

CHANGE OF SEASONS.

The phenomena of the seasons may be divided into those which always recur every year, and those which are different in different years. We have in every year the same succession of longer and shorter days, with a summer and winter; while the summer of one year is of a higher temperature, and accompanied by finer days, than that of another. The unvarying phenomena can be explained by what we know of the sun (or earth's) motion; the varying phenomena belong to the science of meteorology, and depend upon atmospheric and other circumstances, with which we have little or no acquaintance. At any given moment the light and heat received from the sun, at any given place, depend upon the altitude of that body in two ways. In the first place, the lower the sun is, the greater the thickness of the portion of the atmosphere which its rays have to traverse before reaching the spot; the greater then is the light and heat which is lost in the passage. In the second place, the less the altitude of the sun, the less the actual quantity of light and heat which falls upon any given spot. The quantity of light and heat received when the sun is at two different altitudes, are as the signs of those altitudes. Thus the sign of 30° being $\frac{1}{2}$ and that of 90° being 1, the quantity of light which falls on a given spot when the sun is vertical, is double of that which falls when its altitude is 30° . * * *

The average temperature being nearly the same in different years, the northern side of the earth must be receiving more than it parts with during a portion of the year, and parting with more than it receives during the remainder. The summer half of the year is that half during which it gains, on the whole more than it parts with; the surplus being that which is lost during the winter half. The day in which most heat is received is the longest day; but it is notorious that the hottest weather is generally sometime after the longest day. This is easily explained as follows:—The time of greatest heat is not that at which most heat is received, but that at which the quantity of heat is the greatest, namely, just before the daily receipts of heat begin to fall short of the daily expenditure. As long as the receipt exceeds the expenditure, heat is daily added to the hemisphere, and the weather becomes hotter. The same reason may be given for the greatest cold generally following the shortest day, with a considerable interval. All these circumstances however depend much on the atmospheric circumstances of the year. The preceding explanation does not serve for the tropical climates; the days and nights are here so nearly equal throughout the year, that seasons are caused more by the effect of the winds, (which are very regular, and depend mainly on the sun's position) than by the direct action of the sun's light and heat.—The seasons are not a summer and winter, so much as recurrences of wet and dry periods, two in each year.—*Penny Cyclopaedia*.

THE SEA.

The distribution of life in the modern ocean is one of the circumstances most important to know, and yet is one not so perfectly nor so extensively investigated as it deserves. Probably to each different sort of sediment on the sea-bed, and to each different depth below the surface, as well as to every degree of shelter or exposure, and every degree of temperature, belong specific influences on animal and vegetable life.

Below some moderate depth (moderate at least as compared with the thickness of the strata) life ceases in the ocean from deficient light and air, and augmented pressure; to a few hundreds of feet perhaps some particular forms may reach; but corals which form reefs cease to live at one hundred feet, and the abundance of other orders of zoophytes, of mollusca, and crustacea, within a few feet of the surface, appears to justify the belief that the deep bottoms of the dark sea, like excessive heights in the cold air, and the centres of dry deserts, are nearly devoid of life.

The proportion which exists between the sea and land has contributed to maintain the productive powers of the earth. If that proportion was materially changed, its productive powers would be changed also. The sea by means of the vapours continually rising from its surface, supplies the atmosphere with sufficient moisture for the support of organic life. Countries which do not partake of the benefits derived from this source, and which are not refreshed by rain or dew, are uninhabitable and destitute of all vegetation. Those parts of the earth which are farthest from the sea are much less fertile and populous, than those which, owing to their greater vicinity to it, receive a larger supply of moisture from this great source. The sea contributes also considerably to the advancement of civilization. At the first view it seems to constitute an inseparable obstacle to the communications between nations who inhabit countries widely apart from one another; but the ingenuity of man has converted the ocean into the most frequented high road on the globe.—The easy communication which is thus established between nations at great distances from one another, has perhaps more than any other circumstance, contributed to improve the condition of the human race. It is at least certain, that all those nations which have acquired any considerable degree of civilization, inhabit countries either contiguous to the sea or at no great distance from it.

