

Craft History and the Merging of Tool Traditions: Carpenters of Japanese Ancestry in Hawaii

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For centuries the Japanese have made extensive use of wood as the main raw material in the construction of houses and their furnishings, temples, shrines, and fishing boats. As a wood-worker, the carpenter is one of the most ancient of Japanese specialists. He developed a complex set of skills, a formidable body of technical knowledge, and a strong tradition of craftsmanship to be seen and appreciated in the historic wood structures of contemporary Japan.¹

The first objective of this study of carpenters of Japanese ancestry in Hawaii is to throw light on how the ancient Japanese craft of carpentry was transplanted from Japan to a new social, cultural, and economic environment in Hawaii through the immigration of Japanese craftsmen and the subsequent training of their successors born in Hawaii. Despite its importance for the understanding of economic growth and development, the craft history of Hawaii has not received the attention it deserves. The second objective of the study is more anthropological in nature and is an attempt to analyze how two distinct manual tool traditions, Japanese and Western, met and merged in Hawaii to form a new composite tool tradition. This aspect of the study falls in a larger field dealing with the history of technology and of tool traditions in general.

Carpentry today, both in Japan and in the United States, relies heavily on power rather than hand tools. Also, carpenters tend to be specialized, and construction is to a major degree a matter of assembling prefabricated parts. We are here concerned primarily with a time period prior to the

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mid-1950s and with a group of Japanese craftsmen in Hawaii thoroughly proficient in the use of hand tools. In Hawaii today most of these men are either retired or deceased, so opportunities for participant observation were very limited. Our data are derived from interviews with retired or semi-retired Japanese carpenters on Oahu, the authoritative knowledge of the senior author, and the relatively meagre Hawaiian documentary sources. In Japan there is a considerable scholarly interest in traditional crafts, so that we have been able to use background material on Japan published either in Japanese or in English.²

This paper is limited to three classes of Japanese carpenters in Hawaii. The first class comprises those who were primarily engaged in residential construction or in the finer work associated with larger commercial and public buildings. The second class includes the shrine and temple builders. Historically, in Japan these were the elite of the first class, master carpenters who built both residences and religious structures but who in Hawaii became known for their skill in the traditional joinery and construction that shrine and temple building demanded. The third class consists of the builders of commercial fishing boats, which in both Japan and Hawaii required special skills and knowledge. A fourth class, the furniture makers, we have not attempted to include.

Japanese immigration to the Hawaiian Islands forms the demographic context of this study. The first immigrants arrived in 1868, when a small group of 148 individuals was brought in a poorly planned attempt to procure labor for the sugar plantations. Sixteen years later, the Hawaiian census of 1884 listed a population of 80,578 for the entire kingdom, of which 116 were Japanese, including members of the 1868 migration and their descendants. It was not until 1885 that the organized migration of Japanese labor to the sugar plantations of Hawaii began. This first organized movement of contract labor, initially under government and later under private auspices, lasted until 1900, by which time the Japanese population had reached 61,111 or 39.7 per cent of the total population. Immigration from Japan continued during a voluntary immigration period, 1900-1907, and a restricted immigration period, 1908-1924; it was terminated by the Immigration Act of 1924.³ By 1950 the population of Japanese ancestry had reached 184,598, amounting to 36.9 per cent of the total population of the Hawaiian Islands.⁴

By the turn of the century a movement off the plantations was already under way, as the Japanese established themselves in diverse occupations in towns as well as in the rural countryside. Also, after 1900 Japanese immigration was by no means confined to the plantations. By 1920, although 73 per cent of the Japanese in Hawaii were still living in rural

areas, 22.4 per cent were residing in Honolulu and 4.4 per cent in Hilo.⁵ In the next two decades the pattern of residence changed drastically. In 1940 more than half of the Japanese population lived on Oahu, reflecting the ever-increasing pre-eminence of Honolulu as the hub of the islands' economic, social, and political life.⁶

THE JAPANESE CARPENTRY TRADITION IN HAWAII

The introduction into Hawaii of Japanese traditions of carpentry and cabinet-making was an important consequence of Japanese immigration. The 1868 contingent of immigrants included at least one carpenter, Kakujiro Mitsuhashi, whose descendants live in Hawaii today, but it was the large-scale immigration beginning in 1885 that was responsible for the first substantial transfer of Japanese carpentry skills to Hawaii. Some plantation laborers who came between 1885 and 1900 must have had a knowledge of carpentry. In Japan they were reared in rural agricultural communities, where basic carpentry was part of the life of many farmers, who as a community tradition gave one another mutual help in the construction and repair of their houses. After arrival in Hawaii, in time some became plantation carpenters, although this process cannot be precisely documented. By 1900 a sizeable number of Japanese carpenters were employed by the sugar plantations, while other individual carpenters worked independently in rural communities.

After 1900 Japanese immigrants included men who were fully qualified carpenters when they arrived, who then continued to practice carpentry as a full-time occupation. Some worked as carpenters for plantations and others were employed by construction firms, large and small.

Two more specialized types of carpenter also came to Hawaii. One type comprised the boat-builders, whose specific task was to construct boats for the commercial fishing fleet. Japanese involvement in commercial fishing began in a modest way about the turn of the century. With the opening of the tuna cannery in Honolulu in 1916, commercial fishing by Japanese was much stimulated. Fishing boats were needed and were locally built by Japanese carpenters to designs that were basically Japanese although modified as time went on.

