

Always the SAME

Always GOOD

YEAR WITHOUT A SUMMER.

Interesting Chronicles of Abnormal Weather Conditions.

Herbert J. Browne in Dearborn Independent.

Crop failures may come from any unseasonable climatic cause. Nature's balance may be upset from several directions. What has happened in the past is apt to happen again.

In the bed of the Ohio river below Pittsburg is a rock exposed only at extremely low stages of the river and said to have been even partly uncovered only twice since white men have occupied the country. It carries the strange markings of some primitive pre-Columbian people and is believed to be their record of the river's fall during an extreme drought. The Indians of the Mississippi Valley had traditions of a drought and famine so severe that there was no grass for the deer or buffalo, which died of starvation; even bird life disappeared, the Indians themselves surviving by living on fish from the depleted streams and the lakes.

A later and more definitely recorded year of calamity was 1816, "The Year Without a Summer." Various records have been preserved of this extraordinary period. Not only was it a year of sunspot maxima, but the year before Tombaro, in the island of Sumbawa, Dutch East Indies, blew up in one of the greatest volcanic explosions of modern times, filling the upper atmosphere with hundreds of cubic miles of fine volcanic dust, which in a few months spread all over the earth, lasting for three years, and in conjunction with the disturbance of the sunspot maxima intercepted enough of the sun's heat to account for the cold weather of this year 1816. No crops were raised even in Virginia. Potatoes, beans, wheat, rye and corn hardly got above the ground. There was no hay or pasturage, and farmers sold their livestock for a few dollars a head to the more fortunate ones who had carried over from the previous year a supply of hay and grain. Ice formed and snow fell every month in the year. While the East was well settled, the trans-Appalachian country was receiving its first strong impulse of hardy pioneers. Detroit was a small village and military post, St. Louis a French fur-trading settlement and Chicago still Fort Dearborn. The abnormal cold extended to the British Isles, Europe and even into North Africa. It may here be noted that 1762, 1816 and 1870, three seriously abnormal years, fit into the 55.6 cycle of highest maxima of sunspots, that the dry year 1881 recorded nearly as many sunspots as the 11.11 year cycle of 1883, and that the next 55.6 year major cycle will fall in 1926-27.

The most interesting record of 1816 is that of Charles Pierce, of Philadelphia, from which the following is taken.

April—Mean temperature 47. Cold, piercing snow storms; ice several nights. All buds and green things killed.

May—Mean temperature 57. A frosty June, her frowns many, her smiles few. Cold frosty nights, north winds. Buds and small fruit frozen, 1/4 to 1/2 inch. Corn replanted three times.

June—Average temperature 64. Coldest ever remembered. Severe frosts and one day ice. All restarted plants killed.

Six to ten inches snow in Vermont, three inches in New York, several inches in Maine and New Hampshire.

July—Mean temperature 68. Frost and thin ice 5th. Ice as thick as window glass in New York, New England and Pennsylvania. Grass destroyed. Very little rain.

August—Cheerless and cold. North-east rains. Ice 1/2 inch thick. Indian corn frozen. Newspapers from England say: "It will be remembered by the present generation that the year 1816 was a year in which there was no summer."

September—Cold mild. Mean temperature 62. Frosty 17th. Severe equinoctial storm, 23d. Then several days of freezing weather.

October—Mean temperature 41. Cold, freezing a few warm days.

November—Mean temperature 41.

Cold. Froze hard several nights.

December—Mean temperature 32. Milder.

Pierce records that December, 1815, saw more intensely cold weather than any December in 25 years, and that 1816 was also of exceptional severity in Europe, North Africa and the West Indies. Seed corn held over from 1815 sold for \$4 a bushel on the cob in the spring of 1817. He also notes that the year 1762 had the severest drought on record in Pennsylvania, that scarcely a drop of rain fell from May to September and that there were no crops.

