SCIENCE NOTES AND NEWS

The Green Bee Eater as Predator of the Desert Locust

Shri Charan Singh (Locust Warning Officer, Churu, Rajasthan) writes that he often observed the Green Bee Eater (*Merops orientalis*, Latham.) feeding on adults and hoppers of the desert locust (*Schistocerca gregaria*, Forsk.)in Bikaner and Sri Ganganagar districts of Rajasthan from 1953-56. On the 20th August 1958 during the course of locust survey it was observed at Rajasar Village of Churu District that a Green Bee Eater followed an individual of the desert locust adult high in the sky upto the height of 800 feet with great agility and returned to its perch with prey which was devoured. The object of this note is to record an important predator of the desert locust, in Rajasthan, in addition to the birds listed by Husain and Bhalla (1931).

Control of Fruit Drop in Mango

Messrs. K. Kirpal Singh, Sucha Singh and Krishna Lal Chadha report from Panjab that fruit drop in mango could be controlled by spray treatment with the plant growth regulators alphanaphthaleneacetic acid (NAA) and 2, 4-dichlorophenoxy-acetic acid (2, 4–D). The treatments were tried on Fajri mangoes on May 15, six weeks after full bloom. NAA at 30 and 40 p.p.m. in water gave the best control of fruit drop registering only 22% fruit-fall between May 15 and July 18 as compared with 52% in control during the same period. Application of 2, 4-D at 10 p.p.m. gave a fruit drop of about 28% and further increase in its concentration showed no better control.

Both the growth substances influenced fruit quality by increasing fruit size, titratable acidity and ascorbic acid content, and suppressed to a great extent, the oozing out of sap from the pedicel which commonly blemished the surface of untreated fruits. Some treated fruits also exhibited a red blush on yellow ground near maturity as against the normal green colouration of the ripe fruit in this variety.

Fifth Congress on Theoretical and Applied Mechanics

The above Congress will be held under the Presidentship of Dr. A. N. Khosla, Vice-Chancellor, University of Roorkee, from December 23 to 26, 1959, at the University of Roorkee, Roorkee.

Research Papers may be contributed on any of the following topics : (1) Elasticity—Plasticity—Rheology, (2) Fluid Mechanics, (3) Mechanics of Solids, (4) Statistical Mechanics—Thermodynamics—Heat Transfer, (5) Mathematics of Physics, Statistics and Computation, (6) Experimental Techniques, and should reach the Secretary-Treasurer with three copies of their abstracts before October 15, 1959.

There will be invited addresses of one-half hour each on special topics. The Registration Fee for the Congress is Rs. 10·00 which should be sent to the Secretary-Treasurer at Kharagpur.

The Congress will be preceded by a Symposium on 'Non-linear Physical Problems' under the joint sponsorship of the Indian Society of Theoretical and Applied Mechanics and UNESCO, on December 21 and 22, 1959. Invitations are being extended to foreign and Indian participants.

Application Forms for registration and any other information may be obtained from the Secretary-Treasurer, Dr. B. R. Seth, Indian Institute of Technology, Kharagpur.

Award of Research Degree

Andhra University has awarded the D.Sc. Degree in Physics to Shri H. S. Rama Rao for his thesis entitled "Ultrasonic Studies in Liquid Media", the D.Sc. Degree in Botany to Smt. H. Maheswari Devi for her thesis entitled "Embryological Studies in Compositæ and Gentianales" and the D.Sc. Degree in Geology to Shri B. B. G. Sarma for his thesis entitled "Studies on Depositional Environments of Some Sedimentary Formations".

Osmania University has awarded the Ph.D. Degree in Chemical Technology to Shri B. V. S. Subba Rao for his thesis entitled "Studies on Thermal Decomposition of Limestones" and the Ph.D. Degree in Chemistry to Shri R. Kurdukar for his thesis entitled "Search for New Insecticides : Synthesis of Some Substituted Xanthones, etc."

