



Eva Crane Trust

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Places to visit

Japan

I was fortunate enough to be invited to lecture in Japan in March, and am therefore able to pass on information that may be of practical help to readers, in view of the 30th International Apicultural Congress there next year. Some participants will certainly wish to see more than can be fitted into the Congress schedule, and all the places suggested for visiting are on the central and largest island, Honshu.

Nagoya, the venue for the Congress, is a large industrial city on the south coast of Honshu, at the mouth of the Nagara river; it is two hours by train west of Tokyo (Fig. 1). Nagoya, like many Japanese cities, was destroyed by bombing during the Second World War and therefore consists almost entirely of modern buildings. But only 30 km to the north-west, half an hour by train, is Gifu, which has considerable beekeeping interest.

Gifu

Gifu is another industrial city, higher up the Nagara river, but it lies in a wide plain surrounded by hills except to the south. Historically and currently, it is the centre of commercial beekeeping in Japan. In 1901 Hiroshi Watanabe, the 'father' of present Japanese beekeeping, brought box hives of *Apis cerana* by ship from Mie (on the peninsula south of Nagoya), up the river to Gifu. Then in 1920 commercial beekeeping was started—in Gifu—with *Apis mellifera* imported from Hawaii; *Apis mellifera* had already been used elsewhere in Japan for experimental purposes. The beekeeping was based especially on honey production from Chinese milk vetch (*Astragalus sinicus*) which grew wild in the flat countryside round Gifu. Beekeeping boomed in the 1960s, but since 1970 increased use of the land for urban development and changes in the agricultural pattern have considerably reduced the honey harvest.

A number of families active in the early pioneering times are still important in the beekeeping industry in and around Gifu. One beekeeping supply firm, which has an interesting display of beekeeping materials, would welcome visitors, by prior arrangement: Gifu Yoho Co. Ltd, 1-1 Kano-Sakurada, Gifu City. A honey-packing plant could be visited similarly: Nisshin Honey Co. Ltd, Maki, Anpachi-cho, Anpachi-gun, Gifu



On the scientific front

Honeybee faeces—an explanation of 'yellow rain'?

Since the late 1970s claims have been made about the use of toxic chemicals as warfare agents in south-east Asia, especially in Laos and Kampuchea. Many reports were given verbally by refugees who said that some people had died and that others had suffered from rashes, pulmonary and bronchial trouble, and fevers, after coloured materials had been sprayed from aircraft¹. Where yellow spots were noticed on leaves of trees and elsewhere, the material sprayed was referred to as 'yellow rain'. Sources in the USA suggested that toxic materials produced by the metabolism of fungi (mycotoxins) had been used, dispersed in pollen.

In an unpublished report² Meselson and Seeley say 'wild colonies of south-east Asian honeybees perform massive defaecation flights which can cover a swath thousands of square metres in area with 100 or more spots of yellowish faeces per m²'. They describe how, in Thailand in early 1984, they were caught in a shower of 'yellow rain' which lasted about 5 minutes, and deposited approximately 200 spots of yellowish faeces per m². The diameter of the spots ranged from 1 to 6 mm, and they contained a high percentage of pollen.

The suggestion that the spots might be faecal deposits from honeybees on cleansing flights has recently been investigated by Nowicke and Meselson³, who examined samples of 'yellow rain' spots collected between 1981 and 1982 at sites of alleged chemical attack in Laos. What follows is taken from their report³. The 11 samples contained a high proportion of pollen, and all pollen grains identified came from types (or families) of plants common in south-east Asia. No two samples examined had the same composition of pollen types and even those adjacent on the same leaf were different. It is suggested that spots disseminated from an artificial source would not be expected to show such differences.

Pollen was also examined from the faeces of bees, from bees themselves, and from honey. Faeces of *Apis cerana* and *Apis dorsata* on leaves collected in 1983 near Pune, India, resembled spots from 'yellow rain' in general appearance, high pollen content, variation in pollen composition from one spot to another, and the presence of fungal hyphae and bee hairs.

