

# Wider aspects of a career in entomology.

## 22. Japan

Hugh V. Danks

*This series of articles outlines some ancillary aspects of my entomological career. The approach includes information about insects and their environments, conclusions about scientific activities and their setting, and general observations. This article is based on my visits to Japan in cooperation with Japanese colleagues.*



My first link with Japan came from rearing a Japanese silkmoth when I was a young amateur entomologist. However, it was not until 1992 that my professional interests took me to that country to visit several establishments known for research on insect seasonal adaptations.

Later travels encompassed similar activities as well as a conference on the same subject, lectures to university students, and involvements with a potential biology textbook for Japanese high-school students. Subsequently, I lived in Japan for 5 months (2004–2005) as a visiting foreign professor, with short forays to many other localities in both professional and personal capacities. A final brief trip towards the end of 2005 resulted from another specific invitation. The places visited on those journeys are shown in Figure 1.



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Figure 1. Sites in Japan that were visited in 1992–2005. Locations for sightseeing rather than mainly professional activities are shown in smaller type. Base relief map from Bourrichon (CC BY-SA 2.0).

**Danks, H.V. 2023. Wider aspects of a career in entomology 22. Japan. (pp. 1–10, 8 February 2023)**

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The professional contacts were rewarding academically, but in addition time spent in Japan greatly broadened my general and historical knowledge. For example, it showed how language, history, culture, and the structure of society influence achievements, professional development, personal relationships, and other elements.

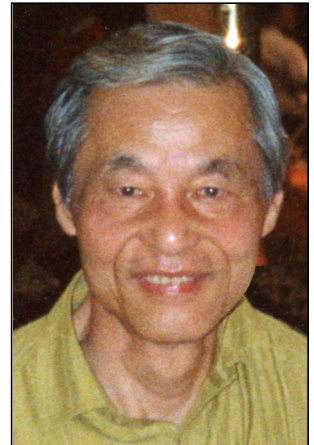
My 1992 visit took place immediately after the International Congress of Entomology in Beijing, China, where I participated in a congress symposium that had been co-organized by Professor Sinzo Masaki<sup>1</sup> (Figure 2). Prof. Masaki kindly facilitated my subsequent itinerary in Japan, which started at his university in Hirosaki<sup>2</sup>. Visits elsewhere were hosted by other entomologists, some of them former students of Prof. Masaki.

Prof. Masaki was an outstanding scientist and educator, with a broad international viewpoint and a generous personality. We were interested in the same broad range of subjects, and his extensive work on seasonal adaptations had figured prominently in my 1987 book on insect dormancy<sup>3</sup>.

He worked especially on crickets (e.g., Figure 3), and discovered key concepts. Many of his findings stemmed from painstaking work involving daily checks of large cultures of crickets from different latitudes. Prof. Masaki installed a facility at his home for these inspections (which he continued long after retirement), and during the daily routines would try to improve his English by listening to educational recordings.

At each institution I presented one or two seminars about dormancy, and conversed—in English—with entomologists and their

Figure 3. Emma field cricket, the gryllid *Teleogryllus emma*, one of the species studied in detail by Prof. Masaki.



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Figure 2. Professor Sinzo Masaki, photographed at the International Congress of Entomology in Beijing in 1992.



Phonon.b (CC BY-SA 4.0)

<sup>1</sup> In Japan, given names follow family names (Masaki Sinzo), although English speakers expect given names to be first. Sinzo was Prof. Masaki's preferred transliteration, but another common way to render this Japanese name in English is Shinzō.

<sup>2</sup> At a dinner for symposium participants, Prof. Masaki confessed to me that he was worried about my forthcoming trip. "Japan", he declared, "is the most bureaucratic country in the world." Immediately, a participant from Germany disagreed: "Germany is surely the most bureaucratic country in the world." People from Sweden and other countries were all then anxious to explain why *their* country should be regarded as the most bureaucratic. I was not able to exclude Canada from this list! Evidently, organizations everywhere have a tendency to emphasize paperwork, process, and control.

