

which have isolated very long period motions, major strain adjustments following earthquakes and tidal strain. The use of tele-recording, the improvements in the different accessories including suspensions, drives, recording, chronometry, and measurement are discussed and the response characteristics of different seismographs including a description of the effect of barometric pressure fluctuations conclude this valuable contribution.

All the contributions are supplemented by extensive bibliographies.

It is difficult, in a short review, to do full justice to the extensive and valuable material presented in the contributions, whose express purpose has been to bring the descriptions up to date as regards the recent advances in the field of geophysics.

S. K. Roy.
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SCIENCE NOTES AND NEWS

Icerya pilosa Green on Sugarcane

Sri. O. S. Bindra and S. U. Kittur, Agricultural Research Institute, Madhya Pradesh, Gwalior, observe: *Icerya pilosa* Green (Coccidae: Homoptera), a comparatively new pest of sugarcane in India, was first recorded in India in 1937. It has since been recorded from Delhi, Karnal, Coimbatore and Meerut, and now from Gwalior, where it was noticed in July last. This mealy-bug is quite big in size and is densely covered over with white mealy powder. The damage is caused by the nymphs and adults sucking the sap. The plants thus weakened, turned yellowish and the young plants may be killed.

Trials at control of the mealy-bug show that sprays of "Basudin" and "Folidol E-605" containing 0.069% and 0.092%, respectively of the active ingredient are quite effective.

Biological Role of Potassium-40

Quite a number of radioactive elements are normally present in the tissues and organs of all organisms, both plants and animals, producing in general a weak α -, β -, or γ -radiation. Among these, potassium-40 deserves first mention, to be followed by carbon-14, hydrogen-3, rubidium-87, samarium-147, uranium-238, uranium-235, thorium-232, and so on. According to the number of atoms decaying, potassium-40 occupies the first place in organisms. It may be pointed out that man, during the whole of his life, obtains from cosmic radiation less than 1 r., whereas from potassium-40 radiation he obtains about 10 r.

Potassium, being isolated from different sources—natural salts, rocks, tissues of organisms, etc.—has practically always a similar isotopic composition. Therefore, organisms absorb-

ing potassium do not change their isotopic composition. In Nature, no noticeable fractionation of potassium isotopes occurs. The biological role of potassium is not clear. It is thought that potassium participates in carbohydrate and albumin metabolism of plants.

The biological function of potassium is often connected with the radioactivity of potassium-40. A direct experiment on *Aspergillus niger* by A. P. Vinogradov (*Nature*, 1957, 179, 308), however, shows that the radioactivity of potassium-40 plays no part in the growth of *Aspergillus niger*; only the chemical properties of potassium and its concentration were of importance.

Standards of Light

The Light Division of the National Physical Laboratory, U.K., has recently completed a new comparison of its secondary standard lamps with the internationally agreed primary standard light source. The British secondary standards are special tungsten filament vacuum lamps held by the Light Division. The international standard is a small ceramic tube, or cavity-radiator, immersed in a crucible-full of pure platinum. The metal is first melted and then slowly cooled. During the short period while solidification is taking place, the temperature remains stationary at the freezing point of platinum. At this temperature, at which the observations are made, the inside of the small radiator has, by definition, a luminance of 60 candles per square centimetre. More than a hundred 'melts and freezes', obtained with the aid of a high-frequency induction furnace, were used for amassing sufficient observations, which were made by precise photo-electric methods. Because of the Second World War, no such comparison had been made since the occasion,

some twenty years ago, when the National Physical Laboratory lamps were first calibrated in this way. Nevertheless, the values now found for their intensity agree, to within one half of 1%, with the previous ones.

Powder Diffraction Studies

When authors submit for publication papers that describe investigations in which X-ray powder measurements were made, but which omit the actual X-ray data, it is requested that these data be sent to the Editor of the Joint Committee on Chemical Analysis by Powder Diffraction Methods, for possible inclusion in the X-ray Powder Data File that is published by the American Society for Testing Materials.

The data should contain accurate listings of d values and intensities of reflections. Other items of information of value for the data file are: hk indices and lattice parameters, if known, radiation used, type of X-ray recording employed, method of estimating intensities (visual, photometric, Geiger-counter), plus any relevant information concerning the nature and preparation of specimens studied. For additional details, communicate with the Editor of the Data File, G. W. Brindley, College of Mineral Industries, Pennsylvania State University, University Park, Pa., U.S.A.

Mutation in Virus

Mutation in the chemical structures of viruses has been accomplished for the first time at the University of California. The rate of mutation induced is the highest ever achieved by any means and the mutants produce mutant offspring. Mutations have been induced by altering the fundamental structure of ribonucleic acid of a virus. Sulphanilamide introduced into the virus culture blocks the formation of thymine, normally an essential part of the nucleic acid of the viruses. The new virus formed accepted 5-bromouracil, added earlier, in the absence of thymine. About 10% of the offspring were mutants containing this chemical. This is a rate of mutation about 1,000 times larger than that occurring normally. These findings suggest the possibility of producing non-infectious viruses from infectious ones with the help of chemicals.

Drug Resistance in Bacteria

With the tremendous progress made in discovering ever more and better chemotherapeutic agents it looked as if bacterial diseases were under complete control. Unfortunately this has

proved not to be the case because almost all bacteria very rapidly develop resistance. In many London hospitals 50 to 80% of all staphylococcal infections are found to be resistant to penicillin.