The University of Madras has awarded the Ph.D. Degree in Chemistry to Miss Roshan J. Irani for her thesis "Carbohydrate Constituents and Sugar Metabolism of *penicillium chrysogenum*". Miss Irani worked under Dr. K. Ganapathi in the Hindustan Antibiotics, Pimpri.

Weather Balloon Altitude Record

An experimental weather balloon of the U.S. Army, launched on February 11, 1959, reached a height of 1,46,000 ft (about 28 miles). The balloon was made of a new synthetic neoprene compound resistant to tears, extreme temperatures and the intense sunlight. During the flight which took two hours the balloon expanded from a diameter of 10 ft. to one of 65 ft. It carried a radio-equipped package containing weather instruments and a special type of altitude meter. The instruments recorded a low temperature of — 85° F. at an altitude of 10 miles. At higher altitudes, the radio signals revealed a warming trend reaching 45° F. at the record height.— [*Bull. Am. Met. Soc.*, 1959, 40 (5), 262].

Vanguard I Photographed

The Smithsonian Optical Tracking Station at Woomera, Australia, has successfully photographed the Vanguard I earth satellite at the apogee of its orbit, nearly 2,500 miles from the earth. No other object as small as this 6-inch sphere has been photographed from such a distance.

Infra-red Hygrometer

The infra-red hygrometer, the method of measuring humidity by absorption spectra analysis, has been developed to the point where it now offers attractive possibilities to the meteorologist in special problems where conventional methods prove inadequate and higher cost of instrumentation will be justified.

R. C. Wood describes in *Bull. Amer. Met. Soc.*, June 1959, a relatively uncomplicated instrument in which the energy attenuation in the 2·6 μ water band is related to the concentration of water vapour in the sensing path. The assembly consists of a source of infra-red radiation, a means for isolating selected wavelengths of radiation, the sensing path or absorbing column containing the atmospheric sample, and a radiation detector. Some areas of application for this technique are Micro-meteorology, Arctic meteorology and upper air meteorology which present special difficulties in the use of conventional methods.

Photographing the Sun by Ionized Helium Light

In March, the U.S. Naval Research Laboratory used a rocket to photograph the Sun's hydrogen atmosphere in ultra-violet light. The same group, led by Dr. Herbert Friedman, now plans to photograph the Sun's helium atmosphere—at even shorter ultra-violet wavelength. This component of the solar "weather" lies farther out from the Sun's visible disc, where the outer layer of the chromosphere merges with the inner layer of the corona. From the photographs at various wavelengths, there is emerging a picture of increasing gas turbulence and rising temperature at increasing heights above the surface.

The March photograph by hydrogen light (Lyman-alpha line) showed a strikingly stormy Sun. If this pattern persists there should be bright emission from ionized helium, even though helium needs a temperature of 20,000–30,000° C. to ionize, compared with 6,000–10,000° C. for hydrogen. There is a practical side to this work : rays emitted from the Sun's ionized helium may be responsible for creating the upper region of the Earth's ionosphere, and it may become possible to plot the solar weather and predict terrestrial effects such as short-wave radio "black-outs".

Non-magnetic Alloy for Instrumentation in Magnetic Fields

Measurements made in the presence of magnetic fields frequently require portions of the measuring apparatus to be fabricated from nonmagnetic materials ; such pieces, for example, as balance arms, sample holders, Dewar walls to be used between the poles, torsion fibres and galvanometer suspensions. These items are made of non-ferromagnetic materials such as copper, brass, silver, aluminium, lucite or quartz. Occasionally the small effects due to ferromagnetic impurities or even the intrinsic paramagnetic or diamagnetic moment of these materials become a problem.

A high-purity copper-nickel alloy of composition 96·3% copper and 3·7% nickel by weight, fabricated from copper rated 99·999% pure and nickel rated 99·997% pure, has been found to be completely non-magnetic. Experimental tests show the alloy to have zero magnetic moment at room temperature and less than a tenth of the magnetic moment of pure copper at all temperatures down to 2° K. The susceptibility of this alloy is found to be field independent from 0 to 24,000 œrsteds. A method of preparing the alloy is described by E. W. Pugh in the *Rev. Sc. Inst.*, 29 (12), 1118.

