Bahru, in collaboration with the State Agricultural Officer, Johore.

In addition to the introductions sent to Australia and Malaya, requests for legume and grass seed samples from Australia came from Malaya, India and Ceylon. Arrangements were made with the Plant Introduction Section, Canberra, to forward the species and varieties sought.

In conclusion, it can be stated that the objectives as set out here were successfully fulfilled. Several recommendations were put forward in the report with respect to general agricultural development within the region, particularly the tropical belt.

It is my hope that, as a result of this preliminary survey, further research projects will be designed to follow up work on the tropical Leguminosae within the Asian–Australian region.

Epilogue

The plant descriptions were completed, so far as possible, in Canberra, during April–May 1962, where excellent facilities are available in the Botany Department, C.S.I.R.O. Division of Plant Industry, and within the herbarium of the C.S.I.R.O. Division of Land Research and Regional Survey.

Project A. The legume collection. The collections of Leguminosae, and miscellaneous species, are held by the Plant Introduction Section, C.S.I.R.O. Division of Plant Industry, Canberra. A large number of the samples were transferred to the C.S.I.R.O. Division of Tropical Pastures, Brisbane, during 1962 under the charge of Mr. Ron Williams, who is plant introduction officer in that Division. The samples have been given numbers (C.P.I. numbers) which differ from the collection numbers listed in the report, and descriptions have been issued by the Plant Introduction Section[5–7].

Sub-project 1. *The* Rhizobium *collection.* The collection of legume root nodules and cultured *Rhizobium* specimens was sent to Dr. Norris, as mentioned earlier. Writing in the Division's annual report for 1961–62, Dr. Norris reveals that one of the soybean root nodule samples (number seven, from north Thailand) has yielded an isolate which has already replaced the commercial strain of *Rhizobium* for soybeans in Queensland. A disturbing aspect of Dr. Norris's evaluation of the cultured strains was the fact that several of them were not pure, carrying contaminants which could seriously interfere with their effectiveness as inoculating agents in the countries where they are being distributed.

Sub-project 2. *The pineapple planting material collection.* The pineapple planting material is being held under quarantine at the quarantine station of the Department of Agriculture on an island just off the coast of Singapore, for a period of one year. It is being transferred gradually to the Pineapple Experiment Station at Alor Bukit, Pekan Nanas, Johore State, under the control of Dr. S. Dutta, who is in charge of the breeding programme. Some of the pieces rotted in transit to Malaya, but by early 1962 there were some 339 established at the quarantine station representing nearly all the groups collected throughout Asia and Australia. The material will provide valuable stock for future pineapple plant breeding in Malaya.

Although I was employed by the Malayan Pineapple Industry Board at the time of the research project, I have since transferred to the C.S.I.R.O. Division of Land Research and Regional Survey, Canberra. I am at present stationed at the Kimberley Research Station, Kununurra, Western Australia, a tropical station in northern Australia suitable for testing the Asian Leguminosae and *Rhizobium* introductions.

[1] "Plant Introduction and Exploration in Australia and the Indian Ocean Region," Hartley, W., *Proc. Pan Indian Ocean Sci. Cong.*, Perth, Aug., 1954.

[2] *Quarterly List of Introductions*, No. 67 (Plant Introduction Section, C.S.I.R.O., Canberra, 1961).

[3] A discussion of the technique can be found on pp. 61-2 of *FAO Agric. Study* No. 41, *"Plant Exploration, Collection and Introduction,"* by K. O. Whyte (1958).

[4] Norris, D. (unpublished work).

[5] *Quarterly List of Introductions*, No. 65, for the quarter ended June 30th, 1961. Plant Introduction Section, Division of Plant Industry, C.S.I.R.O., Canberra, A.C.T., Australia. (Containing descriptions of part of the Philippine collection (C.P.I. numbers 29160—19282).)

[6] *Quarterly List of Introductions*, No. 66, for the quarter ended September 30th, 1961 (see ref. 5). (Containing descriptions of part of the Philippine collection (C.P.I. numbers 29425—29532), together with descriptions of the complete collections from Thailand (C.P.I. numbers 29548—29710), India (C.P.I. numbers 29736—29879, 30034—30072, 30081—30104, 30169—30248), Pakistan (C.P.I. numbers 29880—29938, 29939—29979), Malaya (C.P.I. numbers 29992—30033) and Ceylon (C.P.I. numbers 30106—30159).)

[7] *Quarterly List of Introductions*, No. 67, for the quarter ended December 31st, 1961, (see ref. 5). (Containing descriptions of the collection from Burma (C.P.I. numbers 30656—30792).)

SNAKE BITE

OF the 2,500 or so species of snakes in the world, only about one in ten is venomous. Despite this comparatively small number the problems they cause are alarming. In Britain snake bite poses no serious problems. It has been stated that only seven people have died within the past fifty years and of this number five were young children. The death of a twelve-year-old girl was reported in 1961.

In many countries, however, snake bite does give rise to serious problems. It has been estimated that 30,000–40,000 people die from this cause every year. In Asia some 30,000 people are bitten annually and, of this number, about 25,000 are fatal. This represents approximately five-sixths of the world's total. The snakes largely responsible for these deaths are: the Indian cobra (*Naja naja*), Russell's viper (*Vipera russelli*), the saw-scaled cobra (*Naja hannah*), the Indian krait (*Bungarus caeruleus*), and the Ceylon krait (*Bungarus ceylonicus*). Vipers cause most deaths, first, because of their large numbers, and, secondly, because they are active in daylight. Man comes less into contact with cobras and kraits, since they are nocturnal in habits. Bengal and Burma have the highest death rate from snake poisoning in the whole of India and Indo-China owing to the fact that they are rice-growing areas, and in such habitats Russell's viper abounds. In Ceylon, Russell's viper and Ceylon kraits kill almost 300 people annually. In the North-West of India the saw-scaled viper is abundant. This is the most vicious snake known and accounts for the greatest percentage of deaths in that region.

In Africa about 800 people die each year from snake bite. The mambas and pit vipers are largely responsible. In the United States of America fatalities number about 15 per annum. For Central and Southern America the figures are 300 times higher than that of the United States. The snakes which cause most deaths in these countries are: the fer-de-lance (*Bothrops atrox*), the bush master (*Lachesis muta*) and the Brazilian rattlesnake (*Crotalus durissus*).

The sea-snakes of India and Indo-China are extremely poisonous. These snakes do not attack swimmers but are often landed with a fisherman's catch. Fishermen walk barefoot among the catches and death from snake bite is not uncommon. The actual figures are not known. Figures for deaths in China and the U.S.S.R. are not available, since they are never made public.

The nature of venom, venom apparatus, reaction to venom and types of treatment are well described by John Reed, Sheerwater County Secondary School, Woking, in the Autumn 1963 issue of *Biology and Human Affairs* (29, No. 1; 1963).