The second group of specialized carpenters consisted of the shrine and temple builders. When Japanese immigrants had formed communities able economically to express their traditional values and customs in their new homeland, they employed master carpenters from Japan, who directed the building of shrines and temples in Hawaii in accordance with time-honored Japanese architectural forms and methods of con-

struction. On completion of their assignments these master carpenters generally returned to Japan, after imparting considerable knowledge to their local assistants. The temples and shrines themselves were distinctive architectural contributions to the Hawaiian scene.

Census Data on Carpenters in Hawaii

Published census data give only a fragmentary picture of change in occupational categories through time, but help to illuminate the movement of Japanese in Hawaii into skilled crafts.

The 1884 census of the kingdom presents a rudimentary classification of the population by occupation. For the islands as a whole, a total of 264 carpenters are listed, of which 71 were Hawaiians, 15 were Chinese, and the remaining 178 were lumped into an "other" category about which details are lacking. Similarly, in 1884 there were 31 cabinet-makers; 15 of these were Chinese and 16 were in the "other" category.

The U. S. Censuses of 1900, 1920, and 1930 provide figures for occupation and nationality combined. These figures reflect the movement of the Japanese in Hawaii into skilled occupations. The following census data on carpenters are for Hawaii as a whole.

TABLE I'
CARPENTERS AND JOINERS

<i>Year</i>	<i>Japanese</i>	<i>Chinese</i>	<i>Hawaiian and Part Hawaiian</i>	<i>Others</i>	<i>Total</i>
1900	649	334	433	539	1,955
1920	1,832	255	337	466	2,890
1930	2,793	193	241	568	3,795

Thus by 1920 the Japanese in Hawaii clearly predominated in carpentry. In the 1940 and subsequent censuses, separate figures for carpenters by nationality or ethnic group were not published. The 1940 census lists a total of 4,072 carpenters, of which two were female. More than half of this total (2,043), including the two females, lived in Honolulu, reflecting the growth of the city and the onset of defense work associated with World War II.

For the years 1900, 1910, and 1915, the Reports of the Commissioner of Labor for Hawaii include some interesting figures on the nationality of craftsmen employed on the sugar plantations. Two crafts particularly

important for plantation operations during that period were carpentry and blacksmithing, into both of which the Japanese moved. The initial group of carpenters on the plantations seems to have been a heterogeneous lot. Thus in 1900 the non-Japanese carpenters in a sample of 38 plantations included 33 Hawaiians or part-Hawaiians, 43 Chinese, and 70 "others," including Americans, Canadians, Irish, English, Germans, Norwegians, Swedes, Welsh, New Zealanders, and Spaniards. Japanese carpenters numbered 517 in the same year, nearly 78 per cent of all plantation carpenters in the sample. The percentage of Japanese plantation carpenters remained virtually unchanged in 1910 and 1915.⁸

The increase in the number of carpenters in Hawaii prior to World War II was related to the fact that residential construction was mainly of wood. Extensive use of concrete and masonry was found mainly in large public, church, and commercial structures. Although most construction lumber was imported from North America, Hawaii did possess in considerable abundance two fine native hardwoods, *ohi'a* (*Metrosideros collina*) and *koa* (*Acacia koa*), for cabinet-making, doors, flooring, paneling, and special architectural details.

PERPETUATION OF THE CARPENTER'S CRAFT: APPRENTICESHIP IN JAPAN AND HAWAII

For any craft to endure, an institutionalized means must be devised to ensure the transmission of the craft from one generation to the next. This means or mechanism usually takes the form either of an apprentice system or a school incorporating a formal course of instruction, or some combination of both. The long-established practice in Japan was based on apprenticeship.

The apprentice system has ancient roots in Japanese society. During the Tokugawa period, the master-apprentice relationship became highly institutionalized as a pervasive aspect of Japanese education as a whole. Knowledge in virtually all domains was acquired by apprenticeship to a master. Apprenticeship became not only a formal method for the transmission of knowledge from one generation to the next, but was also a means of training the young for the responsibilities of adult life.⁹

After the Meiji Restoration, and with the ensuing industrialization and urbanization of Japan, as well as with the growth of universities and

FIG. 1. Carpenters in 19th-Century Japan. Photograph taken by Edward S. Morse, probably in the late 1870s. From the Morse Collection, Peabody Museum, Salem. Courtesy of the Peabody Museum, Salem.



1589 Carpentiers.

technical schools and the emergence of large business firms, the apprentice system lost its all-pervasive nature. Yet in numerous crafts, including carpentry, the old system retained its vitality until World War II, and in some specialized and long-established occupations, such as pottery-making and lacquer-making, survives to contemporary times.¹⁰

The apprentice system in carpentry possessed social and economic features common to traditional apprenticeship in other areas of Japanese life. A young apprentice became part of his master's household in a quasi-familial relationship. Following his apprenticeship, he continued to pay respect to his master, and in case a master did not have a son to succeed him, an apprentice might be chosen as his successor.

We were fortunate that two of our informants, Tetsuo Kubota, a master carpenter and shrine builder, and Tokushige Nakahara, a boat-builder, were born in Japan and underwent apprentice training there in the 1930s. The following description is derived from their accounts.

