SCIENCE NEWS

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THE ST. LOUIS TORNADO

THE tornado that devastated parts of St. Louis on September 29 was not an unusual storm from the standpoint of the meteorologist except for the fact that it unfortunately occurred in a densely populated area.

Like most of the tornado disturbances for which the Mississippi region is noted, the recent storm left in its wake at least four affected localities, according to unofficial reports reaching the main office of the U. S. Weather Bureau. Tornadoes were reported at Muskogee, Okla., in northwestern Arkansas, St. Louis and near Danville, Ill. A line running northeast can be drawn through these places indicating that the general storm giving rise to the local tornadoes moved in this direction. This is another confirmation of the meteorological belief that the tornado storm travels from the southwest to the northeast.

The spinning whirls of destructive winds are not themselves in the center of the general storm giving rise to them. In the recent disturbance the "low" area where the barometer registered the least atmospheric pressure was somewhat to the northwest of the point of destruction. On the morning of the St. Louis tornado the "low" was in western Nebraska, in the evening twelve hours later it had moved to southeastern Minnesota and the next morning it was northeast of Lake Superior.

The most vicious storm on earth, exceeding in violence the tropical hurricane, the tornado is fortunately of short duration and covers only a small area of the earth's surface. At any one place the storm does not last more than a few minutes.

At St. Louis a wind velocity of 72 miles an hour was officially measured by the Weather Bureau station over a period of five minutes, but it is probable that gusts at the storm center were much higher. From the destruction caused and the way bridges, houses and other heavy objects are handled by the wind, the velocities must reach 400 to 500 miles an hour in some tornadoes.

The cause of the tornado is essentially the same as that of a severe hail or thunder storm. From the west or northwest comes cold air which overrides warm, moisture-laden air from the south or southwest. The surface of contact of the two winds is a slanting one so that about a hundred miles east of the trough, as the line of contact at the ground surface is called, the two winds clash at a height of about a mile. It is at about this point that the so-called funnel-shaped cloud usually forms, whirling like a top and carrying within it reduced pressure which causes houses in its path to literally blow up because of the released pressure within them. The warm air beneath, charged with moisture and immense energy, sets up a most violent convection and vertical overturning of the atmosphere which results in the typical tornado vortex, an immense eddy in the ocean of air.

Due to the limited area affected by the tornado and the impossibility of predicting just where it will occur, the Weather Bureau does not attempt to issue forecasts of these storms other than to warn of "severe local storms." If tornadoes were definitely predicted hundreds of thousands of people might be unnecessarily worried and the loss due to this condition might greatly exceed the damage that might be prevented.

About a hundred tornadoes occur each year in the United States and they take a toll of about 300 lives yearly on the average. The tornado season for most of the country is from March to October. Little can be done to protect against the tornado, but meteorologists give this advice: If you see the tornado cloud advancing toward you, run northward or toward the northwest, in the direction of your left hand as you face the coming storm. If there is a "cyclone" cellar or tornado cave, get into it as soon as possible. In a frame house the best thing to do is to go to the southwest corner of the basement. A frame house is likely to be taken off its foundations intact. In a brick or masonry structure, do not go to the cellar as that is the most dangerous place. The tornado will disintegrate the brick house at once, whirling the débris into the basement.

THE TREATMENT OF EPILEPSY

EPILEPSY, the mysterious, incurable "falling sickness" that has afflicted mankind since the beginning of history, is now under medical attack from three separate angles.

Several years ago it was established that starvation brought about certain changes for the better in epileptics so long as they could endure the drastic treatment. Recently a diet that approximates some of the conditions of starvation has been found to give very successful results with epileptic children. Confined to the prescribed diet which calls for much fat but little sugar, afflicted children have shown marked improvement lasting over a period of years.

In addition, careful and understanding psychological handling has proved to be of great value in avoiding much of the mental and emotional strain that leads up to epileptic seizures.

Now a new weapon in the shape of the drug luminol-sodium is announced by Dr. J. Tyler Fox in a report to the medical journal, *Lancet*. Dr. Fox has tried out the drug in carefully regulated doses on members of the epileptic colony in Surrey, of which he is superintendent. Of 167 cases, 50, or around 30 per cent., showed benefit that is likely to be permanent. Fifty-one cases after registering improvement for a period of three months apparently became tolerant to the drug. The remainder either showed only temporary gains or remained unaltered by the treatment. A very few became worse.

The best results are to be expected from young patients. Some patients have continued to receive the treatment for periods as long as four years. The drug should be administered with great caution because in some cases the number of fits have increased after the luminol was stopped. In a few cases where the number of fits de-

creased the behavior of the patients became violent and uncontrolled. The treatment appears to be of benefit in certain types of cases, but should not be undertaken where careful supervision and accurate records of each seizure can not be maintained for each patient.

