SCIENCE NEWS

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THE IMPORTANCE OF REST PERIODS

REST periods are vital to war production. This is stressed by the War Department, the Navy Department, the War Manpower Commission, the War Production Board and four other Government agencies in recommendations to war contractors.

America is at war and the ordinary leisurely summertime vacations are naturally out for the duration just as touring and sightseeing are out. There can be no slacking of production, no relaxing of speed, no shutdown of any department that is needed in war production. But rest periods are important for each war worker. They should be carefully planned over the whole year or the longest possible period. In this way fresh, rested reinforcements are constantly being brought into service on the production front. Each day should have its rest periods. A 30-minute period for lunch is recommended by the Government departments. In occupations that involve contact with poisonous substances, workers must also be allowed time to wash up before lunch.

Industrial psychologists have found that the amount of rest and the frequency of the periods required for peak efficiency depends a great deal on the type of work being done. It should be carefully planned for each sort of job in a plant. In some work a compulsory ten-minute rest interval every two hours is best. In other types of work, it may be best to allow each individual to select his own time to take such a short rest period when he feels fatigued. According to the statement of the Government officials, "One scheduled day of rest for the individual, approximately every seven, should be a universal and invariable rule."

This does not mean any shut-down on Sunday. Plants and tools should be kept busy all around the clock and all around the calendar. But for the individual, a 7-day work week is injurious to health, to production and to morale, the statement emphasizes. Only in extreme emergencies should either workers or supervisors go without the weekly day of rest. Then it must be only for a limited time.

Psychologists would point out that this is even more important for the executive who does not need to punch a time clock than it is for the routine worker. The psychological effects of fatigue are insidious and treacherous. Enthusiasm for the war program and eagerness to do the job may keep an executive at his desk long hours and he may skip his weekly game of golf and his Sunday off. For a while that speeds the work. But after a while it becomes a little more difficult for him to make quick and sure decisions. Even more disastrous, against his will a sort of staleness may creep into his thinking. No longer is he eager to be at the job. No longer is he so sure of success.

British medical officers found that soldiers who have to make split-second judgments and keep up the fire of enthusiasm for their vital work must be forced to take rest periods—not just to avoid crack-up, but to stay in top-form vigorous spirit.

The announcement of policy of the U. S. Government officials emphasizes that the wise conservation of human resources and the protection of working efficiency and morale is equally vital on the home front.—MARJORIE VAN DE WATER.

THE PRONUNCIATION OF STAR AND CONSTELLATION NAMES

YEARS of confusion in pronouncing astronomical names may now come to an end. Often when referring to a star or constellation that he used in navigating his craft through the air or over the sea, the aviator or mariner has given the name such an unfamiliar twist that the astronomer has had to think twice to realize the object meant. Now, however, the American Astronomical Society has adopted officially a new list of pronunciations.

Prepared after consultation with teachers and others interested by a committee consisting of Dr. Samuel G. Barton, of the Flower Observatory of the University of Pennsylvania, *chairman;* George A. Davis, Jr., of the Buffalo Museum of Science, and Daniel J. McHugh, C.M., of De Paul University, Chicago, the complete list appears in *Popular Astronomy* for August. It includes the 88 constellations used by astronomers, fifty important special star names, the nine major planets, three clusters of stars and the letters of the Greek alphabet. The latter are often used by astronomers. Thus, the brightest star in the constellation of Orion is called alpha Orionis.

The special name for this star is "Betelgeuse," but it has had a variety of pronunciations, even in astronomical circles. One is *bet*-el-gerz, another beh-*tell*-gyou-eez and another "beetle-juice." The committee decided on *bet*-ul-jyuz. The first syllable is accented. The second syllable is pronounced like the el in "angel," and the u in the third syllable has the same sound as in "emulate."

The bright star Aldebaran in the constellation of Taurus the bull, which, like Orion, is seen to the south on winter evenings, is often called al-deh-*ba*-run by navigators. The last two syllables are pronounced the same as "baron." Dr. Barton's committee adopted al-*deb*-a run. The third syllable is pronounced like the a in "abound" and the last like the a in "sylvan."

For Cassiopeia, the W-shaped constellation seen in the northeast these August evenings, *kass*-ee-*ope*-ee-yuh has often been used, but they recommend *kass*-ih-oh-*pee*-yuh. The a in the first syllable is like that in "hat," the i in the second as in "bit," the o in the third as in "anatomy," the e in the fourth as in "be" and the a at the end as in "sofa." The first and fourth syllables are accented.

Planet names are also covered. Most of these are familiar, but Uranus has been subject to variation. Thus, you-*ran*-us is sometimes used. Now, it has been decided, this should be *u*-ra-nus. The a in the second

syllable is as in "abode" and the u in the last like that in "circus."—JAMES STOKLEY.

SPLIT HEVEA SEEDLINGS

MAKING two rubber trees grow where only one grew before, by splitting Hevea seedlings just after they have sprouted, is the newest step toward the solution of the natural rubber problem reported by scientists of the U. S. Department of Agriculture. The technique offers the possibility of doubling the yield from the limited, therefore doubly precious, supply of high-quality pedigreed seeds available for the establishment of rubber plantings in the Western Hemisphere tropics.

