SCIENCE NEWS

Science Service, Washington, D. C.

THE DISTRIBUTION OF RAIN

AMERICA is not alone in suffering abnormal weather conditions, according to information reaching the U. S. Weather Bureau. In central, south and western Europe drought has threatened the wheat crop, which has been especially hit in Italy. The condition in France is also bad, in Germany it is not so bad, while in England the crops have not yet been affected. Rain has come in England, so that the conditions there will probably be relieved.

In Japan and along the coast of China it has been very wet in recent weeks, with many typhoons. In South America, where the seasons are reversed and it is now the middle of winter, the weather has been unusually cold. Reports from Australia, also now in winter, indicate that the Australian wheat crop is unusually good.

With such abnormal conditions in the United States they are to be expected elsewhere, though not of the same kind, according to Dr. C. L. Mitchell, of the Weather Bureau.

"When it is excessively dry here, it will be excessively wet elsewhere, and when we have unusually hot weather other parts of the world will be unusually cold. In other words, the average over the world stays pretty much the same. Lately there have been a good many rains at sea, and a rain at sea is really a most useless thing!"

There have also been rains lately in the region east of Hudson Bay. This is the center of the main disturbance of eastern North America, and other disturbed regions, or low-pressure areas, have been merely satellites of this large low in Labrador. This condition permits the warm air from the Gulf of Mexico to pass unhindered in a northeasterly direction across the country. A large low over the Middle West with a high to the north of it would produce the conditions needed for rain, he said, as there is moisture in the atmosphere, and it is only necessary to precipitate it. But there are no artificial means of making this happen. Just what has caused this distribution of pressure areas Dr. Mitchell could not say.

Only the drought and hot spell of 1901 can compare with the present one. But that was confined to July, and was over by this time of the year, and this one is still continuing. Certain parts of the country were harder hit in that year than they have been so far this year, but as the present drought threatens to continue for some time it is quite likely that this will prove far worse.

EFFECTS OF THE DROUGHT

THE latest information obtained at the U. S. Department of Agriculture indicates that no danger of actual food shortage is foreseen in the extreme drought affecting crops in wide areas of the United States.

Luckily the major portion of the wheat crop was safely harvested before the effects of the continued heat had begun to tell and this means, at least, an abundance of flour for bread.

The possibility of a potato shortage still looms but is not yet serious. Meat, on the other hand, promises to be cheap. In fact, the fear is that it may be disastrously so for the farmer, as pasture lands are suffering and the prospects for a normal corn crop lessen with each additional dry day.

Two more weeks of drought would mean that thousands of farmers will be forced to kill their stock this winter because they will not have enough feed to last them through until the next crop. Such a forced marketing of stock would have the effect of lowering meat prices and involve serious losses to stock raisers throughout the country. Supplies of wheat already harvested and the additional spring crop that will be garnered from the northern states, if the drought there is not too prolonged, should partially compensate for the corn crop shortage, however.

With the stock-raising industry the worst hit by the drought, a milk shortage might be expected, but thus far the surplus supply of dairy products has sufficed and stood the dairymen in good stead in preventing a price slump. Luckily the dairy communities of Minnesota, Wisconsin and northern Iowa have not been among the worst hit, although this season of the year is normally one of reduced milk production.

Regions bordering around the Ohio-Mississippi river system from Pittsburgh to the Gulf and Montana and adjacent portions of North Dakota are those most affected by the heat wave and three quarters of the average crop yield is the best that can be hoped for from these sections. There is still the possibility of crops above the average from New York, the New England States, and North and South Carolina, while portions of Wisconsin, Iowa, South Dakota and Nebraska may still be above par. But surrounding the area of extreme drought on the borders of the Ohio and Mississippi, there is a large section which will yield slightly less than average crops, probably about four fifths the normal yield.

The picture painted for the whole country is not so black, then, as might be expected, though certainly it does not look bright for many communities. This reckoning is based only on the present crop indications, however, without a calculation of the dire chances involved in continued and wide-spread drought. If there is no relief from the heat, the present picture is too optimistic.

Chances of a hot dry August following a hot dry July are only one in eight, however, judging from the records of past years. While offering this reassurance for what it is worth, the statisticians of the U. S. Bureau of Agriculture left the duty of prophecy to the Weather Bureau, which to date offers no promise of relief.

PATENTS FOR RAIN-MAKING DEVICES

IF you could make rain in any desired amount to order, you would undoubtedly become, to-day, the most

famous person in the world, besides earning a fabulous fortune. The present severe drought has brought its usual crop of professional rain makers seeking to swindle the credulous farmer, who in his present desperate straits is willing to take a chance on almost anything that may bring relief to his sun-baked, withering crops. No method has yet been devised which will produce rain in a sufficient quantity to make it practicable during a severe drought such as we are now having, but unfortunately not all farmers know this.

