SCIENCE NEWS

Science Service, Washington, D. C.

BETTER HOUSING AS A PREVENTIVE OF RHEUMATIC FEVER

REPLACING the poorer homes in the nation by proper housing facilities and eliminating other bad effects of housing were recommended, as measures for prevention of rheumatic fever, by Drs. Carroll M. Pounders and James K. Gray, of the University and Crippled Children's Hospitals in Oklahoma City, at the meeting of the Southern Medical Association.

Rheumatic heart disease, according to one estimate quoted by Drs. Pounders and Gray, makes up from 35 to 40 per cent. of all cases of heart disease among adults. It is pointed out that rheumatic fever is not just a disease of the joints. It is an infectious disease which affects various parts of the body, but shows up chiefly in the heart, the joints and surrounding structures, the nervous system and tissues just under the skin. When the nervous system is affected, the condition is termed chorea or St. Vitus' Dance. "It is predominantly a disease of school age," Drs. Pounders and Gray stated, "and flourishes among the poor where there is overcrowding, bad sanitation, improper heating and damp dwellings. It is of great importance because of its contribution to cardiac (heart) invalidism and deaths, both during childhood and later adult life."

The exact germ which causes the ailment is not known, but it is suggested that probably the germ, whatever it is, remains alive in the body tissues over long periods of time, repeatedly flaring up to cause more attacks of illness. No idea of the actual number of cases of the ailment is possible because the disease is not reportable like scarlet fever or measles. It is generally estimated to make up from three to seven per cent. of the medical diseases observed in children's hospitals. Girls seem to be somewhat more susceptible to this ailment than boys.

Dampness and chilling are regarded as important factors in the disease. The general use of natural gas for cooking and heating is, in the opinion of Drs. Pounders and Gray, responsible for producing artificially in the semi-arid southwest the damp environment that is strongly conducive to this illness. This natural gas, being a hydrogen gas, it was explained, produces a great deal of moisture when burned. The very poor people in this region who live in tents and shacks do not have as much of the disease as the better class of poor who burn gas in tightly constructed, poorly ventilated dwellings, where it is not uncommon to see the furniture, walls and ceilings literally dripping wet in cold weather.

For treatment of active cases of rheumatic fever Drs. Pounders and Gray advised long periods of rest, nourishing food and proper hygiene with a gradual resumption of exercise after activity of the infection is thought to be arrested.

MALARIA IN THE SOUTHERN STATES

MALARIA in our southern states is so wide-spread and such a "stupendous" problem that it probably can not be wiped our during the lifetime of the present generation of inhabitants, members of the National Malaria Committee, meeting in Oklahoma City on November 17, were told by Colonel W. N. Bispham, of the U. S. Army Medical Corps.

The total number of persons infected with malaria in seven southern states, South Carolina, Georgia, Florida, Alabama, Tennessee, Mississippi and Louisiana, is 1,600,000, according to Colonel Bispham's estimate. Nothing like the total number of cases is reported to health authorities. He charged both authorities and practising physicians with lack of concern or of taking a hopeless attitude toward the problem.

He stated that "Malaria infection in the southern states is a very serious problem which has received very little recognition not only by the governing authorities but also by the medical profession. This is a very comprehensive statement and it may be challenged, but an extensive study of the disease in all the southern states except Arkansas and Texas and contact with health officers and practising physicians throughout this area has confirmed this opinion. During the last few years considerable amounts of WPA funds were allotted to states and counties for the prevention of malaria. Most of this money was expended by state and county officials without expert supervision, and though it is acknowledged that probably a number of very bad breeding areas have been eliminated, the work has proceeded in such a way that the neglect of a few years will duplicate the condition remedied. The money provided has been spread over such a large area that there has been no effect on the death rate and apparently the number of cases remains essentially the same."

Colonel Bispham outlined a plan which he said is the "only way to conduct malaria prevention work successfully." This consists in selecting an area of suitable size, preferably a county, where malaria is so prevalent as to seriously menace health and where the support of authorities and population can be relied upon. A complete examination of school children should then be made to determine the amount and type of infection and the location of malaria infection in the county. A survey of all mosquito breeding places within a mile of each such spot or focus of malaria infection should then be made by a mosquito expert. Next an engineer familiar with eradication of mosquito breeding areas should survey the area, and after this plans for mosquito eradication can be made and money allotted to cover the necessary costs. In addition a campaign of education on malaria prevention should be instituted and complete treatment of all infected persons should be provided.

COLLAPSED NEUTRON STARS

ASTRONOMERS can not definitely prove it, but they strongly suspect that there are stars in the sky which, although shining, can not be seen. This seeming paradox would come about if the stars were of extreme density and

so possessed an enormous gravitational force which would act strangely on the light which they might emit.