Mr. Kubota said that when he was a boy in Fukuoka, a village shrine near his home was being repaired and renovated. Out of curiosity, he watched the carpenters at their work on the shrine, even though they sometimes scolded him for being in the way. Later, after he had finished his basic schooling, Kubota's father arranged for his apprenticeship to the master carpenter who had been in charge of the shrine renovation. Kubota was sixteen years of age at the time. He remarked that arrangements for apprenticing a youth to a master were generally initiated and concluded between the master and the youth's parents and family, particularly when the parents wished their son to acquire his skill under a well-known master.

As an apprentice, Kubota lived in the house of his master and received lodging and meals but no pay. He was also expected to help with household chores in addition to construction work. The apprenticeship period was five years. When Kubota began his training, he was the only apprentice living in his master's household. About six months later, the master took into the household a second apprentice of the same age. When this happened, Kubota was called "elder brother apprentice" (*anideshi*) and the new apprentice "younger brother apprentice" (*otōtodeshi*), a distinction based not on age but on relative length of training.

Apprentice training consisted primarily of closely watching the master carpenter at work and thus learning by observing, and by following the master's orders. Formal instruction by the master was minimal but there was a sequence to the training. The apprentice first learned joinery, which involved the marking of lumber and the use of chisels in making

the numerous joints used in house construction. The apprentice also devoted much time to sharpening his own and the master's chisels to a razor-sharp edge. The master provided the apprentice with his own tools at no expense to the latter. Three years were devoted to the use of planes. The first year the apprentice was allowed to work only with planes on rough work and not until the third year did he learn fine finishing. In the final stages of his training, the apprentice was assigned a section of a house to complete to test his skill. Kubota recalled that as an apprentice he was so anxious to learn that he returned to the job site after dark and with a flashlight examined what his master had done during the day.

The relationship between "elder brother" and "younger brother" apprentices was an important one. The master seldom instructed directly, but an elder brother apprentice worked closely with younger brother apprentices at the job site. Thus the transmission of knowledge was not just between master and apprentice; it also flowed from the more experienced elder brother to the less experienced younger brother apprentices.

Apprentice training also involved an immersion in effective work organization. Thus in building a shrine, Kubota's master usually called in carpenters who had received their training from him. The job was of sufficient complexity to require not only special skills, but also the kind of teamwork resulting from the fact that all men, carpenters and apprentices, had trained under the same master and were familiar with the master's manner of organizing and carrying out the work necessary for the successful completion of the building.

Finally, after almost five years of training, the master allowed Kubota to enter into a contract to build a house completely on his own. However, the payment for the cost of the house was remitted to the master. The building of the house and the payment to the master is a tradition called *orei-bōkō*, or "appreciation service to the master." It signified the end of apprenticeship and the apprentice's transition to the status of independent, qualified carpenter.

Mr. Nakahara's apprentice experience was similar to that of Mr. Kubota. Nakahara completed about three and a half years of the regular five year period of apprenticeship to a master boat-builder in Japan before coming to Hawaii as a boatbuilder in the yard of Hawaiian Tuna Packers. As in Kubota's case, Nakahara lived with his master and received lodging and meals, helped with household chores, but received no pay. However, after three to three and a half years, it was customary for an apprentice boat-builder to receive some regular pay. Learning was

by watching and following instructions, and much time was devoted to tool-sharpening.

With the transfer of Japanese carpentry skills to Hawaii through immigration, what happened to the apprentice system as a new generation of young Japanese learned the craft?

In Hawaii an apprentice system was retained but lost most of the formal social features characteristic of apprenticeship in Japan. For example, only one informant trained in Hawaii, a boat-builder, lived in his master's household, in this case for four years. During this period, he received room and meals and helped with household chores as well as with boat-building, but received no regular pay. None of our other Hawaii-trained Japanese informants experienced this aspect of Japanese apprenticeship. In Hawaii the personal and quasi-familial contractual relationship between master and apprentice disappeared. Apprentices were paid as helpers and were employed, as was often the master carpenter himself, by a plantation or by a company engaged in construction or boat-building; or the apprentice was paid by the master in his role as the proprietor of a small carpentry shop or as a building contractor or boat-yard operator. A fixed time period for apprenticeship disappeared; an individual acquired his skill through his own motivation and alertness at his own pace. What persisted was the status and pay differential of master and apprentice and much of the manner in which an apprentice learned his skills. The latter emphasized learning through watching older carpenters at specific tasks and following their instructions, including a great amount of time sharpening tools. Our informants who were trained in Hawaii received all or part of their training from carpenters who had immigrated from Japan, thereby giving continuity to the manner of training despite the markedly different cultural milieu in which it took place.

An important point is that in Hawaii young Japanese men had to make the most of the limited job opportunities available in attempting to improve their economic circumstances.¹¹ This leads to a note on career paths.

CAREER PATHS IN HAWAII

Our sample of carpenters provides occupational life history data on fourteen individuals. Five of these were born and trained in Hawaii. Six were born in Japan but trained in Hawaii. Two were born and trained in Japan; and one was born in Japan but completed his apprenticeship under a Japanese master carpenter in Korea. One of the carpenters born

and trained in Japan and the carpenter born in Japan and trained in Korea moved to Hawaii after World War II.

The following seven brief vignettes are illustrative examples of carpenter's career paths.

