



Fig. 3. X-ray shadowgraph of book louse (*Liposcelis granicola*) and silver grid of 1,500 mesh/in. Original magnification,  $\times 25$ ; final magnification,  $\times 37$

needed and the advantage of the specimen being in air would be lost.

The apparatus described, a fuller account of which will appear elsewhere, can also be used as a fine-focus tube for X-ray analysis. Indeed, the use of a magnetic lens is similar to that in the diffraction tubes devised by Goldsztaub<sup>5</sup> and by Witty and Wood<sup>6</sup>. It gives a much smaller spot than the fine-focus diffraction tube of Ehrenberg and Spear<sup>7</sup>, which makes the maximum use of the electrostatic focusing action of the electron gun but employs no subsequent lens.

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<sup>1</sup> Sievert, R., *Acta Radiol.*, **17**, 299 (1936).

<sup>2</sup> von Ardenne, M., *Naturwiss.*, **27**, 485 (1939).

<sup>3</sup> Cosslett, V. E., "The Electron Microscope", pp. 72, 116 (Sigma Press, London, 1947).

<sup>4</sup> See Crowther, J. A., "Handbook of Industrial Radiology", pp. 151-182 (Institute of Physics, London, 1946); and Engström, A., "Progress in Biophysics", pp. 164-196 (Butterworth, London, 1950).

<sup>5</sup> Goldsztaub, S., *C.R. Acad. Sci., Paris*, **224**, 458 (1947).

<sup>6</sup> Witty, R., and Wood, P., *Brit. J. App. Phys.*, **1**, 305 (1950).

<sup>7</sup> Ehrenberg, W., and Spear, W. E., *Proc. Phys. Soc., B*, **64**, 67 (1951).

## EMPIRE COTTON GROWING CORPORATION, 1921-50

A SHORT history of the Empire Cotton Growing Corporation, 1921-50, originally published in the *Empire Cotton Growing Review* of January 1951, is now available as a pamphlet. It includes a number of matters of scientific interest. The Corporation was incorporated by Royal Charter on November 1, 1921, as a result of the report of the Board of Trade's Empire Cotton Growing Committee in 1920, and was financed partly by a capital grant from the Imperial Government and partly by a levy on all raw cotton spun into yarn in the United Kingdom. Since the repeal of the Cotton Industry Act on March 31, 1948, the Corporation has received an annual grant of £18,000 from the Cotton Board.

Resembling in many ways a research association, the Corporation has concentrated mainly upon production, with its relevant agricultural and scientific problems and requirements. A first step was the training and enlistment of a scientific staff, and in this, since 1922, the Corporation has been in close association with the Imperial College of Tropical Agriculture in Trinidad. Relations established with the Shirley Institute at Manchester, by enabling plant-breeders to test new cottons at a much earlier stage, have led to a great saving of time, land and labour. Another early step was to enlist the help of scientific experts in general agriculture, soil science, genetics and plant breeding, plant physiology, entomology and plant pathology, and particular tribute is paid to the services of the late Sir John Farmer.

The agricultural and scientific policy of the Corporation has fully recognized that cotton-growing, to be permanent, must be associated with other crops in the general system of agriculture of the countries concerned. A Research Station was established in Trinidad in 1926 and closed at the end of 1944, when it was decided that the next phase of the work could more advantageously be carried out in a country producing a commercial cotton crop. A site for the new Station was found at Namulonge, Uganda, and of the estimated capital cost of £206,500 half was provided from Colonial Development and Welfare Funds, £78,250 from the Corporation's invested resources, and £25,000 from the Cotton Industry War Memorial Trust. The Corporation is to find £170,000 of the recurrent expenditure, estimated at £400,000 over the ten years from October 1, 1947. Colonial Development and Welfare Funds are providing £100,000 and the Governments of Uganda, Tanganyika, Nigeria, Kenya and Nyasaland, jointly, have promised £130,000. The Uganda climate has necessitated stationing the Cytogenetics Section at Shambat, near Khartoum. Figures are quoted to demonstrate, on the basis of record crops, the capacity of the Empire to grow more than a million bales of cotton per annum; and three-year averages show that production in the Anglo-Egyptian Sudan has increased from 23,225 bales in 1918-21 to 299,872 in 1946-49; in Uganda from 55,196 to 262,929; in Kenya from 233 to 6,574 bales; and in Tanganyika from 2,442 to 48,345 bales, for the same periods.

## SOUTH-EASTERN UNION OF SCIENTIFIC SOCIETIES ANNUAL CONGRESS

AT the invitation of the Camberley and District Natural History Society, the South-Eastern Union of Scientific Societies held its fifty-sixth annual congress at Camberley during April 26-29 under the presidency of David Seth-Smith. The local committee for the congress was under the chairmanship of Major Maxwell Knight, with Miss Jean Armitage as local secretary.

At the 'young naturalists' evening', Dr. W. E. Swinton, of the British Museum (Natural History), lectured on "Prehistoric Reptiles", illustrating his remarks with lantern slides and films. A Nature quiz competition took place between teams from the junior section of the Natural History Society and the

local schools. The junior section also largely contributed to the success of an excellent nature-study exhibition by displaying specimens, examples of their field-work, notebooks and drawings.

