SCIENCE NEWS

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RED STARS

A LARGE number of red stars, of the peculiar M type are imbedded in atmospheres of titanium oxide gas, is reported by Dr. Oliver J. Lee, director of Dearborn Observatory of Northwestern University, who has studied the problem during the past twelve years with the assistance of Ralph B. Baldwin, David W. Hamlin, and Richard F. Kinnaird. Approximately 85 per cent. of these red stars listed in Volume V of the "Annals of Dearborn Observatory" are relatively faint and have not previously been analyzed.

The M type stars are peculiar in that they are more numerous proportionally in the direction of the constellations Scorpio and Sagittarius, the center of our galactic system. This is in marked contrast to stars of the R and N type which are surrounded by an envelope of gaseous carbon, for they cluster notably in the opposite part of the sky in the direction of the constellation Orion.

Dr. Lee points out that "in view of the oft-repeated statement that a large proportion of advanced M stars are variable, it was reasonable to expect that a considerable number of new long-period variables would be found. We did not find half a dozen, although it would have been easy to detect a change of one or two magnitudes in brightness."

The study which Dr. Lee and his assistants have been making is hoped to throw light on the problem of how stars are born and what becomes of them when their internal energies have exhausted themselves. Observations of faint red stars will continue at Dearborn Observatory, and it is hoped eventually to complete a spectrographic survey of the whole sky, classifying all faint red stars up to a magnitude of 11.5.

RADIO STATION OF THE NATIONAL BUREAU OF STANDARDS

A NEW, more powerful radio station has been opened by the National Bureau of Standards in Washington. No one will be able to tune in for entertaining programs, however, for its broadcasts are limited to ticks, hums and whistles which set the frequency standards for technical men in many industries.

The service has now been extended so that good reception is possible throughout the United States, the North Atlantic Ocean and, with fair reception, over most of the world. Broadcasts will be continuous night and day on five, ten and fifteen thousand kilocycles.

The radio and audio frequencies serve as standards used by radio engineers of the armed forces, commercial stations and radio industry. It is by the National Bureau of Standards broadcasts that a station periodically checks to make sure that broadcasts are on the frequency prescribed by law and that the programs will come in where the listener expects them to be.

One of the audio frequencies used, 440 cycles per second, is the standard musical pitch corresponding to A above middle C. It is used by all musical instrument manufacturers, and many piano technicians and musicians. The broadcasts are helping to set up a uniform standard; for there has been some difference of opinion as to what the tone A really is.

Besides these frequencies there is a pulse every second heard as a faint tick when listening to the broadcast. These may be used as accurate time signals and their one-second spacing permits scientists to make accurate physical measurements.

Error of less than one part in 10,000,000 is the average accuracy standard maintained for all frequency broadcasts.

PROSPECTING FOR RADIUM ORE

PROSPECTING for radium ore with an "electrical detective" has proved practicable and the instrument may be adapted for sorting and grading radioactive material after it is mined. A portable adaptation of the Geiger-Muller counter, an instrument ordinarily used in the laboratory to detect and count ionizing particles, has been designed for prospecting by Dr. G. L. Locher of the Bartol Research Foundation, Swarthmore, Pa.

It was turned over to G. Carman Ridland, formerly resident geologist for Bear Exploration and Radium, Ltd., in Canada, who gives the results of his work in a report to the American Institute of Mining and Metallurgical Engineers, as follows.

"The results obtained with the Geiger-Muller counter at Great Bear Lake demonstrate that the instrument can be of value in the search for radioactive ore." He believes that the counter is "not only adaptable to the detailed search for radioactive ore bodies in established radioactive territories, but could, and should, be used by prospectors and members of federal geological survey parties in their aerial reconnaisances of large, unexplored regions."

Mr. Ridland surveyed areas at Contact Lake in Canada where pitchblende veins, source of radium and uranium, had been encountered during silver mining. By detecting abnormally high numbers of gamma rays shooting from the rocks, Mr. Ridland found several areas which warranted definite exploration programs.

Each ray entering the counter is translated by the instrument into a click which the operator hears in earphones. Since the instrument is also sensitive to the cosmic rays reaching the earth from outer space, a correction must be made for the background of clicks heard due to the cosmic rays.

THE PRODUCTION OF SYNTHETIC RUBBER

IMPROVED synthetic rubber production through use of an electronic "chemist" to analyze the complicated gases formed in making butadiene has been announced by Dr. John A. Hipple, physicist at the Westinghouse Research Laboratories, who in cooperation with technical men from the industries involved, adapted the instrument, called a mass spectrometer, for its new war job.