An abdomen of one *Apis cerana* contained pollen of at least three types, one matching in form and range of variation a type in a sample of 'yellow rain' spots. One sample of honey from Chiang Khan and one from Nakhon Phanom were examined, both purchased in 1983 at villages on the Thai-Laotian border. The first sample of honey contained seven of the pollen types also found in the 'yellow rain' samples, which shows that these pollen types are gathered by bees in south-east Asia. The second sample of honey had at least ten pollen types, but none matched those in the 'yellow rain' samples.

Their observations led the authors of this report to conclude that the samples they examined were probably honeybee faeces. They present no evidence that 'yellow rain' samples were associated with mycotoxins.

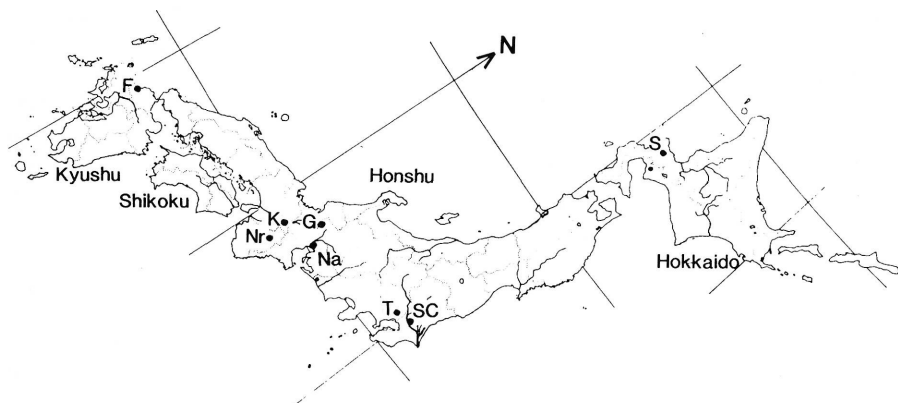


FIG. 1. Sketch map of Japan.

F.	Fukuoka	Nr.	Nara
G.	Gifu	S.	Sapporo
K.	Kyoto	SC.	Science City
Na.	Nagoya	T.	Tokyo

Prefecture (tel. 0584-64-4111). In 1981 Mr. Kenitsu Kishino, President of this firm, was instrumental in getting support to set up a Bee House Museum in Tsubakibora, Gifu, which is open daily 9.30–16.30, free of charge. It is small, and designed as an educational facility, with good displays about bees and beekeeping, and a television screen on which films are shown. In the historical section, I was interested to see an ornamental upright log hive reminiscent of those in Poland—but from Korea, with a carved and painted dragon circling splendidly round the log. In 1960 a sculpture by Osamu Tejima was erected with three figures—mother, daughter and son—looking upwards at a relief of a honeybee. It is in a small park by the Nagara river, at the foot of Mount Kinka.

Gifu fishermen catch *ayu* fish in the river here at night; fish are attracted by a flare, and trained cormorants are used to bring them to the boat. This use of a bird to collect food for human beings is in principle rather similar to the use of bees to collect nectar. But the bees carry out a further important activity in elaborating and storing honey from the nectar before the beekeeper takes his harvest. The cormorants have to be fitted with a neck-line to prevent their swallowing the fish.

Kyoto and Nara, both ancient capital cities of Japan and the greatest centres of sightseeing, are within easy reach of Nagoya by train. Visitors can enjoy seeing traditional gardens, temples, exhibitions—and traditional food and dress.

Tokyo area

There is nothing of beekeeping interest in Tokyo itself, but the government extension service for beekeeping is centred at the Apicultural Laboratory, National Institute of Animal Industry, Kukizaki, Inashiki-gun, Ibaraki Prefecture, about an hour by train

north-east of Tokyo. The Institute is part of a vast new complex being developed into a Science City, with a well run information service. Architecture is modern and exciting, and buildings (including the Apicultural Laboratory) are lavishly equipped.