Mr. A. was born in 1913 at Kekaha Plantation on Kauai. After his mother died, when he was seven years old, he was sent by his father to Japan to be cared for by relatives. Mr. A. returned to Hawaii in 1929 at the age of fifteen, graduated from McKinley High School in Honolulu, and thereafter started work as a carpenter's apprentice. The carpenters he worked under were first-generation Japanese, employed by a contractor of Japanese ancestry. The construction jobs on which they worked mainly involved house-building on Oahu. Mr. A. learned his craft by looking, doing, and following the instructions of older carpenters. All carpentry was done on the job site, including the cutting and planing of rafters and other framing members. Hand tools were exclusively used until about 1940, when a portable power saw, a table saw, and a portable generator were hauled to the construction site. In those days Mr. A. rode to work on a bicycle. It took two to three years to become a journeyman carpenter, but the time was variable, depending on individual ability. With the outbreak of World War II, Mr. A. worked for another employer on defense construction, principally building barracks. After the war he returned to civilian construction.

Mr. B. was born in 1909 at Kahalui, Maui. His father was a carpenter in Fukuoka and came to Hawaii with his wife in 1907 to work at Puunene Plantation on Maui, but by 1909 he was employed as a carpenter by Kahalui Railroad Company. As a youth Mr. B. learned carpentry from his father. He also worked at a lumber yard, and in the 1920s was sent for a time to a vocational school in Honolulu for training in cabinet work under an American teacher using Western tools, although according to Mr. B. the instruction was rudimentary. He returned to Maui and for the next 30 years worked for Alexander and Baldwin. In 1957 he moved his family to Honolulu to make it easier for his children to attend the University of Hawaii. He continued as a carpenter on house construction in Honolulu until his retirement.

Mr. C. was born in Ewa, Oahu in 1896. In 1898 his parents returned on a visit to Japan, where they left him with his grandparents. In 1914, when Mr. C. was eighteen years old, he rejoined his parents, who were living at Waialua on Oahu. Mr. C. then worked for Waialua Plantation, first in the cane fields and then in the mill, for twelve years. In 1926 he became a carpenter's apprentice in the Waialua Plantation mill carpentry shop under a Mr. Miyazaki, a master carpenter from Japan. At the time, the foreman of the shop was a Hawaiian; on his retirement, Mr. Miyazaki was appointed foreman. There were then four carpenters employed in the shop, and eight who worked on outside plantation jobs, including the building and repair of plantation houses. Mr. C. remained with Waialua Plantation and for many years was the head of both the shop and the outside carpentry work. When he retired, he had been with Waialua Plantation for 47 years.

Mr. D. was born in 1899 in Hiroshima Prefecture. In 1919 he came to Hawaii to join his grandparents in Hilo; they had immigrated nearly twenty years before. About 1922 Mr. D. became an apprentice at a local Japanese carpentry shop in Hilo. Thereafter, he married and worked for a number of contractors, the last for some thirty years. When there were no construction jobs, he made coffins for a Hilo mortuary. Although Mr. D. was occupied mainly in house construction, he also worked on larger jobs, including the Hilo Telephone Company's office building and the rebuilding of Volcano House after it burned in 1940. The Volcano House's *koa* bar was built by Mr. D. Through the years, he has made excellently crafted *koa* furniture for his family. In 1960 Mr. D. and his family moved to Honolulu, where he continued to work as an expert carpenter until his retirement.

Mr. E. was born in Hiroshima Prefecture in 1905. His grandfather was a shrine carpenter. Mr. E. came to Hawaii in 1924 at the age of nineteen. His father had previously immigrated in 1909 and was a small farmer, growing sugar cane on leased land on the island of Hawaii near Hilo. Mr. E. had worked at a lumber mill in Japan prior to joining his father, and soon after Mr. E. arrived he was employed at a mill cutting railroad ties of *ohi'a*. He also collected *koa* logs from upland areas, cut them, and shipped them to Honolulu, where there was a demand for *koa* for cabinet work and furniture. About 1925-1926 Mr. E. got a job as a fence-rider on Kukaiau Ranch on the slopes of Mauna Kea at the 7,000 foot elevation. This was a lonely job. In his spare time he salvaged fallen *koa* and made picture frames for sale in Hilo. He also sold some *koa* to the Hilo Boarding School and raised pigs to earn extra income. After his marriage in 1937, Mr. E. and his wife moved to Honolulu, where he was hired by Walker-Moody Construction Company as a carpenter's helper to a Mr. Izumi, who taught him carpentry. In 1945 Mr. E. decided to start his own business as an independent contractor. He was successful and continued as a contractor, mainly building houses, until his retirement.

Mr. F. was born in 1913 in Hiroshima Prefecture and about 1914 was taken by his parents to Korea, where he was reared. When he was sixteen years old, Mr. F. began his apprenticeship under a Japanese carpenter in Korea. In Korea he met a Japanese girl who was born on Maui, but who as a child had returned to Japan with her parents who had subsequently moved to Korea. He married the girl in 1941, and in 1945 after World War II they moved to Japan. His wife had relatives living in Hawaii and in 1959 he and his wife came to Oahu. He was in demand as an expert carpenter, specializing in cabinet work.

Mr. G. was born in 1913 in Kobe. In 1914 his parents brought him to the island of Hawaii, where they first settled. Later they moved to Wahiawa on Oahu, where his father was a farmer. In 1929 when Mr. G. was sixteen years old, he began his apprenticeship as a boat-building carpenter under a well known Japanese owner of a boat yard in the Kakaako district of Honolulu. This boat yard built fishing boats for the local tuna fleet. The master carpenters in the yard were all from Japan, mostly from Wakayama Prefecture. Mr. G. was an apprentice for four years, living in the owner's house. He was given his board and room and a little money when he visited his parents once a month but no regular wages. After finishing his apprenticeship, Mr. G. was employed as a carpenter in the boat yard operated by Hawaiian Tuna Packers. For a time he also operated his own yard. As the carpenters from Japan working in the yards retired, their places were taken by younger men they had trained.