The professional rain maker is a shrewd salesman who knows how to play on the credulity of human nature. He may, for example, enter into a contract with a farmer promising him rain in a week or ten days for which he is to receive five thousand dollars. The rain maker will then set up some formidable looking apparatus which discharges electric sparks or chemicals in the air. He may explode shells containing gunpowder or nitroglycerine. Under ordinary circumstances rain is bound to come sooner or later, and the rain maker can very well gamble on this chance, for he has nothing to lose. As soon as rain comes he credits the performance to himself and, of course, demands the sum specified in his contract.

Rain makers have been careful to protect their methods and devices by obtaining patents from the government. Daniel Ruggles obtained a patent in 1880 for making rain by sending up one or more balloons carrying explosive cartridges and torpedoes which are detonated by an electric wire trailing on the ground. His theory is that the explosion produces a concussive force which condenses the moisture in the air, thus producing rain. There is actually no scientific basis in this theory. During the war immense quantities of explosives were detonated, but no appreciable quantity of rain was caused by those explosions.

Another patent issued in 1891 to Louis Gathmann first forms rain clouds by spraying liquid carbon dioxide gas high up in the air. The evaporation of the carbon dioxide cools the air, condensing the moisture it contains, forming a cloud and finally rain. This method appears plausible at first, but in order to cool large quantities of air so as to produce any appreciable condensation of moisture, extremely large quantities of liquid carbon dioxide would have to be used, the cost of which would be prohibitive. The rain thus produced would not save enough crops to pay for the expense involved.

Several patents have also been granted for balloons equipped with sharp metallic points in order to discharge electricity in the air. John Potts, for instance, obtained a patent in 1913 for a balloon having many sharp spurs on its surface. These points are attached to a wire which is grounded. Another patent, granted in 1918, uses a similar device. The inventor explains his theory in the following language:

"The atmosphere is known to contain transient zones of electrified air, and it is also known that aqueous particles constituting clouds are invariably charged with electricity and that the potential distribution throughout such atmospheric zones and clouds is usually uneven. It is also known that the sign and the potential gradient of regions of the atmosphere are varied or altered by these charged zones of clouds. I have discovered that if the potential gradient between earth and such atmospheric zones and clouds is diminished or canceled, particularly at times preceding rainfall, or at times when rain is falling, rainfall is procured or stimulated." Unfortunately although this theory sounds plausible it does not work out in practice to produce rain.

Numerous devices, such as those we have just described, are at present being offered to hundreds of farmers to break the drought. The officials of the United States Weather Bureau brand these devices as pure fakes, and the men who are enriching themselves at the farmers' misfortune are nothing but scoundrels.

Science has not yet discovered all the facts of meteorology. We are still at the mercy of the elements, just as our ancestors were thousands of years ago, except that we have provided ourselves with better shelter. Until our knowledge of weather is more complete than it is at present, it will be almost impossible to control or to make rain when we need it, because we do not understand all the underlying causes. Until then, farmers can do nothing in times of drought, in spite of the claims of inventors or professional rain makers.

FISH CROP OF THE CANADIAN PRAIRIES

THE Canadian prairies raise other crops than those of grain. Recent Canadian Government statistics show that more than $4,000,000 was paid last year for fish caught on the prairies.

This new industry has arisen in the three central provinces of Canada, which because of their wheat-growing facility have been called the granary of the British Empire. Commercial fishing is an established industry, reaching north as far as Lake Athabasca. On the shores of this lake, nearly 1,000 miles distant from Winnipeg and some 1,700 miles from Chicago, are factories where whitefish and trout are caught in large numbers to be frozen, packed in special wrappers, boxed and shipped by refrigerator barges down the Athabasca River to Waterways, the end of steel, 200 miles distant to the south.

There are innumerable lakes in the prairie provinces. Each year during the past few years has seen more and more boats of all sorts going northward to the unfished lakes of the region. Fishermen are stationed at these lakes far from the railways and are out daily during the summer season, pulling in their nets and bringing their catch to their station where a boat comes every day from the central station of the fishery company to call for the load. By easy stages the fish is brought to the railways, carried that far by water craft.

In winter the fishing still goes on. A large portion of the annual fishing sales consists of winter-caught fish. Through holes in the ice the fishermen work their nets, and daily they go out to haul in the fish which have thus been captured under the thick ice. Horse-drawn sleighs call once a month during the winter months, making their way over the ice from lake to lake. The sleighs

are loaded with the boxes of frozen fish, which are dressed on the ice, and packed in weather that is usually thirty below zero and often down to fifty below. By sleigh the fish are taken to the railway.