<sup>3</sup> I discovered that although Prof Masaki had been invited to make a plenary address about dormancy to the 1988 International Congress of Entomology in Vancouver, he chose an alternative theme, telling the organizers that my recent book had covered the subject (and it was from Canada). Moreover, many books were purchased from Japan, and proved to have been ordered by Prof. Masaki. His generous nature was confirmed when he told me during my 1992 visit that the book, with its detailed tables, was more useful than another one on the same subject published at about the same time—of which he was one of the (three) authors! [[Insect dormancy](#) is posted online by the Biological Survey of Canada.]

students (and other scientists) about active research. A remarkable amount of related work was underway, covering diapause responses, their control by photoperiod and other factors, geographical variation, the possible basis and physiology of the biological clock that provides daily and seasonal timing, and elements of cold hardiness. Various life stages of mites, spiders, grasshoppers, butterflies and moths, bugs, flies, and other insects were all being studied. There are also many amateur entomologists in Japan, and other people too appreciate the beauty and interest of insects.

Japan differs markedly from elsewhere in population, culture, and language. About 125 million people live on its 378 000 km<sup>2</sup> (the population is slowly decreasing). Canada's population is increasing, but there are only about 37 million people on nearly 10 million km<sup>2</sup>, more than 26 times the area of Japan. Of course, most residents of Canada occupy warmer areas within 200 km of the southern border, and much of the area is uninhabited (less than 10% of the land is suitable for farming, for example). However, three-quarters of Japan is rugged and mountainous (compare the relief shown in Figure 1), and most dwellings are confined to the coastal plains (cf. Figure 4).

The density of the Japanese population was evident when I flew from Sapporo to Osaka during my tour, and discovered that the route had frequent service by large jet aircraft. Mine was a Lockheed L1011 TriStar, a plane that can carry several hundred passengers; and the flight was full.

About 14 million people live in the capital, Tokyo. To serve them, thousands of municipal government employees work in a complex that occupies three city blocks and rises up to 48 storeys high, with three more storeys below ground.

I stayed overnight in that city with a Japanese colleague, before travelling with him on Monday to his research institute about 70 km away. He spent weekends in Tokyo with his wife (who worked there), but lived all week near his workplace in Tsukuba Science City. He said we should start our drive early to dodge the worst of the traffic jams, and then I understood his weekly schedule. The one-way journey lasted for about three hours, and even so my host

confirmed that we had saved a substantial amount of time by leaving early.



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Figure 4. Japanese city built on flat coastal lands (Tsu).



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Figure 5. Crowded shopping area (Tokyo).



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Figure 6. Modern shopping mall (Okayama).

Some sections of the route were faster, and an alarm sounded whenever the speed exceeded 100 km/hr. At the time such an alarm was required on cars in Japan. Avoiding the constant noise must be a useful constraint for drivers, I thought. Maybe for some, said my host, but others like to hear it because it proves that they are travelling excitingly fast!

Japan is a mixture of contrasts. On one hand are the frantic traffic and packed subways of Tokyo, noisy arcades with *pachinko* (mechanical games used for recreation and gambling), city crowds (Figure 5), and modern shopping malls (Figure 6).

On the other hand, there are quiet sections in the older parts of many towns (Figure 7), and small rice fields (Figure 8) are associated with some dwellings.



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Figure 7. Street showing historic buildings (Sakawa, Kochi).



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Figure 8. Small rice field between buildings, as found in many areas (Yamaguchi).



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Figure 9. Sample elements of classical Japanese gardens (-en): Structured layout (top); and two trees trained to aesthetic shapes (Kōraku-en, Okayama).

Also contrasting with the bustling populations are opportunities for quiet reflection. Japanese gardens (e.g., Figure 9) are renowned for their serenity and meticulous maintenance. In places, zen components (e.g., Figure 10) favour silent contemplation.



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Figure 10. The dry-sand zen garden at Ginkaku-ji (Jishō-ji), Kyoto, showing raked patterns, and a 2m high cone, of white sand.



Figure 11. Japanese shrine (usually *-jinja*): Characteristic gate (*torii*) of a Shinto shrine, with the hall of worship beyond it (top); and hall for the *kami* [beyond the hall of worship] (Okayama-jinja, Okayama).



Figure 12. Japanese temples (usually *-ji* or *-dera*): Characteristic gate of a Buddhist temple (top, Daikō-ji, Nagasaki); and part of a Buddhist temple complex, including the pagoda (Hōryū-ji, Nara).

The country has a rich history, and culturally important elements are conspicuous. They include shrines and temples<sup>4</sup> (e.g., Figures 11 and 12), castles (e.g., Figure 13), monuments (e.g., Figure 14), and museums, in addition to gardens.

