not more than one area in which the rainfall exceeded half an inch. The average distance of the principal rain centres from the centre of low pressure was about 400 miles.

The occurrence of tornadoes in the United States is a matter of importance on account of their frequency and their destructiveness, and much has been published in regard to them. *A* large amount of information will be found in a publication of the Signal Service, prepared by Mr J. P. Finley, and issued in 1882. These storms are not limited to any one month or season ; but they are most frequent in summer, especially in the months of June, April, July, and May, and least so in the months of December and January. Of 600 tabulated by Mr Finley, occurring from 1794 to 1881, 112 were in June, 97 in April, 90 in July, 81 in May, and only 9 in December and 7 in January. They are most frequent in the after­noon, between noon and six o’clock; the hour in which the greatest number occurred was that from 5 to 6 p. μ. The course of more than half of the 600 (310) was from south-west to north-east, and only 38 moved in the opposite direction. Only 46 had a course directed from the eastern side of the meridian towards the western. The width of the path of destruction varied from 40 to 10,000 feet, the average being 1085 feet. The velocity of progression of the storm-cloud, in 130 cases in which this item is given, varied from 12 to 60 miles per hour, the average being 30 miles. The time consumed by the tornado in passing any given point varied from 10 seconds to 30 minutes, the average of 50 occurrences being 6∙52 minutes. The velocity of the wind within the cloud vortex was variously estimated at from 70 to 800 miles an hour. The whirling motion of the cloud was invariably from right to left. Of 600 tornadoes investigated, 134 were reported as being “unusually de­structive.” Of these 64 occurred within the States of Kansas, Illinois, Iowa, and Missouri, and this region, lying adjacent to the Mississippi river, seems to be that in which the conditions are most favourable to the development of these phenomena. There are also two areas—one in Georgia and one in New York—where tornadoes are more frequent than they are elsewhere in the eastern States. Of the destructiveness of these tornadoes some idea may be formed from the statement that in many of them buildings and everything else projecting from the surface are levelled to the ground, frag­ments of the materials thus uptorn being carried often to great distances. In the tornado of April 18, 1880, the effects of which were felt along a path more than a hundred miles in length through Illinois and Missouri, in one town over which it passed, 65 persons were killed, over 200 wounded, and more than 200 buildings were demolished. The loss of property in two counties of Missouri was over a million dollars.

The series of destructive storms which took place on the 19th of February 1884 is probably the most remarkable occurrence of this kind which has taken place in the United States since the country was settled by the whites. The loss of property was not less than $3,000,000 to $4,000,000, while 800 persons lost their lives, and about 2500 were wounded. From 10,000 to 15,000 were rendered homeless, as many as 10,000 buildings having been destroyed. Great quantities of live stock also perished. A central area of barometric depression moved between 7 A. Μ. of the 18th and 7 A. Μ. of the 19th from Fort Keogh to the vicinity of Chicago ; at the same hour on the 20th it was about 150 miles north-west of Montreal. On the 19th, at 7 A.Μ., another extremely elongated area of barometric depression had been formed, extend­ing almost north and south across the whole United States, and having its centre near Davenport, Iowa. Towards this centre the winds blew from north and south, the isotherms indicating very great contrasts of temperature between the areas of northerly and southerly winds, this condition of things being an invariable precursor of tornado development. The two centres of barometric disturbance were, as is commonly the case in occurrences of this kind, widely separated. At 3 p.m. of the 19th the centre of the north and south trending barometric depression was near Indian­apolis, the contrasts of temperature remaining extreme, and violent winds developing themselves at various points south of Indianapolis, especially along the Ohio river from Cairo to Louisville, in the vicinity of Nashville, and in northern Alabama. At 11 P.M. of the same day the barometric trough had diminished somewhat in intensity, and the entire area of disturbance was passing rapidly off to the north-eastward. Between 3 p.m. and sundown the area devastated was chiefly in eastern Alabama and northern Georgia. Before 11 p.m. the destructive storms in North and South Carolina had reached their maximum violence ; those in southern Virginia were most destructive about midnight. The Signal Service charts for the day indicate about thirty distinct areas of violent tornadoes, most of them between the eastern border of Alabama and the southern boundary of Virginia.

Vegetation.