Two final points that do not emerge from the above vignettes should be mentioned. In old Japan, the master carpenter was both carpenter and contractor, and at least in rural areas was architect as well. He combined both craft and entrepreneurial roles. In Hawaii these roles of carpenter and contractor became separated. Both before and after World War II, a trend developed whereby Japanese carpenters trained in Hawaii started their own business firms as general contractors usually engaged in house construction. If the firms were relatively small, the contractors also worked as supervising carpenters on their own jobs. Two of our informants began as carpenters and then became established contractors. There were many others.

The second point is that in Hawaii we are not aware of any Japanese carpenter's sons who in recent years have followed their father's

occupation. The sons of the carpenters of the generation with which we are here concerned have for the most part entered the professions, government civil service, or the corporate business field.

PRODUCTS OF THE CARPENTER'S CRAFT

There follows a highly abbreviated description of the products of the Japanese carpenter's craft in Hawaii, which is intended to be illustrative only. A thorough treatment is beyond the scope of this paper.

House-Building and Cabinet Work

During the first four decades of this century, the Hawaiian plantations were important as both employers of carpenters and as providing the training ground for a new generation of carpenters-to-be. The carpentry required by plantations was varied. Much of it was rough work, such as the construction and repair of wood flumes used for irrigation as well as for transporting cane from the fields to the mill. The senior author, Hisao Goto, started as a youthful apprentice flume carpenter on Puna Plantation on the island of Hawaii. Here two-man teams installed and repaired flumes made of 14 inch-wide redwood planks, transporting them by mule-driven wagons across often difficult terrain.

The plantations also entered into an extensive program of cottage construction to house plantation workers. According to Tyau,¹² Japanese plantation carpenters probably introduced at least two innovations into the building of these plantation houses. One was to construct the roof first and to elevate it on a skeleton frame, thereby providing shelter for the workmen beneath. The second innovation followed. This was the erection of single-thickness walls consisting of vertical 1 inch by 12 inch boards, strengthened by a girt, with exterior battens covering the seams, nailed to a sill, which in turn was elevated on posts set on concrete footers. The temporary studs holding up the roof were removed, which was then supported by the single-thickness walls. The walls later were usually of tongue-and-groove, introduced into Hawaii in the first decade of the century, but moving at different rates to the plantations. Hisao Goto remembers that at Puna tongue-and-groove was not used for workers' houses until about 1930 and that earlier houses were of rough lumber that even lacked battens.

The single-wall house was an ingenious response to the high cost of materials, virtually all of which were imported, and in due course it became extensively used in both urban and rural areas. It was also

economical of labor, the typical plantation house crew consisting of a head carpenter and four assistants. Tyau states that such a crew could build a 400-square-foot house in five days. He adds, "Born of economy of cost and material and a necessity for speed of erection, this house developed to become the most prevalent residential solution in Hawaii."¹³

The plantation house as just described obviously did not provide opportunities for fine carpentry. Except for the plantation manager's house, usually an imposing double-wall frame structure, it was mainly in the construction of urban residences and buildings that Japanese carpenters gained their reputation for expert craftsmanship.

One of the most distinctive characteristics of the best residential architecture in Hawaii lies in the integration of indoor and outdoor living, of interior and exterior spaces, which are unified rather than isolated, and in the close relationship between the architecture of the building with landscape architecture.¹⁴ The interiors of these residences are uncluttered, emphasize simplicity of line and surfaces, and the harmonious relationship of adjacent living areas, including the use of sliding doors to open space as well as to enclose it. In these residences, fine craftsmanship was demanded by exacting architects and discriminating clients, not confined to any one ethnic group. Japanese carpenters predominated in meeting this demand.

Oriental influence in Hawaiian residential architecture has been mostly a matter of decor. However, if the family is of Japanese ancestry and retains an attachment to its cultural heritage, a single room incorporating a household shrine may be constructed in Japanese style.

Cabinet work today is mainly prefabricated. As late as the 1950s, in many Hawaiian residences it was accomplished on the job site. The same was true of commercial buildings, churches, and museums. Figure 2 is an example of the work of the senior author.

Construction of Buddhist and Shinto Temples

At the end of the 19th Century, some of the major Buddhist denominations in Japan began sending missionaries to Hawaii. Their efforts were mostly directed to the plantations, which contained the majority of the Japanese population. In 1898 the Reverend Okabe is reported to have built the first Buddhist temple in the Hawaiian Islands, the Laupahoehoe Jodo Mission on the Hamakua coast of the island of Hawaii, then as now an important sugar-producing area.¹⁵ In the next decade and a half numerous small temples were established in plantation areas throughout the islands, and with the movement of Japanese to towns

such as Hilo and the city of Honolulu, Buddhist temples became part of the urban milieu.¹⁶ A similar pattern of introduction and establishment held for Shinto temples in Hawaii.

The earliest temple quarters were very simple and modest. It was not until Japanese congregations had accumulated sufficient hard-earned wealth that they could afford to build temples in Hawaii conforming to traditional Japanese architecture and methods of construction.

