miles of Scottish soils, and continued the study of conditions and practices on upland grazings with special regard to heather management. Improvements of existing analytical methods are reported by the Department of Spectrophotometry, and the use of a double-beam infra-red spectrometer has assisted the positive identification of some substances present in soil organic matter. Investigations on the carbohydrate and nitrogenous constituents of the soil have been continued by the Department of Soil Organic Matter. Other activities of this Department include studies in the transformation of fatty materials in the soil by Actinomycetes, the physiology of aerobic thermophils, lignin decomposition studies and work on peat classification, including pollen analysis. The Department of Plant Physiology, working with sugar-beet disks, finds that phosphate absorption is related to the reducing-sugar content of the cell. It is also suggested that the ratio of phosphorus to iron in leaves gives a clearer picture of the iron status of plants than the individual concentration of these elements, high ratios being characteristic of iron-chlorotic plants. Investigations of soil fertility directed towards improving fertility practice, clarifying the significance of soil properties in relation to crop production and developing methods for evaluating the nutrient status of soils, have been continued.

Journal of the Institution of Telecommunication Engineers, India

The first number of the *Journal of the Institution of Telecommunication Engineers, India* (see *Nature*, July 16, p. 100), was published in March, and for the present it will be produced as a quarterly (from the Institution, Curzon Road, New Delhi; Rs. 15 a year or Rs. 5 per copy). It is intended that each issue of this *Journal* will normally comprise an editorial note, two or three research papers, articles of general interest for students, reviews of papers, news and notes, and letters to the editor. The first number contains the texts of the addresses delivered at the inaugural session of the Institution on November 2, 1953: first, the address of welcome by A. C. Ramchandani, chief engineer of All-India Radio; next, the inaugural address by Dr. S. Radhakrishnan, vice-president of the Republic of India; and then the presidential address by B. R. Batra, chief engineer of the Posts and Telegraphs Department. Mr. Batra's second presidential address, delivered on December 12, 1954, is also reproduced. The more technical material published in this issue comprises an article on line fault location by pulse technique, by T. K. Mahadevan; an account of radio measurements at Jabalpur during the solar eclipse of June 30, 1954, by members of the Government Engineering College at Jabalpur; and a paper by S. Sampath on power density diagrams of short-wave aerial arrays. The *Journal* concludes with the annual report of the Council of the Institution for 1953–54, and a list of current members.

Anguinomorph Lizards

In 1878 Steindachner described a lizard from Sarawak which he named *Lothanotus borneensis*. Only a few specimens have been collected since then, so that it is still rare in museums. As it was regarded as closely related to *Heloderma*—indeed, it was sometimes put in the same family—it presented a remarkable example of discontinuous distribution. S. B. McDowell, jun., and C. M. Bogert in "The Systematic Position of *Lothanotus* and the Affinities of the Anguinomorph Lizards" (*Bull. Amer. Mus. Nat. Hist.*, **105**, Art. 1, 1954; pp. 142+43 figs.+6 plates; 6 dollars) started to examine this problem but were soon led into wider fields and examined the crania of 306 living reptiles and those of eight related fossil genera. This work is illustrated, *inter alia*, with the detailed drawings of the skulls of twenty-eight species of reptiles, and as the majority of these are original they furnish a very valuable series for reference. These and the other text-figures are excellently drawn and well reproduced. In addition to the claim that *Lothanotus* is allied to *Heloderma*, Nopcsa suggested that it also resembled *Shinisaurus crocodilurus*, another rare lizard from southern China, and this point is also specially investigated. The procedure adopted is to give full accounts of the external features, skulls and post-cranial skeletons of these species and of the classical lizard genus *Varanus*, and then to make detailed comparisons between them and a series of key forms. Among the conclusions reached is that the Anguinomorpha, as here defined, include the extinct Mosasauridae and constitute a natural infra-order divisible into two superfamilies, the Diploglossa and the Platynota. *Shinisaurus* belongs to the former and, although *Heloderma* falls in the latter, it is in a separate family not closely related to the Lothanotidae. Some of the characters of *Lothanotus* are such as might be expected in a form ancestral to snakes. It is further suggested that the Typhlopodidae should not be included in the Ophidia but should be regarded as a highly specialized line of Anguinomorph lizards the resemblances of which to the snakes result from convergence. Altogether, this is a most useful contribution upon which the authors are to be congratulated.

Biological Races of *Phytophthora infestans* in Canada

In recent investigations of the *Phytophthora* blights of tomatoes and potatoes in eastern Canada, it was found that different isolates of the fungal pathogen did not always yield reproducible effects in inoculation experiments. This led to the view that different biological races of the fungus might be involved—a view fully borne out by further experimental work now reported by K. M. Graham and H. N. Racicot (Soc. de Quebec pour la Protection des Plantes, Thirty-fifth Rept., p. 50; 1953). Thirty-one isolates of *P. infestans* from potatoes were examined. Cytological study showed that the zoospores are uninucleate and that genetically pure lines could therefore be obtained, these being cultured on oatmeal agar. On a host-range comprising both potato and tomato varieties, it was found in comparable inoculation tests that three races of the pathogen could be differentiated, their respective effects being indicated.

