

METEOROLOGY

Midwest Prairies Linked With Hot Sahara Desert

Persistent High Pressure Area Spreads Clear Across Atlantic and Makes Cooling Storms Detour to North

SCORCHING heat over the entire West, from the Mississippi to the Rockies and from the Canadian border almost to the Gulf, can be blamed on a pile-up of high barometric pressure over the North Atlantic Ocean, which hangs on persistently, and shunts possible cooling storms far toward the north, to spend their treasures in Canada.

The outlying edge of this barometric barricade cuts across the Southeastern states, and is immediately responsible for the sufferings of citizens and renewed peril to crops. But the whole high-pressure area spreads clear across the ocean, and links the sweltering prairies with the mirage-shimmering sands of the Sahara, in Africa, for the same lines of barometric pressure that lie across Kansas and Iowa, run also through the world's greatest desert.

This feature of late July's record-breaking heat and its causes was explained by Charles D. Reed, senior meteorologist of the U. S. Weather Bureau office in Des Moines.

The same persistent heated area, devoid of any storm-bringing "lows," was also responsible for the long delay in the U. S. Army-National Geographic stratosphere balloon flight, Mr. Reed added. The normal procession of "highs" from the Pacific coast or Canada was interrupted, and until one of these moved across the bowl in the right relationship, the balloon could not be launched safely. Furthermore, the sudden rising of small local "blubs" of hot air might cause spotty thunderstorms, which would make the flight of the enormous fragile bag of hydrogen altogether too risky.

Clockwise Circulation

Returning to the causes of the heat, Mr. Reed said: "The wind circulation around any area of high barometer in the northern hemisphere is clockwise, that is, the wind circulates around the center in the direction of motion of the hands of your watch. Hence the wind circulation over the Mississippi

and Missouri valleys on the border of a great high pressure center such as I have described is from some southerly direction with great persistence.

"Moreover, this large high pressure area affords stubborn resistance to the areas of low barometer commonly known as storm centers which in their normal course move from west to east across the United States. Striking this high pressure barrier, the low pressure centers either disintegrate or are shunted far northward into Canada.

"Normally as these centers of low pressure pass eastward there are intervals of northwesterly winds bringing the cooler temperatures of the northern latitudes into the Midwest, but when these low-pressure areas are thus broken up or deflected, there is no respite from the southerly winds and scorching sunshine, and there is a cumulative effect of heat from day to day that sends the thermometer higher and higher.

"Finally, some force not fully understood by meteorologists breaks up the great high-pressure center over the Atlantic and restores the normal eastward procession of low-pressure centers across the Midwest."

Hot August Expected

A hot August may be expected to follow hot July in the central part of the United States, if temperature correlations observed by Mr. Reed hold for this year as they have in the past. July mean temperatures for Iowa this year have averaged about eight degrees higher than normal July means; and Mr. Reed's statistics indicate that when the excess is only three degrees the chances of a hot August following a hot July are about 100 per cent.

The conditions for Iowa are paralleled fairly closely by conditions throughout the West and Midwest; so that sweltering humanity and suffering crops and livestock do not have a particularly consoling prospect for late-summer comfort.

There is also a strong probability that rainfall will be deficient in August, for

Mr. Reed's statistical studies disclose a correlation between July heat and August drought in past years. This correlation, however, is not quite so strong as that between above-normal temperatures in the two months.

Danger to the corn crop has been allayed considerably by numerous timely local rains, so that the prospects for a droughty August are not as alarming as they might otherwise be, except in southern Iowa where the corn is already given up for lost.

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CLIMATOLOGY

If America Becomes Desert It Will Not Be In Our Time

PERSISTENT drought and abnormal heat, returning annually for several summers, have again raised the question whether America is being turned into a desert. There is a shuddery thrill in such speculations which some people seem to enjoy a great deal.

It is not likely that camels will be substituted for cows in Nebraska in anything like our own time; and all the shieks one is likely to see in Ohio will continue to be of the corner drugstore variety. Sweeping long-time changes in climate have occurred, but they have always been measurable in terms of millennia rather than of mere decades.

There was, apparently, a persistent warm period in Europe during the earlier Middle Ages. It had enough effect to make the colonization of Iceland and Greenland possible. When colder winters returned, about the fourteenth century by the best available records and conjectures, the Greenland colonies were quite literally frozen out, and the hopeful infant settlement in Vinland, on the North American mainland, perished.