The extraordinary cold year of 1816 was a repetition of many such recorded since the beginning of the Christian Era. In 201 the Black Sea was frozen over, and in 401 not only the Black Sea but the Bosphorus, the Dardanelles and the Sea of Marmora, and again in 762. In 1384 the Adriatic froze. History records a startling number of weather catastrophes, the recurrence of which now, with population pressing more and more closely upon the heels of production, would menace the welfare of humanity. They have come oftener than once a century, but it has been less than a hundred years since food supplies have been brought thousands of miles to the populous trading and manufacturing nations. And it is a singular paradox that so far famines have affected principally the agricultural populations of the regions where the droughts have fallen. It could not fail to fall heavily on the non-producing centers if it were to occur again in the near future.

Less attention has been given by meteorologists to the causes of cold years, because their recurrence within the short period of modern scientific meteorological investigations has not been notable. But in the combination of unfavorable conditions will lie the explanation. Assume for two or three years dry summers and autumns in the lower temperate regions, with unusually heavy snow falls in the high northern latitudes and normally cold arctic winters. The stage would then be set for cold late springs and a limited movement of the arctic ice fields. That in turn would develop arctic abnormal highs and abnormal Atlantic and Pacific lows. This would have the double effect of bringing up from the ocean depths beneath the subtropical lows huge bodies of icy water and of causing numerous arctic anti-cyclones to sweep south all through the spring and summer in a series of cold waves. It does not require constant cold to kill crops, but a series of killing frosts and freezes.

Conditions in the polar ice cap determines largely the location of the Aleutian low. Let a warm winter be followed by a warm spring with the ice fields clearing into the Atlantic at an early date, the Aleutian low will move well to the north and weaken until it is practically blended with the general field of rising arctic pressure. The Icelandic low will follow suit, and then both Atlantic and Pacific highs will be found moving north of their normal stations.

In the United States warm currents will flow in and move far toward the arctic and what cyclonic lows find their way into the American continent are too feeble to work south of the Great Lakes and produce rain. A great stagnant high pressure area will have taken possession of the country and a severe drought is on. The dry winds crossing the Rockies now sweep across the heated plains and burn the withering crops like a prairie fire.

The country has suffered from numerous dry periods, each originating in certain of the causes here outlined. Let these causes all be combined in a single assault, and the country would experience a drought of unprecedented severity.

The drought of 1881 was of wide extent. Abnormal conditions had appeared during the previous two years. December 1880 was one of the warmest Decembers ever recorded, and January 1881 the warmest east of the Rockies. The Canadian snow cover was thin and soon melted, confirmation of the theory that its early departure is a contributing cause of droughts in the states. During May the cool lows, whose normal progress well south of the Great Lakes gives the saving rains, were drifting east above latitude 45, and the inevitable deficiency in rainfall which had begun in April continued until late September.

The entire country east of the Mississippi was under the spell, and during July and August Kansas and Arkansas were affected. In August, the Middle Atlantic states received less than one-third their normal rainfall, and the Ohio valley less than one-eighth. By September the situation north of the Ohio and east of the Mississippi clear to the coast had become hopeless. Streets had fallen to their lowest stages and the crops were either killed or so badly injured as to not pay for the harvesting. A severe drought in July and August, 1876, extended from Maine to Virginia and west into Ohio with a rainfall of less

than an inch. In 1886 the drought was marked in northeast Dakota and northwest Minnesota. During June and July the dry area included five other states with extensive crop damage.

The year 1920 saw the southwestern cattle ranges so stricken that the government had to intervene to aid in getting the cattle almost bodily out of the territory. The northwest grain belt fared nearly as badly.

Both 1920 and 1921 saw large areas of intense drought, and the later year witnessed the failure of the Russian grain crop and the most destructive famine in the history of that country.