No portion of the United States attains so high a latitude that the forest growth should be necessarily dwarfed by the cold, or dis­appear altogether. The northern boundary is, however, practic­ally nearly the limit beyond which valuable timber cannot be expected. The portions of the United States where altitude is fatal to the growth of forest vegetation are insignificant as com­pared with the area of the whole country. The Appalachian ranges—which originally were densely forested from extreme north­east to extreme south-west, and which still continue to be so over a considerable portion of their extent—only rise at a very few points high enough to cause the forests to disappear. This is the case particularly with Mount Washington and the higher adjacent peaks, and with the summits of the most elevated part of the system in North Carolina. The Adirondacks are densely wooded, even almost to the highest summits. In the most elevated mountain-chains making up the Cordilleran system, want of moisture appears to co-operate with elevation in thinning out the forests on their flanks and causing them to disappear entirely on the highest ranges. The timber line on the most elevated peaks of Colorado reaches from 11,000 to about 11,500 feet,—the summits themselves rising from 2000 to 3000 feet higher. The Sierra Nevada is bare of forests in its highest portions. The high region about Mount Whitney is, where not snow-covered, nothing but an entirely bare mass of granite domes and needles. In the central part of the Sierra, in the vicinity of the Yosemite valley, forest vegetation is extremely scanty above 9000 feet, and the upper 3000 feet of the highest peaks is entirely bare of trees. If large areas of the United States are destitute of trees, and other regions but very poorly supplied, the chief cause of this is want of sufficient moisture.

In briefly indicating the nature and distribution of the forests of the United States, we may begin with the Appalachian region, which here must be taken as embracing also the country to the west and south-west, including the valleys of the Mississippi and Missouri, as far west as the western boundary of the State of Missouri, or about the 95th meridian, to the east of which lies, coincident with the region of generally abundant and every­where sufficient rainfall, that portion of the United States which is almost everywhere densely forested, and the only portion which is so, with the exception of a comparatively narrow strip on the Pacific coast. Included within this densely-forested region of the Appalachian system and Mississippi valley there is quite a large area destitute of continuous forests,—the so-called “ prairie region ” (see below). The portion of the United States first settled by Europeans was, almost without exception, a densely-forested region, over which the aboriginal inhabitants roamed, without having interfered to any perceptible extent with the natural forest growth of the country. Their numbers were small, and their habitations were, almost without exception, either on or near the shores of the ocean and its bays and indentations, or along the river bottoms, in such places as were naturally grassed and not forested. This densely-forested region extends throughout the whole length of the Atlantic coast from Maine to Florida, west through the region of the Great Lakes to beyond Lake Superior, and to the south-west through Louisiana and for some distance into Texas. It differs from the densely-forested region of the Pacific in that it is essenti­ally a region of deciduous or hardwood forests, while the latter is essentially one of coniferous trees ; it differs from the forested region of the Rocky Mountains in that the latter is not only essentially a region of coniferous trees, but one where the forests do not by any means occupy all the area, neither do they approach in density or economic importance those of the eastern division of the country. Again, the forests of the east embrace a great variety of species, which, as a rule, are very much intermingled, and do not, unless quite exceptionally, occupy areas chiefly devoted to one species ; while, on the other hand, the forests of the west— including both Rocky Mountain and Pacific coast divisions— exhibit a small number of species, considering the vast area em­braced in the region; and these species are, in quite a number of instances, extraordinarily limited in their range, although there are cases in which one or two species have almost exclusive posses­sion of very extensive regions. The eastern forested region, while continuous from north-east to south, south-west, and west, is of course marked by changes in the species corresponding with the changes in temperature between the extreme north-east and the extreme south. These changes, however, are almost without exception gradually made, and we pass almost imperceptibly from a northern to a southern forest. This condition is, in a measure, the consequence of the breadth and high elevation of the Appa­lachian system in its southern extension, along which elevated belt the northern aspect of the arboreal vegetation is prolonged into a region almost semi-tropical.

The following hardwood trees may be mentioned as being the most prominent and important in the forests of the eastern division of the country. The sugar-maple *(Acer saccharinum),* called also the hard and rock maple, ranges as far south as northern Alabama, but is of the most economical importance in New England and the region of the Great Lakes. On the southern shore of Lake Superior, in the higher portions of the country, on and near the divide between the waters flowing into the lake and those which descend to the Mississippi, the forest, over large areas, is almost exclusively