

SCIENCE NEWS

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RESEARCH IN PHARMACY

MEDICAL aid to war-time America may result from research work reported at the first session of the meeting of the American Pharmaceutical Association which opened at Denver on August 18.

Mercury in combination with saccharin, the sweetening agent, was prepared by Harry J. Pratt, Philadelphia, and J. Howard Graham, Glenside, Pa., and found to have superior qualities as a germicide.

New germ-killing substances were also reported by Dr. Milton Wruble, who combined silver compounds, long used in diseases of the ear, throat, and urinary passages, with the new sulfa drugs. Colloidal solutions of the creamy-white powder, silver sulfathiazole, were especially investigated and found to be efficient as well as less irritating to the eye and other delicate membranes, than many products now on the market.

A report from Oregon stated that ergot, the valuable drug used in childbirth and to prevent hemorrhage following delivery, was collected there and found to have two to four times the potency of the official standard. Discussion among the pharmacists gathered from every state in the nation indicated that research is going on in many parts of the country on this drug, which is a rye smut. Imports from Spain and Russia are practically non-existent and an acute shortage has been developing. One shipload that did make the hazardous journey was reported to be below the standard for these medicines in America.

The U. S. Plant Industry Office, the National Research Council, and the Committee on Botany and Pharmacognosy have, therefore, all requested investigation of domestic sources of ergot.

In the vitamin field, the application of a color method to find the amount of vitamin B₁ (thiamin) in pharmaceutical preparations was reported by Ernst R. Kirch, of Chicago, and Olaf Bergeim. The vitamin is reacted with a dye-like chemical and the color extracted with an alcohol. By determining the intensity of the color produced, the pharmaceutical chemist can calculate the amount of vitamin present.

MARRIAGE AND BIRTH RATES

MARRIAGE and birth rates, pushed to an all-time high by the war boom and the Selective Service Act, will hit a new low as soon as our full participation in this war is felt, was predicted by Dr. Philip M. Hauser, assistant director of the U. S. Census, at the Chicago meeting of the Society for Social Research.

With the death rate practically constant, last year's jump in the birth rate has brought U. S. population up to an estimated 133,039,000. Internal migration is increasing, with 1941 migration from farms to cities doubling that of 1940. This is expected to continue until the peak in war production is reached, including larger and larger percentages of women and Negroes as the labor shortage grows.

However, in the long run, according to Dr. Hauser, the

war will greatly decrease the rate of population growth. Since American economy has been built on anticipation of population increase, this may have serious economic consequences. Unless we succeed in successfully converting war production to consumer production, other post-war results will be depression and chronic migration of destitute workers, perpetuating the Dust-Bowl era on a larger scale. In any case we may expect a surplus of women following the war, says Dr. Hauser, which will create a class of women doomed to spinsterhood. Another dislocation in world population comes from the fact that this war is being fought by the "curtailed baby crop" of World War I. These "hollow classes" in the age pyramid of the nation will reappear in each generation, requiring many generations to erase.

However, post-war planners should study the effects of population as a cause of war, even more than the post-war effects on population, said Dr. Hauser. He hopes the settlement of World War II will recognize the danger of faulty distribution between population and natural resources, as the Treaty of Versailles did not.

HURRICANE DANGER

HURRICANE danger in Gulf and Caribbean regions is increased this year because of the radio silence imposed on ships at sea by the submarine menace. In pre-war times, reports of encounters with these violent storms gave warning of their approach long before they reached the land. Now, the only radio reports that can safely be made are those from the West Indian Islands.

With the number of Army camps, flying fields and Navy stations greatly increased in the South, and especially in Florida, the most exposed of all states to hurricanes, special precautions are being taken by military authorities, and particularly by the Red Cross, to guard against storm damage, and to be ready to move swiftly to the relief of any locality where a hurricane might strike. The civil population in the meantime is being advised to "get set" by putting houses, and especially roofs, into good repair, by laying in lumber and tools for boarding up windows if storm warning comes, and by preparing to store emergency supplies of drinking water, food, etc.

Hurricanes (and their China Sea counterparts, typhoons) could easily play a major part in the naval warfare now raging in all the tropic seas. While warships, even small craft like destroyers, are strongly enough built to battle their way through severe tropical storms, they can not possibly fight during one of them. Airplane carriers will remain afloat all right, but they can not launch their planes. The safest of all craft, during a hurricane, is a submarine. Even the most violent waves are not felt, a few fathoms down, so all that is needed is to dive and wait the storm out. Torpedo-damaged tankers, merchant ships or transports, trying to make port, on the other hand, will have their chances of survival gravely diminished. Ships in harbor are frequently in more danger during a hurricane than ships at sea.

Japan, and lands now held by the Japanese, are espe-

cially exposed, however, to typhoons. Hardly a year goes by without typhoon damage somewhere on the Japanese islands themselves.