The whole amount of saline matter contained in sea-water fluctuates between three and four per cent. The most abundant principle of this saline matter is common salt, of which it forms about two-thirds.—It has been observed that the Southern Ocean contain more salt than the Northern Ocean.

Temperature of the air incumbent on the Northern Atlantic Ocean, is ascertained to be near ten degrees warmer than that on Southern Atlantic Ocean at 45 degrees latitude, on an average of the annual mean of both oceans, at that latitude.

It is a well established fact that places near the sea have a more uniform climate, than those which are at a great distance from it, though in the same latitude. Inland places experience a much greater degree both of heat and cold than places on the coast, and the difference between these degrees of heat and of cold increases with the distance of the place from the sea.—This phenomenon has been variously explained. The explanation is now pretty clear, since it has been proved by observation that the temperature of the air over the sea is less subject to changes than, or rather does not undergo such great changes as that of the air which is over the land. But as the temperature of countries situated between the tropics, is not subject to so great changes as that of countries in the temperate zone, and these again are less affected by them than the frigid zone, so it is found to be the case on the sea also. Beginning with the smallest natural division of time,

the day, it is found that between the tropics the difference of temperature within twenty-four hours seldom exceeds two degrees of Fahrenheit, and rarely amounts to three degrees. The difference of temperature within the temperate zone on the continents of Asia and America, sometimes amount to about 140 degrees, between the extreme heat of summer and extreme cold of winter.—*Id.*

MORPETH GAOL.

It appears from the accounts submitted to the Magistrates at the recent Quarter Sessions of the Peace, that the prisoners in Morpeth Gaol are now able to maintain themselves without any expense to the county. Mr. Cousins, the present Governor, was the first to introduce prison labour, and the profits realized thereby during the past year amounts considerably above £200.—The articles manufactured are hearthrugs and carpeting of worsted of various patterns; Indian-grass, office and passage matting, of various patterns; cocoa-nut fibre, Manila, and Indian-grass mats, of all sizes, the whole of which are sold at exceedingly moderate prices. As a proof of the great benefits derived by the prisoners themselves from the plan in operation at Morpeth, it may be stated that instances have occurred of young men being sent to prison, having served no apprenticeship, and being unable to follow any regular profession for a livelihood, and at the termination of their imprisonment the same individuals have left the prison with the means of earning, at a regular rate of wages, nearly £1 a week; so that the county, as well as the prisoners themselves, partake of the benefit of the prison labour, introduced and carried on so successfully by the present Governor.

How desirable it would be to introduce the same system of useful labour into our prisons in Canada. It is unreasonable to support and lodge at public expense, criminals that are able to work for their living.—Indeed it is rewarding instead of punishing individuals for their evil deeds. We feel convinced that obliging criminals to work while confined under sentence for their crimes, would be a very great check to the commission of crime.

ROKHARA OR CANDAHAR CLOVER.—A specimen of this plant was exhibited last August, at a meeting of the Yorkshire Agricultural Society, by Mr. Stickney, who states, "that if allowed to flower, it becomes biennial; and that a single plant in rich soil, kept clean of weeds, will cover a circle of two yards in diameter, and attain the height of fifteen feet. It dies down in the autumn, but in the spring shoots out again from the crown. Horses and all kinds of cattle eat it freely, either in a green or dried state.—It may perhaps prove useful in alternate husbandry; as it produces a great weight of herbage; and has at the second cutting in September, attained the height of two feet.—*M. L. Express*.

PUNCTUALITY.—If you desire to enjoy life, avoid unpunctual people. They impede business and poison pleasure. Make it your own rule not only to be punctual, but a little before hand. Such a habit insures composure which is essential to happiness. For want of it many people live in a constant fever, and put all about them in a fever too.