The history and dense population of Japan have greatly influenced cultural norms and interpersonal relationships. In particular, conformity and social harmony are highly valued. Hosts make considerable efforts to avoid any discomfort among their guests—a trait from which I profited because some customs were unfamiliar to me, despite my attempts to learn beforehand about potential missteps<sup>5</sup>.

Because smooth interpersonal relationships are so significant, the Japanese like to understand the nature of the people they are dealing with, not just technical or other aspects of science or business, for example.

<sup>4</sup> Shrines are places of worship for *Shintō*, the native religion of Japan. They house *kami* (venerated entities, which include concepts and spirits as well as objects linked with nature, for example). Temples are places of worship for Buddhism, introduced in the 6<sup>th</sup> century. The relationship between these religions has been complex, but many shrines are associated with temples. There are about 100 000 shrines and 80 000 temples in the country, and many people subscribe to elements of both religions.

<sup>5</sup> For example, I did know that it is rude to blow one's nose in public, and it is unforgivable to do so during a meal. However, at one international seminar in Japan that I attended, a hulking foreign delegate, completely oblivious, blew his nose with enormous gusto during a meal—but the hosts managed to conceal their disgust so as not to discomfort him.



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Figure 13. Japanese castles (*-jō*): Hirosaki-jō, completed in 1611, main tower rebuilt in 1810 (top); and Okayama-jō, completed in 1597, concrete replica built in 1966.



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Figure 14. Statue of Shintarō Nakaoka, a samurai of historical importance (Muroto).

Typically, individuals try to get to know each other informally beforehand, often at a restaurant or bar (e.g., Figure 15). Carefully chosen sightseeing interludes are planned for guests.

After seminars, institutions typically hold informal “parties” (Figure 16). Official visits and meetings generally include meals or formal banquets. Most institutions serve alcoholic beverages during such social gatherings, but the functions end early, preventing disruption of schedules or future work. Excellent hospitality was provided in these and other ways by the entomologists who hosted my visits in 1992.

My hosts are shown in Figures 15–17, and their main research interests are noted in the captions. Some of the sightseeing trips were conducted by students, allowing detailed entomological conversations at the same time.

Politeness is an important aspect of social interactions. One example is the striking frequency of interjections (*aizuchi*) during Japanese conversations that indicate the listener is actively paying attention.



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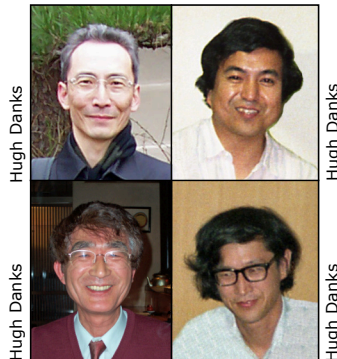
Figure 15. Gathering at a sake bar in Kobe, 1992. At front L is my host there, Dr (now Prof.) Makio Takeda, who studied especially the physiology of diapause control.

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Figure 16. “Party” in Tsukuba, 1992. Next to me is Dr (now Prof.) Takashi Okuda, who helped me on more than one trip, and who worked especially on anhydrobiosis in the African rock-pool chironomid *Polypedilum vanderplanki*. Next to R is Dr (now Prof.) Seiji Tanaka, another of my hosts in Japan, whose work included studies of diapause and its physiology, and of wing form and other topics, in various insects including Orthoptera.

Figure 17. Other entomologists who hosted my visits in 1992. L and R from top to bottom, Dr (now Prof.): Hideharu Numata (Osaka), whose extensive research on seasonal adaptations covered many subjects, including the physiology and control of diapause in bugs and other taxa, and who hosted me on subsequent visits as well [this image is from 2004]; Minoru Ishii (Osaka), who was involved in a range of topics, especially in Lepidoptera; Akio Takafuji (Kyoto), who studied the diapause of mites and their biology and control, especially phytoseiids; Masahito Kimura (Sapporo), who worked mainly on drosophilids, and investigated cold hardiness, diapause, and other features.



The interjections, meaning *yes, yeah, is that so?, ah, hmm, I see,* and *right*, for example, as well as repeated nodding, just show good listening, not agreement—which can lead to misinterpretation by foreigners!

People who are silently attentive (like English speakers taught not to interrupt) therefore make Japanese uncomfortable, because the speaker believes his listener is distracted, or unhappy with what is being said.

Early in the first trip, my focus on the speaker during a private conversation led him to ask me why I was silently staring at him. When told I was simply paying attention, he explained that staring at someone in Japan means that “you either want to fight them or make love to them”!