The fascinating problem of bacterial resistance has been discussed recently at a meeting of scientists from all over the world at the Ciba Foundation in London. Apart from the immediate practical aspects—and these are very serious—this subject touches on all the most interesting genetic and adaptive processes of cells. In many cases a practical solution has been found, based on sound theoretical work, by using a number of drugs in combination right from the start of treatment, since the bacterial defences cannot easily adapt themselves to many different toxic agents. If the different drugs are given successively, then the invading organism may change step by step.

The great success which has been achieved against TB, and which has brought about the emptying of sanatoria, is due to the fortunate circumstance that several highly active chemotherapeutic agents were discovered within a short period of time. It is their use in combination which is so effective. A similar approach to the use of antibiotics is now being widely applied.

Conserving Water in Australia

Tests just completed by the Commonwealth Scientific and Industrial Research Organization at St. Stephen's Creek Reservoir in Australia, show that by feeding on to the surface of the reservoir in a solvent a solution of cetyl alcohol, a chemical extracted from sperm whale oil, loss of water by evaporation can be substantially limited.

During the past 14 weeks, under the supervision of the inventor of the process, Mr. W. M. Mansfield, evaporation from the reservoir has been reduced by 37% and more than 200 million gallons of water saved—the equivalent of six weeks' summer consumption in Broken Hill. The estimated cost of saving water is 1 d. for 1,000 gallons: under less favourable conditions the cost might be greater, but it should not exceed 6 d. a 1,000 gallons, which is a trifling cost compared with that of obtaining and conserving the water. It is added that a satisfactory film of cetyl alcohol has been maintained over the reservoir for over three months, in spite of exceptionally high wind velocities, and about 1 ft. of evaporation has been saved over an average area of 930 acres.

Europe's Biggest Telescope

Work on the erection of what is to be Europe's biggest telescope started recently at the Saint Michel de Provence Observatory in Southern France, and should be completed next August. The telescope, built in Britain, is remarkable not only for its size but also because it incorporates two important innovations.

One is an air-conditioning device in the telescope tube which will reduce distortion and blurring caused by the mixing of the cool night air with warm air in and around the telescope dome. The other is an "electronic image receiver" invented by two scientists of the Paris Observatory: Professor André Lallemand and M. Maurice Duchesne. This device replaces the photographic plate generally used to record the optical image of the stars with electronic apparatus somewhat akin to a television camera and considerably more sensitive to light. This increased sensitivity will make it possible to reduce exposure time and obtain much sharper pictures of planets such as Mars and Jupiter, which are very difficult to photograph.

Saline Water Conversion

An International Symposium on Saline Water Conversion has been planned for the first part of November 1957, in Washington, D.C., under the sponsorship of the Office of Saline Water of the U.S. Department of the Interior, and the National Academy of Sciences, National Research Council.

The programme for the meetings covers such topics as power distillation, electrodialysis, osmosis, solar distillation, freezing, and other scientific approaches to the problem of conversion of saline water for agriculture, municipal, and industrial uses. Scientific papers presented during the three-day conference will be published by the Academy Research Council in its numbered series of scientific and technical monographs.

Further details about the Symposium can be had from the Division of Physical Sciences,

National Academy of Sciences, 2101, Constitution Avenue, N.W., Washington 25, D.C.

Fermi Professorship

Plans to endow an Enrico Fermi distinguished service Professorship at the University of Chicago in memory of the renowned nuclear physicist have been announced by M. J. Kelly, President of Bell Telephone Laboratories, who is Chairman of a National Committee to establish the Professorship.

The new Chair, which will be in the University's Institute of Nuclear Studies, is designed to perpetuate and memorialize Fermi's scientific contributions. He was both teaching and conducting research at the Institute at the time of his death in 1954.

Further particulars regarding the Professorship can be had from W. V. Morganstern of the University of Chicago, or W. Fuller, Bell Telephone Laboratories, 463, West Street, New York, N.Y.

Aeronautical Society of India

At the Ninth Annual General Meeting of the Aeronautical Society of India held recently, the following office-bearers were elected for the year 1957: *President*: Air Marshall S. Mukerjee; *Vice-Presidents*: Dr. V. M. Ghatage, Shri K. K. Roy, Shri K. M. Raha and Dr. P. Nilakantan; *Honorary Secretary*: Shri S. C. Sen.

Award of Research Degree

The University of Poona has awarded the Ph.D. Degree in Biochemistry to Mrs. Violet Bajaj for her thesis entitled "Phosphate Metabolism of Moulds".

ERRATA

Page 122, line 3, left column, read:

$10_{II} + 10_I \text{ Ca for } 10_{III} + 10 \text{ Ca}$

Page 122, Table I, line 4 and under "Meiotic Behaviour" in Column 5, read:

$10_{II} + 10_I \text{ for } 20_{II} + 10_I$

NOTICE

THE Editorial Office which was temporarily located at Madras-25 has now been transferred to Bangalore permanently.

All material intended for publication in *Current Science*, corrected proofs, books for review and exchange journals may, therefore, be sent to the following address hereafter:

The Editor, *Current Science*,
Malleswaram P.O., Bangalore-3.

~~Remittances~~ **Remittances**, correspondence regarding subscriptions to the Journal, advertisements, etc., may please be addressed as usual to:

The Manager, Current Science Association,
Malleswaram P.O., Bangalore-3.