OVERPRODUCTION OF GRAPES IN CALIFORNIA

SERIOUS overproduction of grapes in California is in prospect, in spite of an ever-increasing demand by eastern home wine-makers. A newly issued bulletin of the California Agricultural Experiment Station, written by S. W. Shear and H. F. Gould, is devoted to a discussion of the economic status of the grape industry in California.

"The rapid expansion of the grape industry in California as compared with the rest of the United States has been primarily the result of prohibition, which caused a sudden and great reduction in the utilization of wine grapes by California wineries and a gradual but tremendous increase in eastern consumption of fresh wine and raisin grape varieties for juice purposes. Before 1915 practically none of the grapes shipped from the state were designed for wine-making. By 1921, however, almost 20,000 carloads of juice stock were shipped, and in the last two years an average of nearly 50,000 carloads, or approximately 70 per cent. of California's grape shipments, have been juice stock."

The many varieties of grapes grown in California can be divided into three main classes: wine, raisin and table grapes, according to the uses for which they were bred. However, the authors state, a considerable proportion of the raisin and table varieties are now diverted to wine-making, in addition to the entire wine grape crop.

The great demand by the eastern market for grapes has led, as might have been expected, to a large increase in vineyard acreage, both in California and in other states adapted to vine culture. The Great Lakes states, particularly New York, furnish heavy competition in certain types of grapes. The Ozark region in Arkansas has also developed into a great vineyard country. Finally, California's next-door neighbor, Arizona, has taken to raising grapes of types very similar to California's own.

The two economists recommend a curtailment in new acreage, and better cultivation practices to cut production costs, as means for keeping prices at a level that will show a profit for the grower.

STONE AGE SKULLS FROM AFRICA

WHAT was the strange race of men that lived in equatorial Africa in the twilight time between the Old Stone Age and the New?

An English anthropologist, L. S. B. Leaky, who has been conducting extensive excavations in Kenya Colony, brings back with him a budget of extremely puzzling skeletal remains but refrains for the present from offering any answer to his own riddles.

Most of the bones he found at his two principal working locations, Mr. Leaky states, were badly broken, but he did find at least one skeleton in nearly perfect condition, and several good skulls. The skulls are most extraordinary. They do not resemble the skulls of the Negroes now inhabiting the locality at all, and they are very little like any Negro skulls, except that they are very narrow for their length.

Their faces, however, are high and narrow instead of being short as typical Negro faces are.

One of the most notable characteristics that marks these skulls as non-negroid in aspect is the very narrow nose-opening. The average Negro, of course, has always been noteworthy for his wide nose. One of the skulls also exhibits a most extraordinarily high palatal arch. The top of the palate is 29 millimeters, or over one and one eighth inches, above the grinding surface of the teeth. This is seven millimeters higher than the corresponding measurement in the average European mouth, and 13 millimeters higher than that in a number of Negro skulls measured locally.

Associated with the human remains were many stone arrow and spear points and bits of pottery. The workmanship corresponds in a general way with that of similar finds in Europe belonging to the transition period between the Old Stone Age, when men used chipped stone implements, and the New Stone Age, when the art of a finer polished finish was discovered.

THE QUADRUPED METHOD OF LOCOMOTION

IF a baby is learning to creep on all fours like a bear —and he probably is not, for such cases are very rare— he is showing atavistic traits. Dr. Aleš Hrdlička, of the Smithsonian Institution, describes in a forthcoming issue of *The Journal of Physical Anthropology* five such cases of babies that prefer the quadruped method of locomotion before they learn to walk. Most of them are between one and two years old and actually travel on all fours like little animals, not putting their knees on the ground at all as babies normally do in creeping. The babies came from the widely different races, white, American Indian, Negro and Australian, and are all healthy, physically normal infants.

They run on all fours easily and by choice, not by accident, through imitation or by being so taught. They all show the same type of posture and progression, with nothing strained or cumbrous in either posture or movements.

The immediate cause of running on all fours can only be explained at the present time, Dr. Hrdlička believes, on the simple grounds that these children find it the easiest and most efficient mode of locomotion at this particular stage of their development. If this were the only reason, however, creeping as a bear walks would be the exception rather than a rule; so it appears that there must be some additional factor connected with the nervous system.

"In general," Dr. Hrdlička explains, "in the human child of to-day, this factor is evidently dormant, and so, though the little body would lend itself, there is no incentive to running on all fours. Such a dormant impulse may perhaps be aroused accidentally by some chance trial but it is more likely that in instances this impulse is

stronger than in the general run of infants, resulting in the quadruped progression. Such a mental impulse in an otherwise normal and healthy child could hardly be ascribed, it would seem, to anything else than something of an atavistic nature.'' One observer, he adds, has reported that walking on the hands and feet, exactly like young apes, is common among babies of tribes of West Africa.