Commercial fisheries are of the opinion that the fish business of the Canadian prairies is still in its infancy. They see a great future for the business with the coming of better transportation facilities. Railways are now being built farther north in the prairie provinces, and they will tap the fish districts, aiding a growing industry which brings whitefish, tullibee, pickerel, grayling, trout and sturgeon to the tables of the prairies and the midwestern states of the United States.

EARLY RECOGNITION OF WHOOPING COUGH

DELAY in quarantine of whooping cough which exacts a death toll twice as large as scarlet fever is deplored by Dr. Louis W. Sauer and Leonora Hambrecht, of Evanston, Illinois, in a report to the American Medical Association, recommending early diagnosis by the cough plate method.

Under the present system of diagnosis, quarantine is not usually established until after the period of greatest contagion has passed, these authorities charge. This is because the familiar whoop does not appear until the illness is well advanced. It is not necessary for the doctor to await this symptom in a suspect case, however, as the pertussis bacillus which causes the whoop can be detected by cough plates or disks which are held three or four inches from the patient's mouth during a coughing spell.

Cough plates are made with a coating of boiled potato, glycerin, agar and blood mixture, prepared under conditions most favorable for the speedy growth and detection of the whooping cough bacillus. To properly expose them for diagnosis, a deep explosive cough is desirable. Should the patient prove unable to cough to order, a drink of cold water, a brisk run or a forceful slap between the shoulder blades is usually effective in bringing on an attack.

Successful trial of the cough-plate method of diagnosis has been made by the Copenhagen Health Department, while in America the Commission for the Study of Whooping Cough has reported favorably on its use.

Importance of the early detection of whooping cough is in the prevention of epidemics. In the treatment of individual cases, however, it is not particularly helpful.

ITEMS

PELLAGRA has increased during the extreme summer drought in practically all the southern states, according to reports received by the U. S. Public Health Service. Spread of the disease is believed to be due more directly to unfavorable economic conditions than to the severe heat and dryness, but indirectly the drought has been an important factor in reducing crops and bringing about the food scarcity that causes pellagra. Exact statistics on the cases of pellagra in the various states are not available, but an increase in cases has been noted in North and South Carolina during the past several months and more recently health workers in Kentucky and Arkansas have reported worse conditions.

FAD diets, modern habits of living, self-prescription and overuse of laxative medicines and mineral oils, and infection, either directly or from foci, are among the possible causes suggested by doctors to explain the sharp rise in the appendicitis mortality rate during the last nineteen years. In 1928, more than 18,000 deaths in the United States were attributed to this cause alone. Reports issued by the Metropolitan Life Insurance Company, based on records of policyholders, show an increase of 20 per cent. in the death rate for white males and a 14 per cent. increase for white females during the last five years of this nineteen-year period as compared with the first five years. More men died from appendicitis during the entire period than did women and apparently they are becoming increasingly susceptible to the disease. During the nineteen years there has been immense improvement in surgical technique and focus of interest by the public and physicians on the disease has insured early diagnosis thereby improving conditions for recovery, but still the fatalities grow.

ITS return heralded by unauthorized press reports that it had unearthed the skeleton of a prehistoric giant race which once inhabited America, and specimens of the silk or linen clothing worn by these ancients, the expedition of the University of Pennsylvania Museum has returned from excavating an old Indian mound near Wheeling, West Virginia. Mr. Charles Bache, leader of the expedition, stated in his report that very important discoveries were made at the mound. The expedition uncovered large spear heads of stone, some more than six inches long, cut into blades by prehistoric Indian warriors. The mound also yielded fine tobacco pipes carved by these Indians of pre-Columbian times. Mr. Bache declared incorrect the advance news reports that these prehistoric men were forerunners of the Indians and occupied America before the red men. He stated that the skeleton in the mound was of normal size. What was reported as fabric was probably fragments of bark wrappings.

RAYON and other synthetic cellulose fabrics will soon be underselling cotton goods as they are now underselling silk. So prophesies Professor Charles E. Mullin, head of the division of textile chemistry at Clemson College. One company, he states, has already announced that it can produce viscose yarn at a lower price than that of medium or fine cotton yarns of the same size. Synthetic fibers are competing with silk not only in price, but also in fineness. It is now possible to produce filaments that are two and one half times finer than those of true silk. These are being made on a commercial scale both in America and abroad. It requires more than 4,225 miles of one of these filaments to weigh a pound.