

lating closely to fumigation of grain, were problems like the penetration of the gas into the food-stuff, its physical adsorption or chemical reaction and the nature and permanence of residual effects, in addition to the toxicity of the gas to the many insect species concerned. Sprays for the disinfection of warehouses in which insect-free food-stuffs had to be stored, were developed. In order to ensure a reasonably long toxic life of the insecticide film deposited on walls, boxes, etc., a method was developed for pretreating the surfaces to be sprayed, which gave a greatly increased duration of toxicity.

The Pest Infestation Laboratory also undertook work on fly-sprays on behalf of the fighting services and was among the first to report on the striking toxicity of DDT to house-flies. A new spray-gun was also developed designed to withstand the toughest treatment and at the same time to provide an accuracy of performance not hitherto achieved.

In this context, the present conditions obtaining in India are of special interest. A somewhat parallel organisation to the Ministry of Food's Infestation Control Division in England, was set up in India practically after the cessation of the Second Great War, under the title—"Directorate Storage", whose duty was laid down to be the dissemination of knowledge in respect of useful methods of large-scale storage of locally-procured and imported grains of different kinds and the training of personnel for organising proper storage and promoting "go-down hygiene" and issuing of useful propaganda leaflets prescribing certain definite regulation to be followed. But no research laboratory of the kind of the Pest Infestation Laboratory in England, was set up, to undertake research to enable the control personnel to operate efficiently. Problems like the fumigation of

silo bins in England, are numerous in India and have long been waiting to be tackled with special reference to the peculiar and varying Indian conditions of storage of grains. Estimation of infestation of grain under Indian methods of storage and in a variety of receptacles used for storage, is vastly different from that applying to the silo bins. Equally different are the problems like the penetration of the gas, its sorption and the nature and permanence of residues, etc., in India. A host of other allied matters have been in need of investigation. A special well equipped central laboratory with competent staff alone could undertake research on these important and urgent problems.

The Indian Agricultural Research Institute at Delhi and the Agricultural laboratories in the several Provinces and States have never been properly and adequately staffed and financed for the purpose of conducting research on the varied problems; and the results already obtained by workers in these laboratories and by workers of special schemes financed by the Indian Council of Agricultural Research have not covered a wide enough field. One of the chief reasons for this state of affairs is the inherent defect in the organisation and working and lack of co-ordination. These could perhaps be remedied by organising a central Pest Infestation Research Laboratory, generously equipped and adequately staffed, and Bangalore would appear to offer an ideal place for locating the laboratory not only because of the substantial amount of pioneering work which has been carried out by the Entomological section of the Department of Agriculture but also on account of an active school of research on Insect Nutrition and Insect Physiology which has developed in the Division of Fermentation Technology at the Indian Institute of Science.

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### BEE COMPASS

Sunlight and the polarized light of the sky appear to enable a scout bee which has discovered a source of nectar to orient herself when executing a bee dance to tell other bees about her find. Distance is indicated by the dance pattern, direction by the way the bee's body is pointed most of the time, according to the Austrian entomologist, Professor Karl von Frisch. *Science Service* reports his announcement of this discovery at a recent meeting of scientists in Washington D. C.

In total darkness or red light (which bees

cannot perceive) the finder-bee became confused in her dance, but oriented herself toward the nectar find when a flashlight was held in the approximate position of the sun. When the flash-light "sun" was held in a false position, the bee gave an incorrect direction. The bee was also properly oriented when she could see a small patch of blue sky (polarized light) but became confused in the unpolarized light of a white cloud drifting across the opening. (By courtesy to *Sky and Telescope*, 1949, VIII, P. 253.)