The requirement for politeness means that disagreement is seldom expressed overtly. Instead, it might be signified by a pause, a sharp intake of breath, or a response such as

“perhaps”. The lack of verbal disagreement confuses westerners who might believe, for example, that a particular outcome is almost assured when it definitely is not. Meanwhile, the Japanese participants believe that they have delivered the opposite message.

During my 1992 visit, I was invited to write a paper for a volume honouring Prof. Masaki, and had to consider whether time and content would make it feasible. A Japanese colleague (trained partly in the United States) inquired whether I planned to contribute. When told I was thinking about it, he asked me if that was a Japanese “thinking about it” [meaning no], or an English “thinking about it” [meaning thinking about it]!

The culture of politeness is reflected in Japanese jokes, which may relate to the importance of manners and do not resemble most North American humour. Moreover, when I told such a

joke<sup>6</sup> (one of my few more or less fluent paragraphs of Japanese!), the senior man present saw the punchline coming just before it was delivered, and said “ah, I get it” during the joke. This Japanese-style interaction would have been unlikely from an English speaker.

The Japanese language itself reflects formalities of social structure. Different endings and even words are used to show appropriate levels of respect, depending on whether individuals of high rank, customers, strangers, subordinates, young people, friends, or relatives are being addressed. Humble words are used to refer to oneself.

It is almost impossible for someone not raised in Japan to grasp all of the niceties of such usage. However, I learned a little Japanese before my first trip, and more later, in the standard polite form. That fascinating exercise roiled my existing concepts of language.

Japanese is one of the most complex written languages in the world. It uses both kanji (e.g., Figure 18), which represent words and originated mainly from Chinese characters, and kana, which represent syllables and were developed in Japan. No space is left between characters.

Most kanji have several meanings, and are read differently for each meaning, although there may be only one or a few common readings. Nearly all kanji also have two readings for the same meaning (and the one used may depend on whether the character is part of a compound). About 3 000 kanji are in regular use, alone or compounded in more than 10 000 common words.

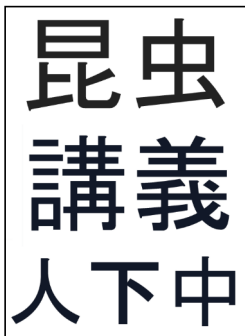


Figure 18. Examples of Japanese kanji:

The kanji combination for insects (top), which is read *konchū*; the second kanji is commonly used alone, and read *mushi* [meaning bugs in the wider sense];

The kanji combination for lecture (middle), which is read *kōgi* [meaning an instructive talk];

Three simple kanji (bottom), with the common meanings (L to R) of person, below or down, and inside or middle.

The first character of “lecture” (講) demonstrates how kanji are made up of building blocks or radicals: the left-hand part represents “speaking” (言), as shown by the “mouth” (口) below.

All characters must be written with a fixed number of strokes, in a fixed order, and in fixed directions. Those shown here require 8 and 6, 17 and 13, and 2, 3, and 4 strokes respectively. Characters were written originally with a brush, giving the strokes distinctive features such as variable thickness and “tails” at the end, which are largely missing in this printed font.

There are two syllabaries: hiragana, used for native words and for various grammatical elements; and katakana, used mainly for words borrowed from other languages. Figure 19 shows a few sample characters. Each syllabary has 46 base syllables, and combinations, and the addition of diacritic marks, gives all of the phonetics (about 100) used in the language.

Nearly all of the syllable sounds are similar to English, and can be rendered as consonant(s)-vowel combinations (such as *ka*, *ki*, *ku*, *ke*, *ko*), the five vowels, and *n* as a separate syllable. This scheme allows Japanese to be written phonetically in roman characters—termed *rōmaji*<sup>7</sup>—as in the captions of Figures 18 and 19. All Japanese learn *rōmaji* in addition to kanji and kana.

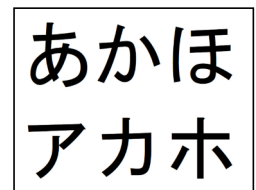


Figure 19. Examples of Japanese kana: The syllables *a*, *ka*, and *ho* in hiragana (top, L to R); The same syllables in katakana (bottom).

<sup>6</sup> Tanaka and Yamada went to a restaurant and ordered steak. When it came, one piece was large and one was small. Immediately, Tanaka took the large piece. Seeing this, Yamada was furious. “What a rude person you are”, he said. “Don’t you know that if you take the first piece you should take the small one!” Hearing this, Tanaka asked: “So what would you have done?” “I’d have taken the small piece, of course!”, Yamada responded. “What are you complaining about, then?”, said Tanaka. “You’ve got it, haven’t you?”