A technical point should here be introduced, namely, how is a frame building held together? The native Hawaiians, and indeed all Polynesians, accomplished it by lashing the structural members of the framework with sennit. The Polynesians elaborated lashing beyond that of any other Pacific people. The Japanese accomplished the same end through wood joinery and by using pegs and dowels. They utilized more than 400 different wood joints, incorporated in temples, shrines, and palaces, and in houses and furniture as well. The Japanese became world masters in wood joinery.¹⁷ The Western tradition, though certainly using numerous wood joints, nevertheless turned to the humble nail, as well as to metal screws and bolts. The unglamorous but economic Western tradition came to prevail in most wood construction in Hawaii. However, the temples and shrines in Hawaii reflected the Japanese master carpenter's skill in elaborate joinery, as well as in carving.

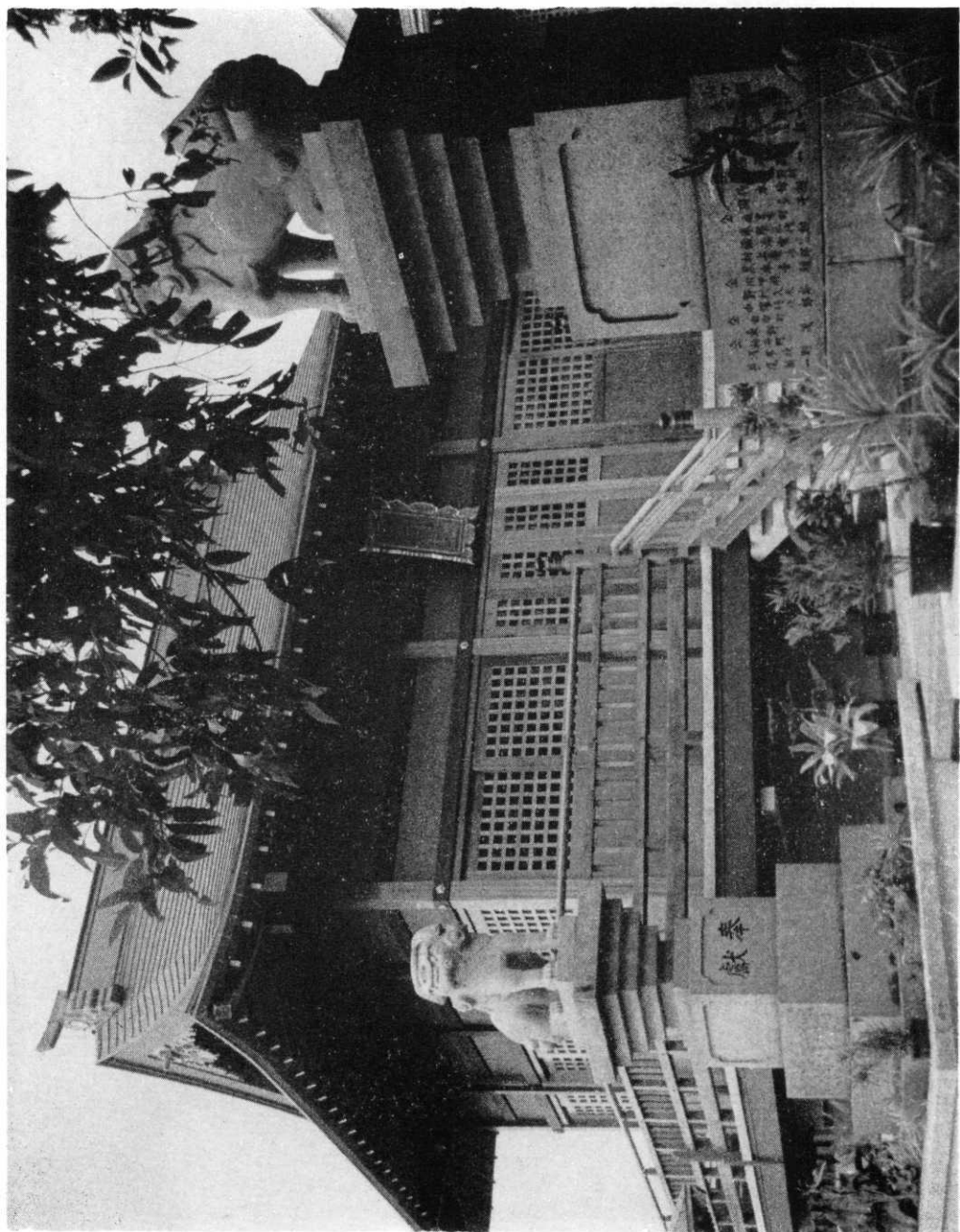
The master carpenters who built the temples and shrines in Hawaii in traditional Japanese form were generally brought from Japan for the purpose. An exception is Tetsuo Kubota, trained in Japan and the only shrine builder we know of who is a resident of Hawaii today and who supervised the construction of a new annex to the Kotohira Jinsha Shinto Temple in Honolulu in 1981, shown in Figure 3.