THE PSYCHO-GALVANIC REFLEX

As the result of the researches of Dr. David Wechsler, of New York City, the skin has been found to be a delicate emotional barometer, greatly increasing its resistance to the passage of electricity when one is quiescent, but permitting the current to go through much more readily when the feelings are even moderately aroused.

Of all the tissues of the body, the skin is one of the best insulators. The flesh and blood within conduct electric currents very easily, but the skin serves as a protection against these as against many other external vicissitudes. But like all non-conductors, it offers much less resistance when it is moist.

It is of this latter fact that Dr. Wechsler has taken advantage. It is common knowledge that we perspire, sometimes very heavily, under severe emotional stress. The cold sweat of fear, the flushed, damp face of anger, are familiar examples. But even less extreme emotions, it has been found, cause a less perceptible but stilll unmistakable moistening of the skin.

Dr. Wechsler's procedure is simple. He includes a part of his subject's skin in an electric circuit by having him dip his hands, or even merely two fingers, in salt solutions in which two wires end. In the same circuit he includes a sensitive instrument to detect and record changes of the current.

So long as the subject is sitting still and thinking of nothing in particular, the indicator hangs motionless. But if a sentence is spoken, or an object or picture shown, which arouses his interest, anger or fear, the indicator instantly jumps upward, indicating an increase in the amount of current which has passed, corresponding to a decrease in the resistance of the skin.

One of the first suggestions made for the use of this method was of its possible value in criminology. Naturally a criminal would have a rather marked emotional reaction if some one suddenly snatched away a curtain, revealing the corpse of his victim. But Dr. Wechsler emphasizes the statement that this will not be its principal use by any manner of means. The apparatus can measure reactions much more delicate than that, it is stated.

In one experiment a mathematical problem was set before a mathematician and his conductivity curve rose to a peak, where that of an ordinary person would not have come out of its regular straight line.

In another test, a number of machine operatives were examined together, and their sensitivity as measured by the apparatus was found to run closely parallel to their known records of comparative skill. The principal use of the electrical emotional tests therefore is expected to be found in the field of vocational guidance.

ITEMS

VITAMIN C, the substance that wards off scurvy, is present in milk as well as in the fresh vegetables usually relied upon to supply it, and included for this reason in all standard diets for children. Professor L. F. Meyer, of the University of Berlin, states this as his conclusion after an extended series of experiments. Professor Meyer was led to undertake his researches by the high occurrence of scurvy among the children in German cities during the period of hard times just after the war. Not only the fully recognizable disease but also such partial forms as arrested growth and sub-normal development among children were distressingly manifest. While the supply of fresh vegetables was not up to standard, the German scientist suspected that the milk shortage also had something to do with it. Tests on guinea pigs kept on a deficient diet have shown that milk can prevent scurvy, he says. Human milk stands at the top of the list as a source of vitamin C, thus explaining the fact that breast-fed babies rarely or never contract this disease. On the other hand, Dr. Meyer found that goat's milk, much used in Europe for infant feeding, is quite deficient in this necessary substance. In this respect cow's milk is much superior to that of goats.

GAMBUSIA, the littlè fish that befriends man by devouring mosquito ''wigglers,'' is finding things even more to his liking in the ponds and ditches of Italy than in his native American home, according to reports received from Rome. Carried first to Spain and thence to Italy to combat the malarial mosquitoes, this hungry little minnow has multiplied enormously throughout the region around the mouth of the Tiber, where it was first introduced, and has also been transplanted into shallow waters throughout the peninsula and along the Dalmatian coast. More favorable food and other environmental conditions, and probably the absence of natural enemies that take toll of its numbers in America, are credited with the gratifyingly abnormal rate of increase.

How the British hold the cholera situation in hand when ten million Hindus set out on a pilgrimage is one of the dramatic episodes revealed in a report just issued of the tenth extraordinary session of the health committee of the League of Nations. Approaches by rail and by road to the districts of Hardwar and Muttra where pilgrims by the million concentrate on the occasion of the Hardwar Fair were protected by inspection posts and first aid stations. Barbed wire entanglements barricaded ponds of stagnant water from the onslaughts of thirsty travelers. Safe supplies of drinking water were stationed along the route, while the river water at Bhimgoda temple where the pilgrims bathed was purified by chloride of lime. Cholera inoculation free of charge was provided for at hospitals along the way. The project of compulsory inoculation of all pilgrims for Asiatic cholera had to be abandoned as impractical on account of the vast numbers of individuals involved. As a result of these precautions only 38 cases were notified after the fair, according to the report. Of these 36 were imported from other provinces; some as far away as Bengal and Assam.