In the period from September, 1920, to July, 1921, inclusive, a light northern snow cover and early high arctic temperatures paved the way for droughts. The country filled with stagnant high areas and the arctic cyclones were too weak to dislodge them. The lows were nearly 44 per cent above the average number, but this was the mark of a warm arctic whose signpost, the Aleutian low, was far north of its proper place, or Atlantic and Pacific highs moved to the north, and sluggish atmospheric conditions generally.

The year 1922 just closed is the third in succession of striking abnormalities and world-wide weather disturbances. The Russian drought of 1921 and a serious famine in China are included, with every country in Europe suffering severely during the past five years. Since the record of 1922 will have a strong bearing on what may happen during 1923, its record should be examined with care. Its first abnormality was the record-breaking snowstorm which swept up the south and middle Atlantic states January 27-29. Richmond had 19 inches of snow, Washington 28, Baltimore 26, Wilmington, Delaware 18, Philadelphia 12, and points, farther north and east, lessening amounts. This storm finds repetition a year later in the great gale which swept the whole length of the Atlantic coast the last week in December 1922, crossed the ocean with increasing intensity, and ravaged the coasts of western Europe, reported by many sea captains as the worst they had ever experienced.

Following the January 1922, snow came a series of winter thunderstorms ranging east from Milwaukee to New York and south to Washington. A severe glaze storm followed in the Great Lakes region doing \$5,000,000 damage in Michigan and \$10,000,000 in Wisconsin. In March came the great cold wave which swept the citrus belt from California to Florida, with freezing temperatures as far south as Corpus Christi, Texas, the first time on record. A cold wave in May damaged fruit from New York to Virginia. The

Gulf states saw the cotton crop seriously damaged by excessive rains all through the spring and early summer and numerous cloudbursts were reported in many sections. Droughts are characterized by vagaries of intense local rains, or more frequently by excessive rains during the fortnight preceding the beginning of the period.

Drought sections of great intensity developed in northern Pennsylvania extending north into New York. Similar conditions were reported in the Kentucky coal fields. The rainfall of the great grain states of the trans-Mississippi has been far below normal and forecasts indicate that any further unfavorable developments will find the winter wheat plants too weak to make resistance. Severe droughts prevailed in the Great Plains and Rocky Mountain districts and Pacific slope and the rainfall of nine-tenths of the country is distinctly below normal.

Now comes an interesting report from the American consul at Bergen, Norway, issued by the department of commerce at Washington. He states that the Arctic ocean has become much warmer this winter. Seals are retiring far north to the ice fields much beyond their usual grounds. Ice fields are disappearing, glaciers are melting in Greenland, leaving bare ravines and moraines never seen before. The whitefish have vanished and herring and smelt have gone north to take their places. Dr. Hoel, geologist of the University of Norway, has just returned from an Arctic expedition and reports that he found very little ice and that his soundings to a depth of more than two miles showed the north arm of the Gulf stream very warm as far up as 81 degrees 21 minutes, nearly 14-degrees inside the arctic circle. An arctic fisherman, he states, says that it has been growing warmer in the arctic since 1918.

Here has been set forth the record of three consecutive years of drought, high temperatures and marked abnormalities of rainfall, cold waves, heat and barometric disturbances. The year just closed has been the most marked of the series in its chaotic conditions, particularly in those which carry over their effects into the following year.

The Order of Railway Expressman has filed a formal request with the United States railroad labor board for an increase of ten cents per hour wage increase. The request affects 70,000 expressmen and the increase would cost slightly more than \$17,000,000 per annum.

Allendale, the baby county, which formerly grew only cotton to sell, is showing what can be done in diversified farming, her farmers having shipped out in three months 60 cars of hogs, 15 cars of cattle and over \$3,000 worth of poultry.

Stonemasons and their helpers of New York City are threatening to go on strike for higher wages. They are now receiving \$9 and \$6 per day respectively. They demand an increase of \$11 and \$8 per day.

A forest fire, four miles wide, swept over a good many thousands of acres of farm and timber land in New Jersey, Tuesday. The fire is thought to have been started by locomotive sparks.



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