The presidential address to the Zoological Section was given by Sir Philip Manson-Bahr, who spoke on "The Contribution of Zoology to Medicine". He dealt with the early investigations into the causes of elephantiasis and malaria and with subsequent work upon the life-cycles of the insects responsible for these and other diseases. A. J. Low gave the presidential address to the Geological Section and conducted an excursion to the Jealott's Hill Research Station of Imperial Chemical Industries, Ltd., where he demonstrated some of the points of his address dealing with soil fertility, the influence of leys, microlysimeters and soil profiles.

Mr. Seth-Smith's presidential address to the Union was on "Man's Control of Wild Animals". He commenced by saying that there are people who think that zoological gardens should not be allowed to exist, as it is cruel to confine any wild animal. Such people invariably say they do not visit the zoo because they do not approve of it. Mr. Seth-Smith said that he has always been fond of animals and so of zoos, for there one can see animals which one could never hope to see in a wild state, can study their forms and actions, and know them individually and intimately. All domesticated animals were derived from wild species, and the world is now dependent upon them for its very existence. The camel was domesticated so long ago that it is not known where its wild home was. Job possessed six thousand of them, so that they were domesticated before his time. In England the first real zoological gardens was established by Henry I at Woodstock in Oxfordshire; it was removed to the Tower of London by Henry III and was transferred to Regent's Park, London, on the formation of the Zoological Society in 1829. Zoos are of the greatest educational value, for though the student can read about animals and see their stuffed skins in museums, it is not until he observes them in the wild or in captivity that he acquires a true idea of their living form.

Dealing with the problem of how do animals feel about being in a zoo, Mr. Seth-Smith said his thirty years of experience as curator led him to think that the majority, if capable of choosing, would vote for a safe and comfortable home in captivity. Most animals in a zoo are born there or are brought in from the wilds when quite small babies. Most wild animals have their own areas in which they live, and in captivity they regard their enclosures as their territories and apparently are not particular as to their size. Scientific experts are employed to ensure the health and happiness of the animals. As an example, almost every wild animal suffers from internal parasites. The very first thing at a zoo with a new arrival is thorough examination for, and treatment of, these pests. Very few wild animals die of old age or sickness. The majority are preyed upon, while the predators when old or infirm either die of starvation or are themselves killed. In zoos they live their full lives, the span of which is longer than their chances in a native haunt. Man is the greatest enemy of all wild life; his greed, cruelty and ignorance are leading to its extermination even to-day. Wild animals are afraid of man when taken under his control; but when well treated, well fed and safe from enemies, they soon become reconciled and regard man as their protector. Some animals have been saved from total

extinction by being taken into zoos and collections. Were it not for zoological gardens we should have a poor idea of the wonderful animals that share the earth with us and should have to rely chiefly upon the stories of hunters, whose chief idea was perhaps to magnify the danger in their destruction.

Other events that took place at the meeting are, briefly, as follows. Prof. F. W. Jane, as president of the Botanical Section, spoke on "Trees and Scenery", and H. H. Coghlan chose for his presidential address to the Archaeological Section the theme "Aspects of Prehistoric Metallurgy in Southern England". Excursions were conducted to Frensham Pond and Haslemere Museum with Major Maxwell Knight and Francis Rose as leaders. C. D. Ovey described aspects of weather and weather forecasting, showing 'Kodachrome' slides of features of meteorological interest. He stressed the importance of relating scientific observations with those of the field naturalist and the farmer. At the general assembly the methods of developing the usefulness of the Union to its affiliated societies was discussed at length and a sub-committee appointed to formulate schemes for that purpose.

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## SOUTH-WESTERN NATURALISTS' UNION ANNUAL CONFERENCE

THE South-Western Naturalists' Union held its 1951 annual Whitsuntide conference (the twenty-fourth) during May 11-14 at Taunton as guests of the Somerset Archaeological and Natural History Society. It was to this Society, and particularly to the hard work of the local secretary, A. D. Hallam, in planning the programme, that the success of the conference was largely due.

A reception was held by the Mayor, Councillor W. F. Heywood, at the Municipal Buildings on the evening of May 11, and then on the following day nearly sixty members visited the Blackdown Hills under the leadership of Mr. and Mrs. Hallam. Halts were made at Priors Park Wood, Britty Common, Castle Neroche and Ashill Church. At Priors Park Wood, where many birds, including the nightingale, were heard and where several badger setts were seen, the attention of the botanists was directed to the marked influence that changes in the geological formation had upon the vegetation. On Britty Common exposures of the Upper Greensand and overlying gravels were examined by the party. H. St. George Gray conducted the party over the earthworks of Norman date known as Castle Neroche, and the interesting features of Ashill Church were explained by Mr. Hallam. In the evening, W. A. Seaby lectured on Ham Hill, where many important finds of late Iron Age and Roman date have been made; the talk was amply illustrated by lantern slides.

Most of May 13 was taken up by an excursion to the region around Minehead. In the morning, Porlock Marsh was explored, under the guidance of H. G. Hadden, for plants and animal life; and members visited the village of Bossington, after which they drove to Horner Woods and from there to Minehead. After tea the party divided; one half visited Cleve