Hevea seedling-splitting was first developed by Dutch plant scientists, working on the great plantations of the Netherlands Indies. Their methods have been tried out, with variations that may produce improvements, by H. F. Loomis, of the Bureau of Plant Industry, at the U. S. Plant Introduction Garden at Coconut Grove, Florida.

Seedling-splitting in Hevea depends on the early growth habit of the plant. The rubber-tree seed looks like an oversize castor bean—Hevea is, as a matter of fact, a botanical relative of the castor bean. Only, when sprouting takes place, the thick seed-leaves or cotyledons are not pulled out of the seed-coat but remain in it, feeding the young plant for a time through the leaf-stems still attached to the shoot.

The first method of multiplying rubber plants by dividing them consisted simply of splitting the whole seedling into equal halves, from shoot-tip to roots, a few days after germination. The split halves of the shoot soon died, but new shoots came from a pair of tiny buds in the angles between the seed-leaf stems and the original shoot. This method, first described by a Dutch botanist named J. C. Zweede, was called the Ramaer method, after the botanist who invented it, R. Ramaer.

Later, an improvement was made on it by another botanist, but it was named not for a person but for a plantation, the Gambar Estate, near Malang, Java. In the Gambar method, the split is not into equal halves, but the cut is made into the side of the shoot, just above the junction with the seed-leaf stems. This leaves the original shoot to grow up, while a new one forms from the bud on the "short" side of the cut. This gives quicker growth to one side, because the original shoot does not die as it does in the Gambar method. The new shoot that forms on the other side grows just about as well as it does under the Gambar technique.

In both methods, the split seedling halves are still "siamesed" together by their attachment to the seed-leaves held firmly within the seed-coat. They grow side by side in flower-pots until they are big enough to separate and set out separately.

In an effort to eliminate this operation, Mr. Loomis tried carefully cracking the seed-coat and separating the seed-leaves at the time of the splitting. This eliminated the labor of later re-potting, but this saving was offset by the death of some of the seedlings.

Mr. Loomis also discovered that young seedlings growing in the open, with their tops killed by cold or eaten off by rabbits, could be split and replanted successfully after they had started new shoots from the side buds. Studies on this method, however, have been very few, and must be carried further before any recommendations as to possible practical application can be made.

SHARK LIVER OIL

SHARK fishing off the South Florida East Coast has been catapulted from a more or less despised calling to a vital defense industry. The reason is the urgent demand for shark liver oil, which is particularly rich in vitamins A and D. Shark liver oil is largely replacing Norwegian cod liver oil, now impossible to import.

Salerno, on Manatee Creek, up St. Lucie River, is the center of the revived and now flourishing shark industry. The sharks are caught on mile-long chain trot lines, baited with chunks of coarse fish every 25 feet, set on the edge of the Gulf Stream bottom and left overnight. The ends of the line are anchored and marked with buoys. Hauled to the surface the next morning by winches, the sharks are clubbed, brought to port and flayed. The livers are boiled for the oil, which is barrelled and shipped to Northern extracting plants. A shark's liver produces anywhere from two to 25 gallons of oil.

Varieties of the savage, cold-eyed scavengers of the sea, plentiful five miles off St. Lucie Inlet, include the nurse shark, hammerhead, tiger shark, leopard shark, lemon shark, mackerel shark and the great white shark. Sharks weighing up to and over 1,500 pounds, have been caught by the Salerno commercial fishermen. The average length is seven feet. The big fellows are the ones that got away, breaking the stout chain lines that held the three-quarter-ton "babies."

Sharks are processed as thoroughly as any pig in the Chicago stockyards. The skin is pickled in brine and goes to Newark, N. J., to be made into novelties and into a scuff-proof leather for the toe-caps of heavy working and hunting shoes. The fins find their way to the country's many Chinatowns for soup, and fetch a high price since the so-called delicacy can no longer be imported from Shanghai and Hong Kong; the flesh is chopped up for dog and poultry food and fertilizer; the jaws and teeth are sold for souvenirs; the backbones are made into walking sticks; and the eyes are dried, crystallized and polished as jewels for the novelty trade—now largely confined to men in khaki stationed in Florida.

Shark fishing is not without its dangers. Men have been caught on empty hooks, dragged overboard and drowned. Sudden tropical storms have sunk more than one shark boat. And now that German U-boats have commenced to machine-gun fishing boats the men of Salerno have another hazard to face.

But new boats nevertheless are being outfitted to go after the sharks. Shark liver oil is now as valuable and as sorely needed as rubber or tin.—J. HERBERT DUCKWORTH.

PREVENTABLE DISEASE OF ANIMALS

IF a farmer lets his animals die of a preventable disease, there's a certain anti-social stigma attaching to such neglect. A man may own his animals, but he's under implied obligation to deliver them or their products in

good condition for the use of our armed forces, our working forces on the home front, our allies on the world's far-flung battle lines.