By whatever name they are known—hurricanes in Caribbean-Gulf regions and in parts of the Pacific, typhoons in Far Eastern waters, cyclones in the northern Indian ocean—they are all the same kind of tropical storm. They are generated in the heated, stagnant belt of air near the equator known as the doldrums. Once in a while an area of this heated air starts rising like an enormous bubble from the bottom of a pot. The earth's rotation indirectly sets it spinning—and a hurricane is born. It drifts toward the west, and away from the equator, and may finally sweep up the whole eastern coast of this country, as did the New England hurricane of 1938, or even swing out over the North Atlantic and finally blow its last breath out over Britain and northwestern Europe. Typhoons follow similar courses, ravaging the coasts of China and the Japanese islands.

Hurricanes that reach the West Indies and our southern coasts vary greatly in number from season to season. A fair average is about half-a-dozen, coming any time between mid-June and mid-November, but mostly during late August and the whole of September. Last year no storms of hurricane violence were reported by the U. S. Weather Bureau. The biggest hurricane year on record was 1933, when a total of 26 such storms was noted. On several occasions during that season two hurricanes were active at once—a performance unheard of until then.

This year's hurricane record may never be known—certainly not until after the war. Emergency warnings will be given threatened areas, but these must not be mentioned in any way more than 150 miles from the localities concerned. Only if actual disaster occurs will news stories and pictures be cleared for publication elsewhere in the country. All that can be stated now is that there has been no hurricane of any kind on southeastern American or West Indian waters thus far in 1942.

SEA-BIRDS KILLED BY CONTACT WITH FLOATING OIL

U-BOATS claim thousands of victims never mentioned in the tragic lists of "missing at sea." They are aquatic birds—ducks, gulls and many others—that get their feathers soaked in oil set afloat from torpedoed ships (sometimes, too, from the fuel tanks of submarines destroyed in combat) and either sink from exhaustion or struggle ashore only to die in misery.

This distressing picture of suffering is presented by Roger T. Peterson, of the National Audubon Society, in *The Audubon Magazine*.

Normally, swimming birds' feathers, filmed with the birds' own natural body oil, keep their bodies warm and dry, no matter how cold the water they swim and dive in. But contact with mineral oil breaks this natural protection. Cold water reaches their skins, and if they do not die of chill and exhaustion, pneumonia is apt to set in. In any case, a badly oiled bird becomes unable to fly, and hence unable to seek its food. Oil slicks on the water are deceptive death-traps. To birds, weary of flying, they are likely to look like patches of smooth

water. Only when the luckless fowl has settled on one of them does it realize its mistake, and then it is too late. Sometimes, too, a duck will dive somewhere outside the boundary of an oil slick and come up in the midst of the oil. Then its doom is sealed in a most literal fashion.

Sea birds have only minor importance as food, but they have more than esthetic significance in other ways. Gulls and some of their relatives are natural garbage incinerators, and do much to keep down the amount of rubbish on our water fronts. Eider ducks are prized for the light, warm down collected from their nests and used in making quilted jackets for aviators, seamen and others exposed to severe weather. Several thousands of these ducks have been oil-killed on Nova Scotia coasts alone.

Little can be done for oil-soaked birds. If they are really badly oiled, the most merciful thing is simply to make a quick end of their pain. Less severely oiled individual birds can be freed from the black contamination by careful treatment of their feathers with salad oil; but obviously that can not be done for more than a few out of the many thousands of seafowl.

THE RATE OF VIBRATION OF PLASTICS

AUTOMATIC machines bend plastic materials back and forth at speeds ranging from a slow wave to a singing vibration to test their fitness for airplane parts and for other uses subject to vibration.

When the specimen breaks, the machine automatically stops and the number of vibrations administered up to the moment of the break is recorded. An important result of the tests was the disclosure that the rate of vibration has an important influence on the number that can be withstood.

These and other tests on plastics have been carried out for the past two and a half years at the University of Illinois under the direction of William M. Findley, backed by more than twenty-five years experience of the engineering staff in putting metals through similar tests. The results are used by the American Society for Testing Materials to designate standard methods of testing plastics.

In another test, specimens hang along a wall of the laboratory with weights attached, and the stretch or "creep" is measured with microscopic fineness for periods of time from a day up to as much as a year.

These long-time "fatigue" or endurance tests are of extreme importance for the safety of our fighting men and civilian workers, for a piece will fail under oft-repeated or long-continued stresses much smaller than it could withstand for a short time. It is necessary to know how long a piece can be used or abused.

SUBSTITUTES FOR SHOE LEATHER

ALTHOUGH the leather supply is still adequate for shoes, particularly women's shoes, this situation may be reversed at any time due to government requirements for our own and allied war needs. For this reason, the National Bureau of Standards is busy experimenting with leather substitutes. Since the greatest shortage is to be expected in sole leather, most of the experimentation has been with non-leather soles.

