SCIENCE NEWS

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WARFARE AMONG ANTS

WAR at sight is not the rule in the ant world but rather the exception, despite wide-spread belief to the contrary, according to Dr. Laurence J. Lafleur, of New York City. When two stranger ants meet, instead of instantly beginning battle, they usually merely back off, turn aside a little, and go their respective ways. He states in a communication to the *American Naturalist* that "Except when slave-making ants make raids on their neighbors, and when spring competition for extra land causes wars, the ants of the northern states are a peaceful lot."

Even the slave-making species are not necessarily murderous in their raids, Dr. Lafleur points out. He cites the observation of the late Professor William Morton Wheeler, of Harvard University, who watched such a raid in progress. Slave-making ants in such raids are concerned only with the pupae or immature infants of the species they kidnap and carry off to be their servants. In the attack described by Dr. Wheeler, the marauders, much bigger and stronger than their victims, nevertheless did not kill them, but only carried the defenders out of the nest and set them down outside, uninjured.

Another struggle described by Dr. Lafleur was over a herd of aphids or "ant cows," whose sweet body-secretion is much prized by many species of ants. Although two rival ant armies were staging a rough-and-tumble contest, they refrained from tearing each other to pieces. Some of them even took time out to go and "milk" the aphids.

In still other cases, groups of stranger ants, even of different species, were forcibly mixed to see what they would do. Sometimes they fought for a while, then became a united, cooperating group. Sometimes the cooperation ensued without any preliminary fighting.

WILD RUBBER ON WASTELANDS IN THE WEST

MORE than 25,000 tons of wild rubber is hidden in the stems and roots of rabbit brush, a weed that grows thick on alkali flats and other wastelands of the West, according to Professor T. Harper Goodspeed, of the University of California. He has called attention to this unutilized resource in messages to the Federal Government and to the Governor of California.

Rabbit brush is a shrub, whose various species grow from knee-high to twice the height of a man. Its rubber occurs in the form of solid bits and shreds embedded in the tissues, as it does in its better known botanical relative, guayule. Hence, the same methods of harvesting and processing could be used that have been successful in extracting guayule rubber. It is not claimed that rabbit-brush rubber could compete with the East Indian product under normal conditions. It is not quite so high in quality, and it costs more to prepare; Professor Goodspeed estimates about 45 cents a pound. However, in the present emergency it might be worth while despite relatively high costs.

Estimates of the amount of rabbit-brush rubber that might be eventually harvested range all the way from a low of 10,000 tons to an extreme high of 250,000 tons. Certainly the sixteen major species of the shrub cover an immense area, from southern California to the northern Rockies. Some of them grow on alkali lands completely useless for any other purpose. Others have moved in as weeds on rangelands that have been seriously over-grazed.

The most practicable harvesting method, probably, would be to pull the plants up by the roots, using teams or tractors. This is because a considerable part of the rubber is embedded in the roots. The same uprooting process would serve to clear the range, permitting native grasses to grow again and thereby prepare the way for increasing another war resource, the meat and leather supply. Along with the rabbit brush, several other related rubber-containing weeds could be uprooted and processed, notably two genera known as Acraderica and Aplopappus.

The rubber of the rabbit brush is known as chrysil rubber, the name being derived from the plant's botanical title, Chrysothamnus. This comes from two Greek words, meaning "golden bush." The name is well bestowed, for when it is in bloom every twig on the plant ends with a brush of beautiful, goldenrod-like flowers. Like guayule, rabbit brush is a member of the composite family, which includes goldenrods, dandelions, asters, sunflowers and the sinful, sneeze-causing ragweeds.

BLIND LANDING OF AIRPLANES

BLIND landing of airplanes is facilitated by a new invention using a low-power low-frequency transmitter, thus making for economy in the use of power, and useless to enemy planes not equipped with the device. The inventor is William Lee Clemmer, of Monroe, Wisconsin, who has been granted U. S. Patent 2,269,437.

The invention enables an aviator to fly into the neighborhood of a landing field at a safe high altitude, say 6,000 feet, and then spiral down until he has reached an altitude from which he can glide on to the field at a safe gliding angle. This the device makes possible by indicating continuously on the instrument board the angle between the direction of the transmitter and the horizontal.

The accuracy of the instrument is indicated by the fact that at a distance of half a mile from a transmitter of six watts output on 375 kilocycles, this angle was measured to an accuracy of one sixth of a degree.

The low-power low-frequency transmitter produces an "induction field" in the immediate vicinity of the antenna. This is a static field that surrounds the antenna equally in all directions (*i. e.*, not a beam) and stays with it, very little energy being radiated away in the form of waves. Since the intensity decreases rapidly with the distance, it extends, to a measurable degree, only a few miles. It is not subject to the freakish reflections and disturbances of high-frequency radiation.