Two hours north of Tokyo, Nikko is a centre of strawberry growing in greenhouses, as well as a rich centre of shrines and temples. An IBRA Member who would help visitors there is Mr Daisaku Shimotori, c/o Shimotori Yohoen Co. Ltd, 2-9-33 Chuou, Ohtawara-shi, Tochigi Prefecture (tel. 02872-3-38387). He supplies hives for pollinating strawberries in the greenhouses.

Meet the beekeeper

Two IBRA Members are hosts in Japan under this Scheme. Mr Toshio Fujiwara lives in Akita Prefecture in the north of Honshu, at 55 Kanaiden, Ohtamachi, Senbokugun (tel. 01878-9-1711). Mr Teizo Nonogaki is at Okumachi, Ichinomiya-shi, Aichi-ken (tel. 0586-62-0905). Okumachi is about 40 minutes by train from Nagoya, on the line to Tamanoi. Arrangements to visit him should be made through IHS (see below).

Apicultural research

IBRA Members would be welcome to visit the Institute of Honeybee Science (IHS), by previous arrangement. It is in the Faculty of Agriculture, Tamagawa University, Machida-shi, about 30 km west of Tokyo. IHS houses the Branch of the IBRA Library for Oriental Asia, a compact and effective working collection of books, reprints, journals, index cards, and colour slides.

Professor Ichiji Okada has been Head of the Department since 1949, and the development of the work on bees there has been more or less contemporary with the development of IBRA. There has been a close liaison between the two organizations ever since 1955, when Dr F. B. Paddock in Iowa, USA, recommended cooperation with IBRA—as it then was—to Dr Okada, who served on IBRA Council from 1973 to 1979. Altogether 15 members of staff from different Laboratories in the Faculty take part in lecturing and in research at IHS.

Research on various species of *Apis*, and on other bees, is carried out at Kyoto University; at Kyushu University in Fukuoka in the south of Japan; and at Hokkaido University in Sapporo in the north.

Apis cerana

In Japan 'beekeeping' normally refers to the use of introduced *Apis mellifera*. It is seventy years old, and is nowadays entirely separate from the keeping of the native *Apis cerana* in hives. The latter is not at all easy for visitors to see. In Honshu, *Apis cerana* exists in certain hilly regions, notably on the peninsula south of Kyoto and Nagoya (Wakayama and Mie Prefectures), and north of Mount Fuji.

It is a traditional type of beekeeping, and fixed-comb hives are still used—logs or wooden boxes. They are used either vertically—honey being taken from the top or from the (open) bottom—or horizontally, in which case one of the sides is removed. There seems little interaction between *mellifera* beekeeping and *cerana* beekeeping, and almost no-one keeps both species, whose geographical distributions hardly overlap at all.

Bee plants

Japan is about 3000 km from south to north. Subtropical crops in the south worked by bees—and some pollinated by them—include oranges and tea in the plains and persimmon (*Diospyros kaki*) on hillsides. Orange and tea plantations extend north of Nagoya. Milk vetch grows in flat valley lands that have not yet been taken into cultivation or built on. Farther north Japanese horse-chestnut (*Aesculus turbinata*) is a good honey source, and also Chinese sweet chestnut (*Castanea pubinervis*). *Robinia pseudacacia* is a fairly widespread minor source, as are red and white clovers (*Trifolium pratense*, *T. repens*).

A list of honey and pollen sources, together with much other information about Japanese beekeeping, was published in *Bee World* 1982 (pp. 60-71) by Professors Tetsuo Sakai and Mitsuo Matsuka at IHS. Dr Sakai is a Member of IBRA Council, and Dr Matsuka our Regional Representative for Japan.

Language difficulties

Visitors to Japan must not expect to see many more street signs, notices, etc., in their own language than a Japanese would find in the visitors' own country. Travelling by car, bus or train can therefore present difficulties, although many Japanese are delighted to have an opportunity to help foreign visitors. English is the second language taught in Japan, and many people—including all university students—have a working knowledge of it for reading and even writing. But only those who have lived in an English-speaking country have enough experience of pronunciation and stress to use English in conversation. At the Congress the few Japanese beekeepers and bee scientists with fluent spoken English will be very hard worked, and may well need to restrict their time to organizational matters.

EVA CRANE