Photosynthesis in Different Phyla

L. Norris, R. E. Norris and M. Calvin have reported on a survey of the rates and products of short-term photosynthesis in plants representative of nine different phyla (*J. Exp. Bot.*, 6, 16, 64; 1955). When short-term experiments on photosynthesis, using carbon-14 dioxide and paper chromatography, were performed with twenty-seven different plants representing nine phyla, there was a remarkable uniformity in the types of ethanol-soluble compounds which became radioactive in the entire group of plants used. The percentage amounts of the different compounds varied considerably among the various

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hopeful sign of the times that so many men in farming are prepared to undertake the onerous tasks of management which intensive production involves.

THE FRAGMENTATION OF SCIENCE

IN his presidential address to Section X (Assembly of Corresponding Societies), Mr. Ritchie Calder points out that, by the excess of specialization forced upon them by the rapid advance of research and the vast literature of their subjects, scientists are using only a part of their faculties and allowing the others to languish. They are becoming intellectual cripples. They are so busy synthesizing Nature that they have no time to synthesize their own science.

Present-day science, by its emphasis on experimental research, has forsaken natural philosophy, and in its hurried retreat from scholasticism is forgetting the scholarliness in which it made common-ground with the humanities. Over-specialization gives the scientist the excuse for saying "We have no time for other subjects", and their colleagues in the arts the excuse for saying "How can we understand ?". The fragmentation into more and more branches, each with its jargon, is dividing scientists from each other and from the wider public. This separation from the wider community is fraught with danger for our civilization and for science itself. Science, which exists to remove mystery and magic, is creating its own mysteries and magic. People regard science with a kind of superstitious awe, but count on it for the gadgets. In the absence of proper understanding of the methods and processes of science and of any social integration, the apparent haphazardness of discovery encourages a popular attitude towards science which is distrustful and unhealthy.

The educational system of Britain has become lopsided. Our schools and universities, by too early and continuing segregation, give too little science to one section of citizens and too much to another. This is as much a criticism of the humanities as it is of the science faculties.

The public has an uneasy awareness that the branches of science are out of step. On such an issue of life or death as the hydrogen bomb, it is realized that the physicists have outstripped the biologists—with the sombre risks which Lord Adrian forebode. Prof. A. V. Hill had also stressed the risks of medical science outstripping the means to feed the lives that are saved.

It is suggested that the proposal put forward in the British Association report on Post-War University Education (*Advancement of Science*, 3, No. 9) be re-examined—that there should be honours and pass schools of "Philosophy, Natural and Social" and that this should be reflected in the schools as general instruction on "scientific methods and social implications of science" ; that experts—doctors, engineers, agronomists, etc.—going into the widening fields of mutual aid should temper their expertize by some training in social anthropology, and that we would do well to revive, even at this late date, Comenius' idea of *Pansophicon* (1641), to bring scientists together to assess and explore all natural knowledge and propound it and make it widely known for the adoption by men for their benefit. Then, perhaps, we could get that synthesis of scientific knowledge by which science and humanity could progress together and science become wisdom.

NEWS and VIEWS

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plants, as would be expected because of their inherent metabolic differences and the variations in their physiological states induced by experimental conditions. Sucrose became radioactive in very different amounts in two major groups of plants, namely, those containing only photosynthetic tissue, and those containing non-photosynthetic tissue as well. The amount of radioactive sucrose in the former group was much lower than that in the latter. An unidentified compound became radioactive in appreciable amounts in two of the blue-green algæ, but was radioactive in very small amounts, or not visible at all, on the chromatograms of all other plants.

Changes in Lunar Topography

IN a second paper on changes observed on the surface of the moon, Dr. H. P. Wilkins deals with "Bubbles and Streaks" (*J. Brit. Interplanetary Soc.*, **14**, 3 ; May–June 1955). In collaboration with Patrick Moore, Wilkinson has recently investigated a number of rounded hills or 'domes' and has listed about a hundred, most of which have diameters of two to three miles and heights of a few hundred feet. A very remarkable thing about these domes is that they generally have a deep pit at the top, the pits being seated centrally, never at the side ; it is extremely improbable that they could have been caused by meteorites, which would strike the sides also, but there are no signs of this. As very few of these domes were found until recently, the conclusion is that the older observers were not as careful in their work as is generally supposed, or, alternatively, they have been recently formed. If the latter hypothesis is adopted, the most likely explanation is that some volcanic activity still remains on the moon, the slow welling out of the magma forming the dome, and the pit at the top representing the vent. One very remarkable piece of evidence tending to confirm this view is the fact that domes now stand on some of the sites where older observers announced depressions. It is suggested that local swellings of the surface may occur in places and that the resulting domes are cavernous. Dealing next with the streaks, Wilkins points out that these were almost entirely overlooked by the older observers ; and while admitting that they may be due to faulting or the formation of narrow cracks, he suggests that they may be due to some low form of life, such as lichens or fungus. This suggestion was actually made many years ago by W. H. Pickering, who thought patches in the crater Eratosthenes seemed to move about and to choose