The pick-up on the plane is actuated only by the in-

ductive effect of this field, not by radio waves. It does not interfere with the use of a high-frequency beam or other means for guiding the aviator to the vicinity of the field, but helps him to land from a high altitude as on a field in a valley between high mountain ranges.

TYPHUS

A MAJOR epidemic of typhus fever is unlikely in either England or, for the present at least, in Germany proper, even though the disease is widely prevalent, according to reports, in German-occupied countries and in Spain and perhaps in northern Africa.

Lice spread the disease, but it is not solely attention to cleanliness, and therefore fewer lice, that will help protect England and Germany from typhus fever epidemics. Two other factors are essential for the development of a major typhus fever epidemic: (1) A focus of typhus fever cases from which the lice can spread the disease; (2) a disorganized population.

Dr. R. E. Dyer, the newly-appointed director of the National Institute of Health of the U. S. Public Health Service, pointed out that "No big epidemic of typhus fever has ever taken place unless, in addition to lice and a typhus focus, there was also a badly disorganized population."

Dr. Dyer is an authority on typhus fever, having established the fact that endemic typhus fever in the United States is spread by the rat flea, instead of the body louse which spreads European typhus. War, famine and civil revolutions are the conditions necessary for the kind of disorganization of populations that is the third factor required to fan typhus fever into a large epidemic. Famine certainly is not present in England nor, according to reports, in the Reich proper. War has failed to disorganize the population in England and there are no reliable reports of any such disorganization in Germany.

Steps must, of course, be taken and apparently are being taken to prevent the spread of typhus to the populations in England and Germany from soldiers returning from typhus fever areas and from war prisoners and refugees. Delousing is one effective measure of preventing its spread. It was extensively practiced among the armies on the Western Front in World War I. Troops in the trenches could be frequently relieved and sent to the rear for short periods for delousing. Such a procedure is not practical under conditions of open warfare.

Those who survive an attack of typhus fever are immune to the disease. This is believed to give the Russians some advantage at present, since large numbers of men in the Russian army now may have acquired immunity of typhus during the epidemic in Russia between 1917 and 1921. The Germans are not immune.

Vaccines against typhus fever have been developed, but so far none has proved satisfactory. One developed by Dr. Herald N. Cox. of the U. S. Public Health Service, is being tested in Bolivia.—JANE STAFFORD.

THE WESTINGHOUSE SUPER-POWER TESTING LABORATORY

ELECTRICAL knockout blows of 2,000,000 kilowatts, equal to twice the power generated at any instant at Niagara Falls, were rendered harmless by improved protective devices, at the first public demonstration of Westinghouse's new super-power testing laboratory.

In demonstrations before Army and Navy officers, these knockout blows duplicated the effects of a short circuit, such as could be caused by a bar of steel thrown across the electric circuits in a power station by a saboteur, the severance of a power line so that it would fall to the ground, explosives planted on the ground, or an aerial bomb.

The torrent of power suddenly released produced flaming arcs 20 feet in length, exploded old-time safety fuses with detonations as loud as shellfire, and shattered six-inch timbers into kindling wood. But a new 12-foot-tall improved oil circuit-breaker snuffed out the arc in a twentieth of a second and by-passed the current into a chamber where it was choked off with magnetic plates. Applied to a power line, the circuit-breaker cuts out a short-circuited section, allowing the remainder of the system to function normally.

In another demonstration, a compressed-air circuit-breaker blew out a 1,500,000-kilowatt arc in a hundredth of a second. In a room-sized refrigerator, where temperatures 20 degrees below zero can be maintained, an outdoor power switch, encrusted with frost and dangling with icicles, was tested. At 120,000 volts the current flashed over the four-foot-high porcelain insulators with a blinding light and a thundering crash. Experiments like this indicate how much insulation a winter-proof switch must have.

The power for the 2,000,000 kilowatt flash was built up gradually by two 500-ton generators and then released suddenly in a maximum time of five seconds. This power, which is equivalent to 2,680,000 horsepower, if it could be delivered continuously, would light enough fluorescent lamps to girdle the earth twice at the equator. The sudden release of this energy caused the generators to recoil like guns. Special spring mountings took up the shock to prevent injury to the foundations.

THE SULFA DRUG AND PERITONITIS

A NEW method of using a sulfa drug to save patients suffering from dangerous peritonitis is reported by Dr. Julius Gottesman and Dr. Harold Goldberg, of Sydenham Hospital, New York City, in the *Journal* of the American Medical Association.

The method consists of injecting the drug into the abdomen. Sulfa drugs have been put directly into the abdomen when it is opened at surgical operation or in war wounds, but this is believed to be the first time a sulfa drug has been injected into the abdomen when there was no wound.

The patient given this new type of treatment was a two and one half-year-old Negro child suffering from acute appendicitis with generalized peritonitis. Because of the child's condition, the doctors did not believe removal of the appendix was advisable. On the tenth day of the child's illness, the abdomen was punctured with a long needle something like a hypodermic needle and about half a pint of pus was withdrawn. Sulfathiazole was then injected through this aspirating needle. A

second injection was made two days later, and the child was also given injections of sulfathiazole into the veins as well as other treatment.