The Building of Fishing Boats

Japanese fishermen immigrating to Hawaii entered commercial fishing in Hawaii in the closing years of the last century. The 1896 census of Hawaii listed 90 Japanese fishermen. In 1899, Gorokichi Nakasuji from Wakayama Prefecture brought the first Japanese fishing sampan, 32 feet long and 5.8 feet wide to the Islands.¹⁸ In subsequent years, this style of fishing sampan was built by Japanese boat-builders, who followed the

FIG. 2. Exhibit alcove designed and constructed by Hisao Goto for Bishop Museum exhibition "Introducing Old Okinawa," 1956. The alcove incorporates fragments from the shrine of the Enkakuji Temple at Shuri, built in 1492. Photograph courtesy of Bishop Museum.





fishermen to Hawaii after the turn of the century. These sampans, a type of craft markedly different from any constructed in Hawaii previously, were small boats, powered by sail or sculled, and used principally for line and gill-net fishing. Cobb described them as follows:

Such a boat to be operated by two men is usually about 20 feet in length overall, with about 6 feet on the keel. The beam is usually about 4 feet 5 inches, while the depth averages 20 inches. The sampans are made of pine. Their most peculiar feature is an overhanging, partly enclosed stern, about 3 feet wide, in which the rudder is worked. The gunwale, from the bow for about two-thirds of the length on each side, overhangs nearly 12 inches, and there is a plank nearly 6 inches in height extending above it. In the bow is a large cubby-hole raised even with the top, in which fishing lines, sails, etc. are stored when not in use. In the center are about 8 compartments—4 on each side—12 to 15 inches deep, with plugs which can be pulled out in order to allow the entrance of water, thus making live wells. . . . Quite large sampans, with crews of from 4 to 6 men are employed in deep-sea fishing off Molokai.¹⁹

Until 1916 commercial fishing in Hawaii was conducted by a multitude of small-scale fishermen: Japanese, Hawaiian, other Pacific islanders, and Chinese, who provided fresh fish for the local markets. In that year F. W. MacFarlane started a small tuna cannery in Honolulu and through his stimulus two motorized sampans were built to supply the cannery. MacFarlane's cannery eventually became Hawaiian Tuna Packers, Ltd., and from these motorized craft there then developed the Japanese-style, diesel-powered tuna boat.²⁰ The Japanese fishing operators in Hawaii also became specialized to two types of tuna fishing: pole and line fishing for skipjack (*aku*) and long-line fishing for yellow fin and bigeye (*ahi*). They also engaged in net fishing for bigeye scad (*akule*).

The design of both *aku* and *ahi* boats was similar. This design underwent change and development in following years. Until the late 1930s, the boat's stem, keel, and transom were laid down first, a carvel bottom and sides then added, and only after were frames installed. According to Tokushige and Mitsue Nakahara, both boat-builders, Hawaiian Tuna Packers yard shifted to frame-first construction about 1938. Also, the first motorized boats had only an engine cover above deck. By the early 1930s a wheel house had been added, which then evolved into a flying bridge about the time of World War II.

Fishing and boat-building are specialized and separate occupations. The sampans in the motorized tuna fleet in Honolulu were built in the first instance by boat-builders from Japan. These men then trained their

FIG. 3. Annex to Kotohira Jinsha Temple, Honolulu, built under the direction of Tetsuo Kubota, 1981. Photograph by Kazuko Sinoto.

successors, also Japanese. The tuna cannery in Honolulu early established a yard for the building and repair of these fishing boats, employing Japanese craftsmen. Japanese boat-builders also operated private yards (there are five firms in our records) for the building and repair of tuna boats in the Kakaako district of Honolulu. Tuna boats were likewise built by Japanese boat-builders in Hilo. All these individual builders have long retired. The construction of wood-hulled tuna sampans of this type ceased in the 1950s, although a number are still in active use and are periodically overhauled in the yard still operated by Hawaiian Tuna Packers, Ltd. in Honolulu.

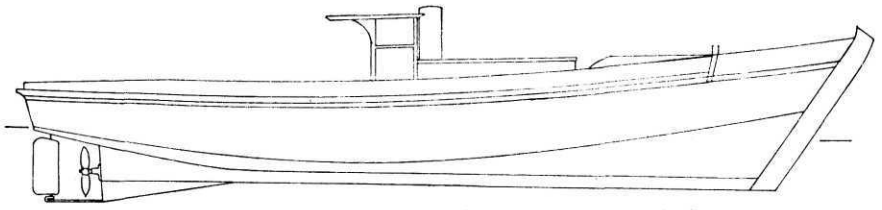
JAPANESE AND WESTERN HAND TOOL TRADITIONS

By a "tool tradition," we refer to an assemblage of tools used in a particular craft, the specific characteristics defining their form, the materials of which they are made, the purposes to which the tools are put, and the motor habits associated with their use, all persisting through time. In the present case we are concerned only with the hand tools of the carpenter's craft. Power tools are not included.

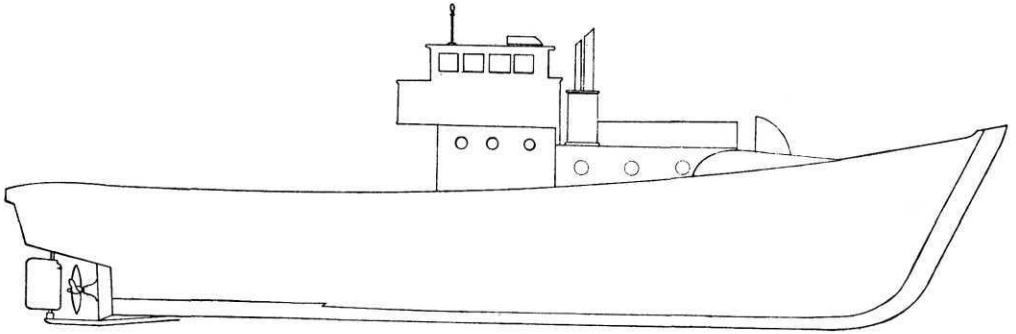
There is a close, interdependent relationship between the form of hand tools and the motor habits involved in their use. Tool form and motor habit are complimentary parts of a single cultural trait. Each reinforces the other. The tool forms and motor habits of different cultures around the world often show great stability and continuity, spanning generations and even centuries.²¹ This is true of both Japanese and Western tool traditions.

