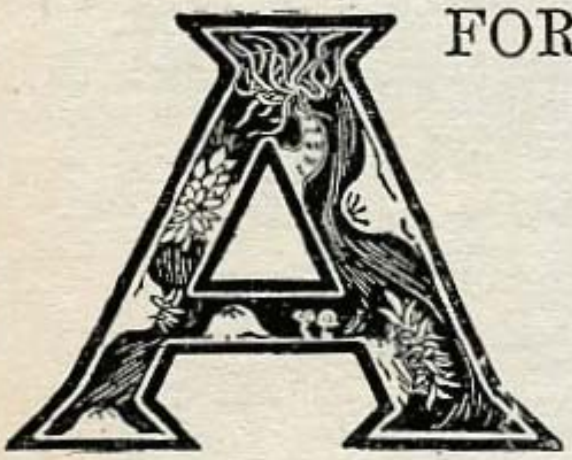
THE WEATHER OF ORKNEY.



FOREIGN writer has said that Englishmen grumble more at their weather than at anything else, while it is really the only thing about their country of which they might be proud. His meaning is that, compared with other regions of the world, the climate of Great Britain is singularly free from disagreeable extremes of heat or cold, and of drought or flood. And if this is true of Great Britain as a whole, it is especially true of Orkney. In summer we rarely suffer from heat, and in winter we are equally free from extreme cold. The mean temperature of the whole year in Orkney (45·4°) is little below that of Aberdeen (46·3°), of Alnwick in Northumberland (46·3°), or of Kew near London (49·4°).

The equability of our temperature, or its freedom from all extremes of heat and cold, is due to the influence of the sea. The temperature of the ocean varies only about 13° during the year; it is lowest in February, being 41·6°, while that of the air is 38·6°, and is highest in August, being 54·5°, while that of the air is 54°

The smallness of the difference between the annual mean temperature of Orkney and that of Kew is really due to the mildness of our winters. Taking the mean of the three winter months, we find that of Orkney to be almost the same as that of Kew, and slightly higher than that of Alnwick. For the three summer months, however, Orkney is three degrees colder than Alnwick and eight degrees colder than Kew. The hottest day in Orkney during the last thirty years only reached 76°, while at Kew 92° was recorded.

The extent to which the sea influences our climate can best be seen by comparing it with that of an inland or continental station of similar latitude Winnipeg, in the province of Manitoba, formerly well known to Orkneymen as Fort Garry in the Red River Settlement, lies in nearly the same latitude as London. Its mean temperature, however, during the three winter months is only 0·9°, or thirty-one degrees below freezing-point, and thirty-eight degrees lower than that of Orkney; in summer it is 66°, or thirteen degrees above that of Orkney.

Not only is our climate ruled by the sea; it is ruled by a sea whose waters are themselves somewhat warmer than their latitude might lead us to expect. The temperature of the ocean is often affected by currents, bringing water either from warmer or from colder regions. In the case of the ocean waters round our coasts, the movement is from the south-west. This movement is due at first to the Gulf Stream, which carries a great mass of warm water from the Gulf of Mexico into the North Atlantic, and afterwards to a surface drift caused by the prevailing south-westerly winds.

Our coast waters are therefore somewhat warmer than they would be if there were no such movement, and much warmer than if there were a current in the opposite direction, sweeping along the shores of Norway from the northern ocean. If we compare our climate with that of Nain, in Labrador, which lies in nearly the same latitude, and is also on the Atlantic coast, we shall see how much depends upon the ocean currents. The cold Arctic current which washes the Labrador coast, bringing with it melting icebergs, snow, and fog, reduces the mean annual temperature of Nain to less than 26°, more than nineteen degrees below that of Orkney.

While the climate of oceanic islands is benefited by the equable temperature of the ocean, it is often marked by excessive moisture and rainfall. Yet even in this matter we shall see that Orkney has little to complain of, while, of course, serious droughts are practically unknown.

Scotland, though small in area, shows great inequality in the distribution of its rainfall, due to the diversity of its surface and to the fact that most of its rain is brought by westerly winds. Districts near the west coast, especially if mountainous, have a much greater rainfall than those towards the east, which are also on the whole less elevated. Thus considerable portions of the West Highlands have an annual rainfall of over 80 inches, Ben Nevis recording over 150. Many parts of the eastern Lowlands, on the other hand, have only 30 inches or less; and Cromarty, which is the driest station in Scotland, has only 23 inches.

Compared with the mainland of Scotland, then, it does not seem that the climate of our islands gives us

much cause for grumbling, for our annual rainfall varies from 37·7 inches at Sandwick to 30·7 at Start Point in Sanday. Our wettest months are October, November, and December, during which we receive from one-third to one-half of our yearly rainfall; our driest months are April, May, and June, which together give us only one-eighth of the total.

One fact about rain is sometimes overlooked: in cool climates rain brings heat. This may not be noticeable at the time, but its general effect can be observed. Just as it requires heat to turn water into vapour, and as evaporation always produces cold, so the change back again from vapour into water sets free some of this heat, raising the temperature of the air, of the rain itself, and of the land on which it falls. Much of the warming effect of our westerly winds is due not to the direct warmth of the Gulf Stream, as used to be supposed, but simply to the fact that these winds are rain-carrying winds. They thus bring to us the benefit of that solar heat which far away to the south-west caused the vapour to rise from the surface of the ocean.

