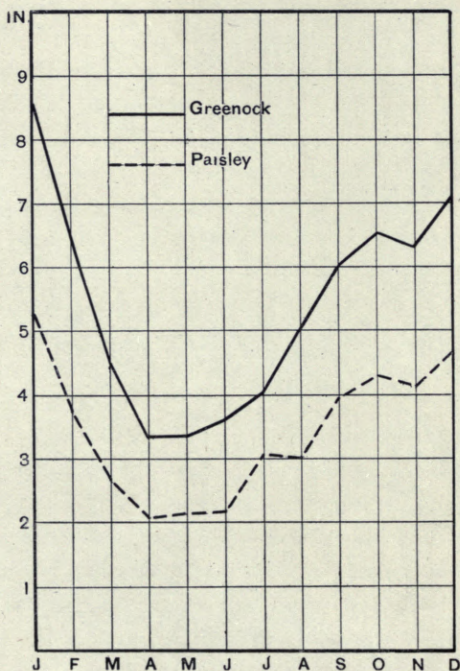
39° F., and the mean temperature for July is 59° F., giving a mean annual range of 20° F. The mean annual range for Edinburgh is 21° F., and for London is 26° F.

Renfrewshire is not so favoured in the way of sunshine as many other parts of the country. The amount of sunshine diminishes as we go from south to north or from east to west. The average number of hours of sunshine per annum at Paisley is 1201, while on Ben Nevis the amount is less than two-thirds of this figure, namely 735 hours. Aberdeen on the other hand has 1401 hours of sunshine per annum. The temperature and the sunshine are important factors in crop-raising. For example, wheat needs a hot bright summer to ripen properly, and therefore we find that Renfrew is not an important wheat-growing county. Fife is twice the size of Renfrew, but it grows more than six times the amount of wheat that Renfrew does.

The records of rainfall for Renfrewshire are neither so numerous nor so trustworthy as could be wished. Practically all the older records are unreliable. For example, the writer of the section on Renfrewshire in the *New Statistical Account* of 1845 gives the average annual rainfall of Greenock as 35 inches. More recent observations, however, taken over a period of 25 years, show an average rainfall of nearly double that amount, namely 65 inches. Either the rainfall of the county has altered to an amazing extent or the early records are untrustworthy, and the latter is the likelier explanation. In the same way it is stated that there are no fewer than three climates in the single parish of Neilston. One of them "begins at the



parting of the roads to Neilston and Irvine. No one ever came to the separation of the two roads above mentioned who did not feel immediately a sensible difference, let the weather be what it may." One must suppose that the



Rainfall throughout the year at Greenock and Paisley

reverend gentleman's meteorological sense (or his imagination) was preternaturally acute, or that the abrupt climatic change he mentions has migrated to some other corner of the road.

In Renfrewshire as a rule the driest month of the year is April, and the wettest is January. This can be clearly seen from the curves on p. 60, which show how the rainfall varies from month to month. The curves show the average rainfall for each month of the year at Paisley and Greenock. Although the total amounts for the year are quite different, yet the fluctuations from month to month show a similarity that is astonishing. Spring is much the driest season of the year, and winter is the wettest. The curves show very clearly the marked rise in the rainfall that takes place in July and August, a phenomenon that is but too well known to holiday-makers in the west. As regards length of daylight, dryness, and hours of bright sunshine, June is undoubtedly our ideal month of summer.

The following table, compiled from the annual volumes of *British Rainfall*, shows the average rainfall over the ten years 1900-1909 of several selected stations in Renfrewshire:

Station	Height above sea-level	Rainfall
Crookston	about 50 feet	37.9 inches
Paisley Observatory	107 "	44.1 "
Bishopton	195 "	46.6 "
Lochwinnoch	240 "	47.4 "
Waulk Glen	280 "	49.3 "
Gryfe Reservoir	640 "	66.3 "
Loch Thom	643 "	67.5 "

The foregoing table illustrates beautifully the effect of altitude on rainfall. The stations are arranged in



order of height above sea-level, and it is seen that without exception the rainfall increases with increasing altitude. If the averages in the above table had been taken over a much longer period it would probably have been found that in each case the rainfall was an inch or two less.