"In 15 minutes," Dr. Hipple explained, "this spectrometer will dissect a complicated gas molecule a twenty-five-millionth of an inch long and can be arranged to automatically produce an autograph that tells the chemist the composition of the gas. At present certain analyses require from 15 hours to three days of painstaking laboratory work by five to ten skilled chemists—others can not be done at all even by other processes. Results attained by these tedious methods are much less accurate than the molecular 'portrait' that comes out of the spectrometer."

As butadiene molecules are built up in the chemical plant, their composition must be checked at intervals to make sure the correct structure is being obtained. An error in molecular design would result in poor quality synthetic rubber.

Present methods are sometimes so slow that the batch of butadiene has gone through the various steps of processing before the check analysis is completed. Thus, under the old method, a batch of butadiene may have to be reprocessed, causing lost production time.

TROPICAL PLANTS

IF you should get lost in the jungle, after a forced plane landing or a shipwreck, and have to live off the country while you find your way out, hunt for plants that look like the ones you knew back home. This is one hint offered for the benefit of "bushed" soldiers and sailors by Dr. E. D. Merrill, of Harvard University, administrator of its extensive plant collections, who spoke on August 14 over the Columbia Broadcasting System in Science Service's Adventures in Science program. Dr. Merrill is the author of the first government-sponsored manual on emergency foods, entitled "Emergency Food Plants and Poisonous Plants of the Islands of the Pacific."

"In the tropics, as elsewhere," stated Dr. Merrill, "one may eat all types of animals and birds that can be captured, including lizards, snakes, rodents, monkeys, bats, parrots and even locusts." Dr. Merrill spoke from experience, for he has tried them all on occasion.

Certain natural groups of plants growing both in the United States and the tropics have definite family characteristics. In the rose family, there are practically no poisonous plants. In the large bean family, on the contrary, some species make excellent food while the seeds of others are very poisonous. The emergency food manual is designed to give men with no knowledge of botany the information needed to make a proper selection. The tender central bud of most species of palms, the so-called palm cabbage, may be eaten either raw or cooked. Other palms, such as the sago, sugar palm, talipot, and fishtail palm, store up immense quantities of starch in their trunks, which can be extracted and used for food. Many members of the calla-lily family have fleshy roots which may be eaten provided you know how to eliminate the microscopic stinging crystals that make these plants intensely irritating when eaten raw. In general, the tender, uncurling leaves of ferns may be safely eaten. Young bamboo shoots also are excellent.

Dr. Merrill first became interested in economic botany when a small party of which he was a member was left on a remote island and the entire party existed on the unexciting diet of boiled rice three times a day for a week. Since then, experimenting with native foods has been his hobby.

ITEMS

THE U. S. Public Health Service has received funds from the W. K. Kellogg Foundation for sixteen additional fellowships in health education. Each fellowship carries a monthly stipend of $100 for twelve months plus tuition and leads to a Master's Degree in Public Health. Studies may be pursued at Michigan and Yale in addition to the University of North Carolina, where 20 fellows are already training. The object of these fellowships is to train health educators to meet the present shortage of such personnel and an anticipated demand in the future in both this country and abroad. Placement after training is anticipated. The new fellows will start their training with the fall term at the respective universities. Applications and other pertinent material must be in the office of the Surgeon General, U. S. Public Health Service, Washington, D. C., on or before September 4.

DISCOVERY, apparently for the first time on record, of a dog with two brains was made at the laboratories of the Health Department of the District of Columbia. Dr. John E. Noble, director, thought someone was playing a joke on him when first told of the discovery. The two brains in one head were discovered in a collie of mixed type, but no unusual appearance, by J. B. Holland. Mr. Holland was examining the dog's brain for rabies when he found the second, smaller brain behind the first, but also attached to the dog's spinal cord. Evidence of rabies was found in both brains. Authorities at the Bureau of Animal Industry, stated that they had never heard of such an anomaly before. Two-headed calves, five-legged animals and humans with an extra thumb or finger, yes; but a two-brained dog is apparently something new in the records. Dr. Noble suggests that there may be more such which never are discovered because, luckily, they fail to get rabies and have their brains examined after death. By the time the discovery of the second brain was made and verified, both had been handled too much to make it possible to preserve them as museum specimens.

FRUIT jars for home and factory canning may be covered and sealed by what seemingly is a device never before used. It is called a "side seal glass closure" and was developed by the Hartford-Empire Company, a manufacturer of glass machinery located in Hartford, Conn. The company is offering the design of this new glass closure freely to the industry as a contribution to the war effort. A pliable plastic material is used as a gasket to fit around and slightly above the top of the jar. When rubber becomes plentiful again, either natural or synthetic rubber gaskets may be used instead of the plastic. The rim of the glass cover is slightly bevelled on the inside. When the cover is placed over the jar and gasket and firmly pressed, it compresses the gasket and causes the projecting upper edge of it to mold itself over the top edges of the jar. Glass does not touch glass at any spot. The seal is perfect. The top is easily pried off when the jar is to be opened.