The chief difference between our weather and that of Scotland is, perhaps, the greater prevalence of high winds in Orkney. The land being low, our islands are swept by the full force of the gales so common in the North Atlantic. When speaking of winds, it may be useful to remember the classification which is recognized by the Meteorological Office. A wind moving at the rate of thirteen miles an hour is called a light breeze; forty miles represents the velocity of a moderate gale, and fifty-six miles a strong gale; seventy-five miles an hour is the speed of a storm, and ninety

miles that of a hurricane. We have the record of only one hurricane, on November 17, 1893, with a velocity of ninety-six miles. Several gales of over eighty miles have been experienced, and one summer gale of seventy-five miles in the year 1890. During the fifteen years 1890 to 1904 three hundred gales were recorded in Orkney, while Alnwick experienced only one hundred and fifty-seven, and Valencia, on the west coast of Ireland, one hundred and thirty for the same period. Fleetwood, on the coast of Lancashire, however, had a record of three hundred and six gales during those years.

Every Orcadian must have noticed a type of weather which is common all the year round, but especially so in winter. On a blue sky wisps of cirrus or "mare's-tail" cloud appear in patches. Gradually these increase till they form a continuous haze, in which a lunar halo or "broch," and occasionally solar halos or "sun-dogs," may be seen. Then the wind, which was light and probably westerly, backs to the southward and eastward, and the sky becomes threatening. The wind increases, perhaps to a moderate gale, and rain falls heavily. The wind then shifts towards the south and south-west, increasing in force, sometimes quite suddenly, or it may change still further round towards the north. Meantime the barometer, which has been low and falling, begins to rise briskly, and the weather clears.

To understand how this common series of weather changes comes about, a little knowledge of cyclones is necessary. A cyclone is a movement in the air resembling a whirlwind; the cyclones of the Indian Ocean and the China seas, indeed, are real whirlwinds of the most violent and destructive type. In the

North Atlantic they exist for the most part as enormous eddies in the great air-ocean, often several hundreds of miles in diameter, probably rotating with the force of a gale near the centre, and at the same time moving forward as a whole at a moderate speed. A cyclone has been known to keep company with one of our Atlantic liners during its whole voyage, but the rate of progress is often less than this.

A cyclone owes its origin to some local excess of heat, such as might arise from a heavy rainfall, the heat causing an upward movement in the air. The inrush of cool air which then follows begins a circular or whirling motion. The moist air in front of the cyclone gives up its moisture with the fall in temperature, causing the rains that are invariably found in front of such a movement. The air after the rainfall is dry and warmer, and its ascent keeps up a partial vacuum or area of low pressure, which is the centre or vent of the cyclone. It is really the rainfall in front of the cyclonic system that causes its forward movement, assisted by the rotation of the earth. Each space relieved of its moisture forms in its turn the new centre. A coast-line, or an anti-cyclonic movement of the air in front of a cyclone, will alter its course. When one reaches the shores of Europe, it soon spends itself for want of the moisture-laden winds in front to keep up the system.

In the northern hemisphere the direction of rotation of a cyclone is opposite to the movement of the hands of a watch; in the southern hemisphere it is in the same direction as the movement of the hands of a watch. This is the effect of the rotation of the earth, as will be clear after a little thought on the

matter. In the North Atlantic the forward motion of a cyclone is always from the westward to the eastward; hence the "storm warnings" which reach us from the United States.

Our islands lie in the most common track of those Atlantic cyclones, and the centre of the whirl often passes over or near the Orkneys. Now if you will look at the chart or diagram of a typical cyclone as given here, and suppose it to be moving slowly from

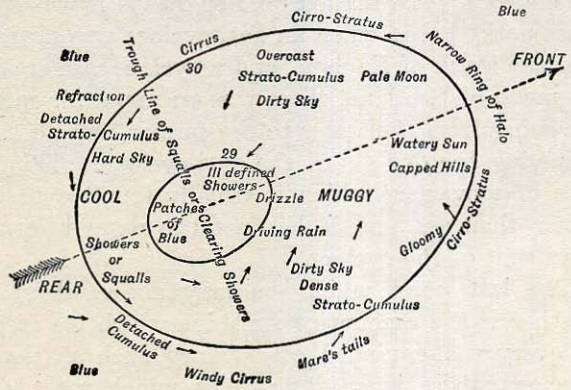


Diagram of a typical Atlantic cyclone.

south-east to north-west, or suppose yourself to be moving through it in the opposite direction while it remains still, you will see how the changes of wind and weather which we have described must result from this movement.

During the greater part of the year our weather is mainly due to a constant procession of those Atlantic cyclones, great and small, and hence arises the changeableness of our winds and our weather. But in the spring we often have weather of a differ-

ent type. Our winds are then often cold, sometimes dry, and frequently easterly or northerly in direction for several days together. Such weather is due to anti-cyclones—that is, areas of high pressure, from which the air flows downwards and spreads outwards in every direction. An anti-cyclone is the opposite of a cyclone in almost every respect. Its supply of dry air often comes from the ascending air in the centre of a cyclone, which has deposited its moisture. At the meteorological station on Ben Nevis it was sometimes noticed that when an anti-cyclone was stationed over the south of England, and a cyclone was crossing the north of Scotland, there was an upper air-current travelling from the latter to the former, and no doubt supplying the dry air of the anti-cyclone. This is a type of movement which is usually found over land rather than sea, and it has not the regular forward movement of the cyclone.

The last point which we may notice about our weather is the amount of sunshine which we receive. At every well-equipped observatory, such as that of Deerness, there is an instrument which records the duration of sunshine, hour by hour and day by day, all the year round. In the matter of sunshine, Orkney is not so badly treated as we may sometimes think. The average number of hours of sunshine each year recorded at Deerness is 1,177, while Edinburgh enjoys only 1,166. London is a little better, with 1,260, while Hastings, on the more favoured south coast of England, has an average record of 1,780 hours. Our brightest month is May, with an average of 178 hours of sunshine, and our gloomiest month is naturally December, with only 20·6 hours.