This gravitational force would do two things, according to Professor Fritz Zwicky, of the California Institute of Technology, in the *Astrophysical Journal.* It would make the light from these stars slow up so that it would take the rays an infinitely long time to reach an external point. And the light—even if it did arrive—would reach an external point with zero energy and hence could not be detected by any instrument known to science.

Such stars would be of a type called collapsed neutron stars and would represent the lowest states of energy which matter could possess without actually turning into radiation. It is believed that neutron stars are the final end product of those enormous stellar flareups known as super-novae which, about once in 300 years in our galaxy, flare up to super-brilliance and then quickly drop back to obscurity. The concept of collapsed neutron stars was postulated to explain the amazing outpouring of radiant energy which super-novae possess for their brief period of brightness. While astronomers can not, of course, hope to observe the stars which have reached the final paradoxical state cited here, they can study stars which apparently are passing into the collapsed neutron state.

One super-nova, known as IC 4182, reached its maximum brightness in August, 1937, and has since been watched closely. The estimated surface temperature of the central star of this super-nova is about 3,100,000 degrees Centigrade. Its density is such that a cubic centimeter of it would weight about 2,460,000 pounds. And in a year of observation its light characteristics, as determined by its spectrum, shifted toward the low energy, or red colors, by an amount of 100 Ångstrom units, an amazingly large displacement attributed to growing gravitational forces on the star.

ACOUSTICAL PROPERTIES OF THE VIOLIN

A MODERN maker of inexpensive violins has at least approached the secret of the old Italian masters, according to a report by Professor Frederick A. Saunders, of Harvard University, to the American Acoustical Society. Tests show that a $200 German instrument, copied after an old master, produces steady tones whose quality is closely similar to that of one of the best old Italian violins.

The modern violin was made by Dr. F. J. Koch, of Dresden, a distinguished electrical engineer who has supported the manufacture of fine violins as a separate interest. Dr. Saunders did not disclose the identity or make of the old violin. While asserting that the report contains the best evidence he has yet obtained that the secret of Italian violin mastery may be within reach, Dr. Saunders pointed out that his tests are only partial. He has concentrated on finding the variation from note to note in the musical scale of the strength of the natural vibration and sound emission of a violin. Every violin has its individual points of strong and weak vibration, and for the most part this determines the tonal quality of the instrument. But there is a strong possibility, as yet unexplored, that the tone quality depends also on the quickness—measured in thousandths of a second—with which the violin body responds to string vibration.

Dr. Saunders has tested the acoustical properties of violins for many years, seeking an impartial answer to the question whether the old master Italian violins are actually superior in tone, and, if so, how modern violins can be made inexpensively to duplicate these tones. He has studied 37 instruments, including several by Stradivarius, by the Gaurnerius family and other famous makers.

Two weeks ago the celebrated violinist Jascha Heifetz assisted Dr. Saunders by bowing his violins before the Harvard microphones. Dr. Saunders'' tests are made with an automatic sound analyzer which in a few seconds makes a photographic record of the relative strengths of all the harmonics —fundamental tone and overtones—of a musical note. Each of the sixty-four notes of a violin is separately recorded, and the harmonics are tabulated according to strength. From these data a response curve can be drawn showing clearly the frequencies at which the violin has strong natural resonances, and also where the sound emission is weaker.

Dr. Saunders showed that the response curves for the Koch violin and the old Italian instrument were almost identical in strengths and weaknesses from the lowest to the highest notes.

INDUSTRIAL ADVANCE IN THE SOUTH

REMARKABLE as are the opportunities for industrial growth in the South, there must be no expectation that advancement of southern industries can be achieved by some semi-magical means which is the special property of the land south of the Mason-Dixon line.

This, in summary, was the advice of Dr. Harrison E. Howe, editor of the American Chemical Society's official journal, *Industrial and Engineering Chemistry,* presented on November 18 to the symposium on the Changing Economic Base of the South. This symposium was sponsored by Duke University, Durham, N. C., in connection with its centennial celebration.

The South has an excellent chance for major industrial gains by the study and solution of its own special problems. While it may gain some industry through migration of plants to the milder climatic conditions and because of lower cost of building construction, it must not place too much reliance on making its gains at the expense of other industrial sections of the nation. Dr. Howe pointed out that the factors of favored climate and lower construction costs often are balanced in the end by the greater freight charges required to bring the manufactured merchandise back into the large buying markets of the East and Central West.

The growth of the newsprint paper industry and the development of an industry to utilize sweet potato starch were two examples cited by Dr. Howe as important and soundly-based industries of the South founded on time-tried principles of scientific research. Much more can be done by a sound application of scientific advance to the local problems of the South than can be achieved by any other method.

PENNSYLVANIA AMATEUR RADIO OPERATORS

TWENTY-SEVEN ''ham'' radio operators, linked in the Susquehanna Emergency Network, on November 19, demonstrated to radio listeners in the eastern part of the

United States how they and their comrades of the ether have served isolated communities in the past and what they will do in the future if flood waters come again to the Susquehanna Valley.