<sup>7</sup> Even so, there is more than one system of transliteration. For example, the syllable *si* is pronounced *shi*, and different systems use one or the other (cf. footnote 1). Three alternatives for a long *o* (representing *oo* or *ou* in Japanese) are *ō*, as first learned in the Japanese system, *o*, originally used in the West, and *ō*, now the usual form there. In English, however, place names do not normally distinguish *o* and *ō* (as in *Kōchi*, *Kyōto*, *Ōsaka*, and *Tōkyō*).



Kanji readings can be reproduced with the Japanese syllables as well as rōmaji, of course. However, in either case information may be lost because many different kanji sound the same. For example, *chūmon* 注文 means order (in the sense of ordering food), and *chūmon* 中門 means middle gate (as at a temple). Apart from the context, they cannot be distinguished when written in rōmaji, nor in hiragana ちゅうもん [*chu[chiyu]-u-mo-n*].

In the spoken language, many words can be differentiated through the contrast between higher-pitch or accented syllables and those that are lower-pitch or unaccented, although meanings may be clear from the context. Thus, *hashi* (↑) means bridge, and *hāshi* (↓) means chopsticks ... and no one eats with a bridge or crosses the river on chopsticks!

The order of Japanese sentences differs greatly from English. Among other features, the main verb comes at the end, and only then can the listener distinguish past or present tense and whether the sentence is indicative or interrogative.

Syntax relies heavily on the use of small “particles”, which show the roles of words in the sentence. Each particle marks the word it follows as subject or object, for example, or indicates its connection to possession, position, direction, or interrogation<sup>8</sup>. Particles are written in hiragana, and most common ones are single characters (e.g., *ga*, *ni*, *ka*).

These features make the Japanese language especially challenging for English speakers. Some usages are potentially confusing as well. For example, in response to a negative question such as “Aren’t there any apples?”, English speakers reply No, meaning indeed there aren’t any. Japanese speakers reply Yes, meaning the negative thing you said is true.

Japan is relatively homogeneous in language and culture, but the language does have local dialects. During a bus ride to Hirosaki, Prof. Masaki reported that the divergent rural accent of two nearby passengers was so unusual that he could barely understand them.

My 1992 trip to Japan was extremely rewarding from a scientific perspective. I concluded that one major reason for the remarkable amount of Japanese research on insect seasonal adaptations was the impetus provided by Prof. Masaki’s roles in research and education. He and his colleagues and former students, the students they trained in turn, and others stimulated by his work, continued similar research for many years.

I profited equally from exposure to the unique culture and social structure of Japan. My experiences and observations of societal norms and language also greatly assisted future interactions with Japanese colleagues. Subsequent articles in this series will outline additional cultural and professional encounters.

<sup>8</sup> A few elements of the language can be seen in the first sentence of the joke introduced above (footnote 6). “Tanaka and Yamada went to a restaurant and ordered steak”—normally a mixture of kanji, hiragana, and katakana—can be written in rōmaji (with extra spaces added to show sections of the sentence) as: “*Tanaka-san to Yamada-san ga resutoran e itte bifuteki o chūmon shimashita*”. This structure is *Tanaka-san* [rude not to have the honorific *-san*] *to* [and] *Yamada-san* [with honorific] *ga* [subject marker, showing these people are the subject of the verb]; *resutoran* [restaurant, an adopted foreign word] *e* [direction marker, meaning to(wards)] *itte* [to go, in the verb form used when another verb follows in the same sentence]; *bifuteki* [beefsteak, another adopted foreign word] *o* [object marker, showing steak is the object of the verb] *chūmon* [order] *shimashita* [main verb (meaning to do, etc.), with past tense ending], hence “ordered”, and the verb in mid-sentence is translated as “went”. Simply adding the particle *ka* after the final verb [where it would serve as a question marker] changes the sense to “Did Tanaka and Yamada go to a restaurant and order steak?”

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*Hugh Danks retired in 2007 after many years as head of the Biological Survey of Canada. In that role, he helped to coordinate work on the composition and characteristics of the arthropod fauna of the country, and to summarize the results. In addition, his research studied cold-hardiness, diapause, and other adaptations to seasonality in northern regions.*

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**Nos. 1–20 published in [Bulletin of the Entomological Society of Canada](#).**

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