In the interior of the North American continent, also, there seems to have been a longer period of drier, warmer climate than that which we now regard as normal. Whether or not this coincided with the Viking settlement period is not known. But evidence for its existence has been interpreted by Prof. Paul B. Sears of the University of Oklahoma, on the basis of pollen deposits he has found in bogs in the Ohio Valley and elsewhere.

During this dry-warm period, Prof. Sears has suggested, the Corn Belt, then an affair of Indian cultivation, may have migrated eastward, following the retreating forests. At its close, when cooler-moister climate made high tree

growth in the Ohio valley again possible, the cultivation of corn, and the particular Indian culture-type dependent on it, would have to return to the prairies.

There is some support for Prof. Sears' suggestion in the distribution of the great mounds and other culture remains of the prehistoric Indian people now known as the Hopewell type, from the Ohio site first explored for their remains. First known at this, its easternmost extension, Hopewell culture has been traced in northern Illinois and eastern Iowa.

CHEMISTRY

Experiment With Chemical For Dissipation of Fog

WHEN Massachusetts Institute of Technology scientists sprayed fog away experimentally by means of a chemical shower, it was the latest of many experiments aimed at conquering fog.

The problem of fog dissipation has become more important with the increasing use of airplanes. Flying is impossible or dangerous when fog covers landing fields. But even before air transportation became important, scientists were fighting fog.

As yet Henry G. Houghton, Jr., who conducted the M. I. T. fog spraying tests at Round Hill, Mass., has not told the compositions of the chemical solution sprayed as a curtain of tiny drops to drive the fog away from a limited volume of space.

The trick of the spray is to condense the water vapor making up the fog and make it fall to the ground as fine rain. Such a scheme will be effective for a very limited area.

The system may prove to be useful at a busy airport, to which the airplane pilot could be guided by radio beacons.

Electrical precipitation, which has proved effective in treating industrial dusts, smokes and fumes, was tried on fog in England and California many years ago. American and British air forces have tried sprinkling various water-attracting dusts in the air, and electrified sand has also been used. The U. S. Navy at Philadelphia built elaborate machines for spraying electrified water drops into foggy air to cause the

If subsequent work of American archaeologists demonstrates that the western extension of this ancient Indian civilization was not contemporaneous with the eastern, but either preceded or followed it—or both preceded and followed it—it will at least establish the fact of an advance and a recession in a culture-tide. Then it will be up to the paleoclimatologists and the paleobotanists to seek evidence for or against correlated advance and recession in the climate, and in the vegetation types dependent on it.

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fog particles to come together and fall. And at Lyon in France and Pittsburgh, Pa., oil was placed on rivers in the hope of checking evaporation and preventing the formation of troublesome fogs.

Some of these attempts were partially successful on a small scale but as yet no fog dissipating process has been practical. Attempted rain production is often a variation of fog dissipating processes.

Radio landing beacons combined with airways radio beacons, as developed by the U. S. National Bureau of Standards, are the most successful means of combatting fog, not by removing it, but by allowing the pilot to find his way through it to successful blind landings.

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TO DRIVE AWAY FOG

Apparatus being tested at the Massachusetts Institute of Technology to determine its possibilities as a dissipator of fog. The pipes and nozzles composing the system are shown here before they were elevated to their working height of 30 feet above the ground. The chemical sprayed by this device will condense and precipitate the water vapor, clearing fog from the airport on which it is installed, it is hoped.

MEDICINE

Swine May Be Reservoir For Fatal Pseudorabies

SWINE may be the reservoir for pseudorabies, an acute, highly fatal disease of cattle, cats and dogs, Dr. Richard E. Shope has found from investigations made at the Rockefeller Institute for Medical Research.

The disease of cattle is caused by a virus. It can be given to rats, rabbits, guinea pigs and other animals by injecting the virus into the animal, but how it spreads naturally has been something of a mystery.

Following the discovery of a European investigator, S. Von Ratz, that pseudorabies occurs naturally in wild swine, Dr. Shope began studying the disease in relation to domestic swine, he explained in his report to the current issue of *Science*.

Injecting the virus under the skin of these animals or swabbing it inside their noses produces the disease. But, unlike cattle, swine have a very mild form of pseudorabies and do not die of it. Dr. Shope suggests, therefore, that the disease is naturally transferred from one animal to another via the nasal route. The swine have the disease in such a mild form that the farmer may not recognize it or even may not know that any of his swine are sick.

Yet from this reservoir in the swine the disease may be transferred to the cattle. In Dr. Shope's opinion this explains the sporadic and highly fatal cases of pseudorabies that occur among cattle in the swine-raising states of the Middle West.

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