Two days after the second injection of sufathiazole into the abdomen the child's temperature fell to normal and its general condition showed definite improvement. Within three weeks it had recovered from the serious infection and was able to go home. Two months later another attack of acute appendicitis occurred and at that time the appendix was removed.

The method of injecting the sulfa drug directly into the abdomen could be of value not only in peritonitis from appendicitis, but also in peritonitis due to pneumonia germs, gonorrhea or streptococci.

DETECTOR OF METAL FRAGMENTS IN WOUNDS

PIECES of metal may now be removed from war casualties and victims of accidents with unprecedented facility and speed. The old method using probes and x-rays often takes one or more hours compared to the new record of a few minutes.

The revolutionary technique is based on the use of an instrument known as the Moorhead Foreign-Body Finder. By means of this guide surgeons may definitely locate bits of steel or other metals easily and quickly. The instrument was designed by Colonel John J. Moorhead, of the U. S. Army, professor of traumatic surgery at the Army Post Graduate School in New York City. It was used for the first time in Tripler Hospital, Schofield Barracks, after the Japanese raid at Pearl Harbor on December 7.

On the morning of the attack Colonel Moorhead—a visitor in Honolulu—was lecturing to a group of physicians. When the call came for medical help he accompanied the doctors to the army hospital. His instrument was used successfully that day to locate fragments in twenty cases and in many more to prove the absence of any imbedded metal. It consists of a radio frequency circuit mounted in a box, with a movable coil or capacity attached by a wire and inclosed in a steel finger, about half an inch in diameter and about twelve inches long, which is water-tight; the wire to which it is connected is covered with rubber so that it may be detached and sterilized by boiling. As the indicator approaches a piece of metal there is a deflection on a milliammeter. One knob of the instrument adjusts for iron fragments and another for other metals.

In use the indicator is passed above or around the wound in two planes at right angles to each other. At the points of greatest deflection marks are made on the flesh. The projection of these points indicates the position of the metal fragment. If this is not sufficient the indicator may be introduced directly into the wound, even in lung, brain or abdomen.

Colonel Moorhead's instrument has many advantages over the old method using x-rays. It cuts the time needed to remove the fragments to a mere fraction of that formerly required. The instrument is cheap to construct and operate and constitutes an enormous saving over that of the ordinary x-ray outfit. The machine is easily portable. The box is about one by one by two feet and weighs approximately ten pounds.

ITEMS

THAT tanks for the storage of gasoline and other volatile liquids, refineries and other vital structures can be made almost invisible to approaching enemy bombers by a new type of low visibility paint, has been announced by Paul L. Hexter, vice-president of the Arco Company, Cleveland. The new paint, although dark in color, has heat deflecting qualities approaching those of aluminum paint, hitherto widely used for keeping oil storage tanks cool, but now unsuitable because it makes these tanks shining targets that can be seen for many miles. To blend with the surroundings or for camouflage, the tanks can be painted green, tan, black or four intermediate shades. Already in use by the government, the paint meets Navy specifications for infra-red reflecting powers.

EVERY American community needs "a soundly conceived, adequately financed and ably executed dental health program," according to Dr. Lon W. Morrey, director of public education of the American Dental Association. Dr. Morrey spoke at the Second Pennsylvania Health Institute in session at Harrisburg. He pointed out that demands for dental health education have been growing for the past twenty years and that to-day the movement has expanded to forty-two state health departments which now have dental units.

A NEW plan which solves the problems of middle-aged and older patients and dentists alike was described by its originator, Dr. Elmer S. Best, of Minneapolis, at a meeting of the Second District Dental Society of New York State. Under the plan, the difficult dental diseases of middle-aged and older patients are treated on a yearly fee basis by middle-aged and older dentists who are the more experienced. Dental specialties, concerned with diseases of patients in this age group, are lumped under a new name, gerodontia. Dr. Best explained that the increasing number of persons sixty-five and older among the general population are particularly difficult dental patients. Their teeth are more brittle and false teeth need constant supervision.

THAT phosphorus for war uses will pour from two TVA plants, one already in operation at Muscle Shoals, the other to be set up immediately on the Gulf Coast near Mobile, Ala., if Congress acts promptly on a recent Presidential recommendation, was stated by David E. Lilienthal, TVA chairman, in a recent address. Combined capacity of the two plants will be 33,000 tons of elemental phosphorus a year. The Muscles Shoals plant has been in operation for several years, producing high-concentration phosphate fertilizers for use in the national soil restoration program. Relatively simple conversion now in progress will enable it to produce the pure element, whose war uses include incendiary bombs and concealing smokes. Burns from fragments of phosphorus bombs are disabling and slow to heal, but the white smoke produced by the burning element is harmless when breathed.