Research on Radiation Effects on Bacteria

A research project to study the effects of radiation on bacteria has been sanctioned by the International Atomic Energy Agency. The object of this research is to contribute

to an understanding of the reasons why micro-organisms vary widely in their sensitivity to ionizing radiation and to examine how their radio-sensitivity can be increased. Such an understanding would be of value in the study of some fundamental problems of radio-biology and radiation protection. In the matter of preservation of food by irradiation, it is known that many bacteria posses a high level of resistance to ionizing radiation requiring for their destruction dosages which may prove harmful for the food itself. The problem will be to find a method to increase the radio-sensitivity of bacteria by some artificial means before they are subjected to radiation, so that a low radiation dose may prove completely effective and safe.

Dr. Peter Alexander of the Chester Beatty Research Institute, London, will guide this project in collaboration with the Microbiology Department of the Imperial College of Science and Technology in Kensington.

Chlorophyll from Nettles

The Forest Research Institute, Dehra Dun, in the Himalayan foothills, has developed a process for extracting chlorophyll as a copper derivative from the stinging nettles which grow in abundance in the temperate Himalayan tracks. Dried leaves of the plant, powdered finely, are extracted with ethyl alcohol after infusion with a solution of copper sulphate. The extract is concentrated in an acidic solution and refluxed in the presence of a suitable copper salt. The copper chlorophyll separates out from the solution and is eluted with hot water and purified.

Moon Relay Station

Using the moon as a passive relay station radio communication link was successfully established between U.K. and U.S. across the Atlantic in a series of experiments carried out between May 11 and May 14, 1959. The transmitting station was Jodrell Bank (U.K.) and the receiving station was the Air Force Cambridge Research Centre, Mass (U.S.). A 1-kW, FM transmitter working on 201 Mc./s. was used with the 250 ft. steerable radio telescope of Jodrell Bank. At the receiving end in U.S., the 84 ft. radio telescope was used with receivers of various bandwidths from ± 2·5 to ± 10 kc./s. Similar receivers were also used on the telescope at Jodrell Bank for monitoring the local lunar returns.

Experiments lasting for about 40 hr. included transmission of audio tones up to 15 kc./s. and of messages by slow Morse, tests of intelligibility of speech and quality of music.

A number of major advantages may be expected from this lunar link system. Unlike conventional radio channels, this method will not be impaired by noise interference and blackouts caused by disturbances in the ionosphere. In addition, the new system opens up a whole new spectrum of frequencies in the already overcrowded radio channels for long range communication. The commercial interest in this field will no doubt stimulate further developments.

Marine Bacteria and Deuterium Concentration in Sea Water

In the course of studies of the calcium carbonate deposits of the Bahama Banks, conducted by the U.S. Geological Survey, there was a chance discovery of a marine bacterium which produced hydrogen gas. The bacterium which occurred in high concentration within the superficial sedimentary layer was isolated and cultured using the sea-water dextrose as substrate. Mass spectrometric analysis of the gas generated by this micro-organism revealed an unexpectedly high percentage of light hydrogen (protium) and an apparent absence of the normal isotope, deuterium, in the gas mixture. Subsequent analysis of the sea-water dextrose substrate showed the normal distribution of the protium-deuterium isotopes. It was apparent that the deuterium in the medium was being selectively fractionated by the cellular biochemical processes.

An understanding of these processes involved in separation and concentration of deuterium may have economic importance, as for instance in the production of heavy water. Of academic interest is the possible significance of the role of marine bacteria in the concentration of heavy water in the seas during past geologic time. Today, sea-water contains from 10 to 25% more D_2O than fresh water, the atmosphere, ice, and igneous rock.—*Science*, 1959, 129, 1288.

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