The vogue for "wooden shoes," copied from leatherless Paris, has so far been confined to flat wooden soles on beach shoes, which make an interesting clatter on boardwalks, or to street soles which are hinged with leather for flexibility and padded for silence.

While some Washington shoe experts consider wood the best alternative to a leather sole, Everett L. Wallace, chief of the leather section of the Bureau of Standards, believes that present experiments will produce even better substitutes. Shoes are now being sold with thin leather soles covered with a layer of Vinylite or similar synthetic. These soles are said to have worn so well on children's shoes that the college girls have adopted them for active sports.

The biggest problem in adapting these plastics to the upper part of a shoe, according to Mr. Wallace, is their lack of porosity—that porous virtue of leather which "allows the foot to breathe" by absorbing perspiration. Waterproof synthetics are usually combined with more porous fabrics in women's shoes. However, other substitutes are being worked out which it is hoped will combine wearing quality with porosity. "Laminated" cotton fabrics are one solution—that is, alternating layers of cotton with layers of some synthetic material. A substitute named "Thiokol" looked like the perfect answer for a while, said Mr. Wallace, until its persistently bad odor caused complaints.

Men in civilian life would be more affected than women by any shortage of the heavier leathers needed by the Government, as well as by any shortage of the chemicals used in tanning. Therefore the new WPB ruling which requires more oil to be used in finishing sole leather is good news. Increasing the oil content from three per cent. to five per cent, is expected to result in a ten per cent. to fifteen per cent. increase in wear, because of oil's resistance to dampness. Since tanners have no way of knowing which hides will make shoes for the Government, and which for civilians, they are apt to treat all the heavier leather, at least, to meet Federal specifications. And that means longer wear for many of the shoes we buy a few months from now, including women's heavy walking shoes.—MARJORY ESTABROOK.

ITEMS

THE mass of the moon is now found to be $1/81.271$ of the earth's mass instead of $1/81.56$, as previously supposed. The probable error is plus or minus 0.021. The latest figure was calculated by Dr. H. Spencer Jones, Astronomer Royal of England. It is a by-product of his discovery last year that the mean distance of the sun from the earth is 93,003,000 miles instead of the previously accepted value of 92,870,000 miles. Both these results are based on observations on the planetoid Eros at its close approach to the earth in 1931. Unsettled conditions in the world and the resulting wars prevented earlier completion of the calculations. Despite the nearness of the moon, its mass is one of the most difficult astronomical measurements to make. It is done by determining the position of the center of gravity of the earth-moon pair. Then, as though they were two bodies attached to a stick balanced at this point, their relative

masses are proportional inversely to their distances from the supporting point or center of gravity.

NEW light is thrown on electricity and life processes by researches of Professor Harold S. Burr, of Yale University, who simultaneously took motion pictures and electrical records from growing corn plants. His results are set forth in detail in the new issue of the *Yale Journal of Biology and Medicine*. It had been known for some time that all living things give off minute electrical currents, but Professor Burr's experiments have shown for the first time that these variations in intensity correspond exactly with changes in the rate of growth, and with internal structural developments. Voltages as measured were low—from 25 to 75 thousandths of a volt. Some of the changes detected by the delicate instrumental set-up were quite abrupt. The more rapid fluctuations in plants, accompanying internal changes, are stated to be "curiously like brain waves in animals."

DR. A. L. KROEBER and Frank Essene, of the University of California, have found two living members of the Lassik, an Indian tribe thought extinct many years ago. They are both women, named Lucy Young and Mary Major, and they are living with Indians of other tribes on the Round Valley Reservation in Mendocino County. There is no doubt, however, according to Dr. Kroeber and Mr. Essene, that they are of the "vanished" Lassik tribe. Lucy Young is about ninety years old, and is possibly the oldest Indian in the state. Certainly she is the only one left in Mendocino County who can tell of the ways of her people before they made contact with white men. Discovery of these two Indian women makes possible the recording of ancient tribal culture patterns long since given up for lost.

A NEW greaseless cream, which applied to a worker's hands, arms and under the nails, protects them from grime and some irritating substances, has been announced by E. I. du Pont de Nemours and Company. The new cream is not medicinal, but forms an invisible protective film which at the end of the day can be washed off with soap and water, carrying the grime with it. Skin disorders comprise two thirds of all occupational diseases, according to the statistics of one major insurance company, and newcomers whose hands are not yet hardened are especially susceptible to them.

THE hairy Ainu of the northern island of Japan are not very closely related to the white peoples of Western lands, according to studies received at the Smithsonian Institution of L. Stenberg, the Russian anthropologist. Instead, they belong to a general "Caucasoid" complex shared with various peoples of southern Asia and Indonesia. They may even have some vague relationship to the bearded black natives of Australia, despite an almost exactly opposite difference in skin color. The Ainu, who contrast sharply with the Mongolian race in their general hairiness and especially in their long beards, live very primitively in the small area into which they are crowded. Despite their northern location, they keep many of the habits of a southern, seafaring people.