That letting diseases or parasites do damage unchecked is giving license to a ceaselessly active mob of saboteurs that even in spite of our best efforts still do American livestock well over $400,000,000 worth of damage every year, is pointed out in the 1942 Yearbook of the U. S. Department of Agriculture which has now appeared.

Nor is the cash loss the only thing involved. Gove Hambidge, editor of the Yearbook, points out that diseased animals readily communicate some of their worst ills to human beings: anthrax, brucellosis, glanders, horse sleeping sickness, trichinae, tuberculosis, rabies and a whole medical chamber of horrors besides. Human beings in this country don't get foot-and-mouth infection because the eternal vigilance of the Bureau of Animal Industry has thus far stamped out every outbreak of this terrible plague of hoofed animals that has occurred within our borders.

The new Yearbook, titled "Keeping Livestock Healthy," is devoted entirely to problems of animal diseases and parasites. With a foreward under the slogan "Keep 'Em Healthy!" by Secretary of Agriculture Claude R. Wickard, the 1,238 pages are filled with 98 articles by eleven investigators headed by Dr. John R. Mohler, chief of the Bureau of Animal Industry.

Although the book takes up farm-animal diseases one by one, and animal by animal, it does not undertake to set up every farmer as his own veterinary. On the contrary, its aim is to enable the farmer to avoid need for calling the "vet" quite so often, especially since war needs have drawn off a large section of that none-too-numerous profession and the ones still available have to be "spread thin" and made to go as far as possible.

The 1942 Yearbook of Agriculture is the seventh, and regrettably the last, of a notable series edited by Gove Hambidge. Since the 1936 volume, each Yearbook has been devoted to one special subject: genetics, soils, food, climate, etc. Each has thus become a first-class reference book, unique in the agricultural literature of any language. The "economy" impulse of a Congress that cut off the Yearbook appropriation (while continuing to fatten the Congressional Record and frank it out by carloads) is much to be deplored.—FRANK THONE.

ITEMS

THE U. S. Department of Agriculture is trying to get stands of cork oaks, from whose bark cork is made, established in this country. But first, they have to learn where the trees will grow well. California is a known possibility, but there should be other places. It is requested that any one who knows of a really authentic cork oak, or a source of cork-oak acorns, to write in about it. Cork has become one of our severe wartime lacks. The only places where cork oaks grew in real numbers are the uplands of Spain, Portugal and North Africa.

SCIENTIFIC information and documents are being sent back and forth across the Atlantic in the form of microfilm—miniature photographs that may be read by enlargement—in order to speed the mutual war effort of Britain and the United States. According to a statement made by Professor A. V. Hill, secretary of the Royal Society, the use of microfilm for scientific purposes began in the country in 1937 when literature in libraries was reproduced in this way for research workers. Regular scientific collaboration between American and British scientists has now been arranged with liaison officers in both capitals and other research centers. Experts are also ferried by air from one country to the other.

QUININE substitutes which will be official in the new U. S. Pharmacopoeia have been announced ahead of schedule, together with standards for their preparation because of the urgent need for protecting our overseas forces against malaria. Due to the present shortage of quinine, two synthetics, pamaquine naphthoate and quinacrine hydrochloride, may be of special value in keeping our armed forces free from the disabling periodic fever. Hearings are now under way in Congress on quinacrine patents which are alleged to restrict production. Totaquine, another anti-malarial, will also be in the new official book of drugs. This contains the familiar quinine but is mixed with several other related substances also found in the cinchona barks. It is expected that this mixture can be obtained from native cinchona barks found in Mexico and Central and South America instead of our former source in Japanese-held territory in the Far East.

BUTTER for troops in the tropics is practicable without the elaborate and costly refrigeration mechanisms that now make it such a problem. It can be "assembled" out of two milk constituents, butteroil and skim milk powder, has been demonstrated by Charles S. Trimble, of the Bureau of Dairy Industry, U. S. Department of Agriculture. Powdered skim milk and water are stirred into the butteroil, and the emulsion is poured slowly into cold water. Butter granules are formed, and may be worked into butter in the usual way. Butteroil is a clarified form of butterfat, which has been used in India for generations, under the name of "ghee." It also has some use in other dairy countries, notably Sweden and Switzerland. Butteroil can be kept from spoiling in hot climates by packing in airtight containers with all oxygen excluded. Dr. George E. Holm has developed a practical method for packing butteroil so that it will keep. At present, tin or other metal containers are used, but research is now under way to test the possible use of wooden kegs.

ADDITIONAL evidence that diabetic patients treated with a daily dose of the protamine zinc form of insulin may continue to excrete sugar and still remain in good health, is reported in the *Journal* of the American Medical Association. Large doses of insulin administered in severe cases to prevent excessive amounts of sugar in the kidney excretion, often result in alarming illness due to reactions from the treatment. But after careful study, Dr. Edward Tolstoi and his associates suggest that the daily dose of protamine zinc insulin without too much regard for sugar level in the body fluids often results in loss of other diabetic symptoms, maintenance of weight and satisfactory control of the disease.