Under the leadership of their network control, Charles G. Landis, of York, who operates Station W3UA, stages monthly emergency communications drill to keep in tune for efficient operation whenever their services are required. Amateur radio operators, almost all of whom are members of the American Radio Relay League, have provided invaluable communication facilities in the past whenever disaster cut off ordinary means of communication. Many of them operate on batteries or have their own small power plants, thus being independent of local power supplies which usually go out with the wires. This is not true of most commercial radio stations.

Messages, most of them in voice, but a few in code, are transmitted by the operators to Mr. Landis's station. He in turn relays them to Roy Corderman, W3ZD, of Chevy Chase, Md., on the outskirts of the District of Columbia. Mr. Corderman relays the messages by telephone to the American Red Cross headquarters in Washington or to other parties concerned with emergency work. Mr. Corderman and the amateurs behind him were the ones who kept the Red Cross in close touch with isolated communities such as Westerly, R. I., during the recent New England hurricane.

On November 19, Chairman Frank R. McNinch, of the Federal Communications Commission, emphasized the importance of the amateurs in keeping lines of communication open; Merrill Bernard, chief of the river and flood division of the U. S. Weather Bureau spoke of the part played by the radio "hams" in supplying flood data, and James L. Fieser, vice-chairman of the Red Cross, emphasized amateur emergency aid over the same commercial network to endorse the amateur network idea. Several other such chains have already been set up for emergency use in other parts of the country; they hope to encourage the formation of still others.

ITEMS

DANGER to our elms lurks in woodpiles containing elm logs with the bark on, according to Dr. J. H. Faull, of the Arnold Arboretum. In the Dutch elm disease area, these logs often harbor infected elm bark beetles, ready to fly on and spread the infection as soon as spring comes. Such wood should all be burned before the end of cold weather.

LEAFY spurge, one of the worst weeds in the Northwest, can be kept down, experiments at the North Dakota experiment station have shown, by close grazing with sheep. Ewes lost weight on it (which they also did on grass pasture) but lambs gained better on the spurge than they did on grass.

DUTCH chemists have developed successfully a synthetic plastic material derived from potato flour, it is reported from The Netherlands. The new product is called "anras-glass" in its transparent form and "amylite" in opaque form. It is said to be easily bored, sawn, ground, bent, shaped, colored and decorated.

ELECTRICALLY charged wire fences can have other than military uses. At the North Dakota experiment station, a device for sending a six-volt current through a fence has been developed by H. F. McColly, agricultural engineer. The current is low enough so as not to injure livestock, but strong enough to make them steer clear of the fence after touching it once of twice. It is not sent continuously but in intermittent "jolts," which gives maximum effect and also saves electricity.

TEN of Kansas State College's unique white poultry have been sent to Sweden where they will be used in genetics experiments, according to letters from Dr. Gert Bonnier, geneticist at the Institute for Hufdjursforadling at Wiad, Sweden. The unusual poultry have white plumage, frizzled feathers and crested heads. They are said to be the only fowls in the world that combine these three characteristics. Dr. Bonnier wrote to Dr. D. C. Warren, professor of poultry husbandry at Manhattan, Kansas, that he was unable to find poultry with these three characteristics desired for his genetics experiments anywhere in Europe. "The birds are not of any recognized breed," said Dr. Warren. "Their combination of characteristics makes them admirable subjects for research in the field of genetics."

GREAT quantities of bones of Ice Age animals have been dug out of asphalt deposits known as the McKittrick tar seeps, about 30 miles west of Bakersfield, Calif., by a party working under the direction of Dr. Chester Stock, of the California Institute of Technology, and research associate of the Carnegie Institution of Washington. The fossils are similar in many respects to those of the same age found in the famous La Brea pits in Los Angeles. They include sabertooth cats, giant lions, short-faced bears, grim wolves, as well as the more numerous remains of the herbivorous animals that attracted them, such as bison, horse, camel, musk-ox, deer, elk and pronghorn. There are also many bird bones, especially of waterfowl, suggesting that at some time there was a lake in the region, despite geological evidence that during the Ice Age conditions there were considerably more arid than they are now.

A NEW compact voltage regulator for industrial electrical generators has been announced by C. R. Hanna, of the Westinghouse Research Laboratories. The device is designed for plants producing their own power. The device keeps independent generators giving power at constant voltage, regardless of the load on the power line in the installation. Ordinarily such generators have the human-like trick of lagging at their work when heavily loaded. They also produce too much voltage when the power load, drawn from them, is light. A past method of overcoming this difficulty was to have a man regulate the generator's output by hand control of rheostats. The new device consists of a number of graduated electrical resistances which can decrease or increase the generator's speed, and hence its power output. The selection of these resistances is effected automatically.