The tool traditions of Japan, and of the United States as representative of the Western tradition, also exhibit marked contrasts. This is especially apparent in the forms of saws and planes. It is equally apparent in the motor habits associated with their use. The Japanese pulls these tools toward himself; the American pushes them away from himself. The form of the tools reflect these contrasting motor habits.²²

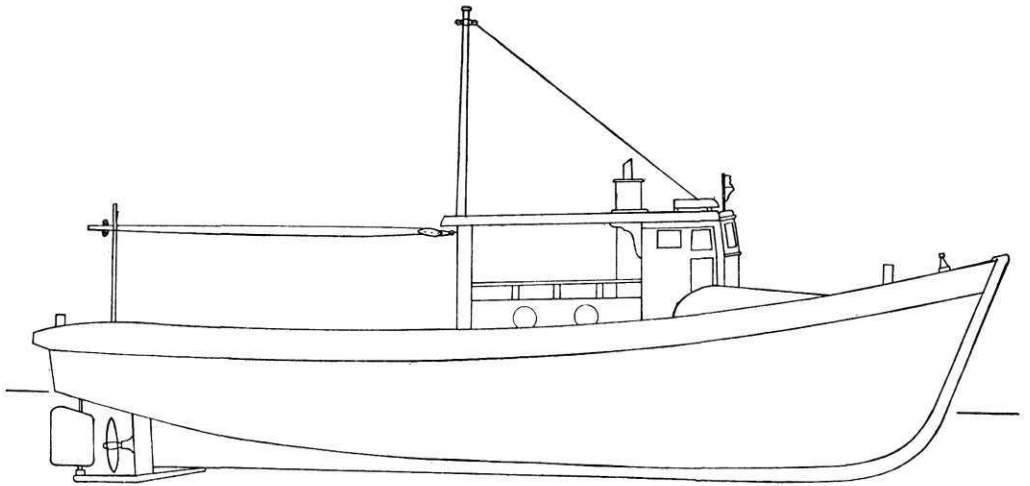
When the Japanese arrived in Hawaii, they found the Western carpenter's hand tool tradition long established. It seems probable that it was introduced by ship carpenters. However, the Japanese carpenters in Hawaii did not abandon their own Japanese tool tradition in favor of the Western tradition. The forces of persistence were such that they retained the essential core of their own carpenter's tool tradition. But they also adopted a series of Western tools as additions to their tool kits, thereby effectively merging two separate and distinct tool traditions.



A



B



C

FIG. 4. Outboard profiles of wood-hulled, commercial fishing boats built in Hawaii. (a) Tuna sampan, built 1935 by Hawaiian Tuna Packers, Ltd. Length 70 feet, powered by 120 hp diesel. Earlier motorized sampans lacked the deckhouse. (b) Tuna sampan with flying bridge, built 1950 by Hawaiian Tuna Packers, Ltd. Length 85 feet, powered by 330 hp diesel. (c) *Akule* boat, built 1946 by Hawaiian Tuna Packers, Ltd. Length 55 feet. Design of boat shows U. S. West Coast influence.

*Japanese Tools*²³

In Hawaii, with the exception of a few tools made by carpenters, commercially made tools were imported from Japan. Because their form may be unfamiliar to some readers, illustrative drawings are included.

Japanese cutting tools are made of a high-carbon, very hard steel, with cutting edges ground to an exceptional sharpness, which in the use of planes results in a very smooth finish. These tools also chip and break easily if they are not properly handled. The delicacy of many tools requires an equally delicate and precise set of motor habits in their use.²⁴

Saws (nokogiri). Saw blades are thin, with the shank of the blade set into a straight wood handle. The *ryoba-noko* is a double-edged saw with crosscut teeth on one edge and rip teeth on the other. The *azebiki-noko* is also double-edged and is particularly useful for cuts starting in the midsection of a board. In Hawaii the *azebiki* acquired a Hawaiian name, *manini* (a surgeon fish, *Acanthurus sandwicensis*), the only tool so honored. The *dozuki-noko* is a back saw for finish crosscuts; the same form of back saw with rip teeth is termed *hozohiki-noko*. The *mawashi-noko* is a keyhole saw. The *gando-noko* is a timber saw, whose teeth are a hybrid of crosscut and rip teeth. A special timber saw similar to the *gando* but with a much broader and larger blade was used by Japanese sampan builders in Hawaii but we have been unable to locate a surviving example. For sharpening saws, a very thin file (*yasuri*) is used; it comes in several sizes and is pushed rather than pulled.

Chisels (nomi). Chisels fall into two main types: those with an iron ring (*katsura*) around the striking end of the handle and used with a hammer (in Japan with a mallet); and those lacking the ring and pushed by hand. In Hawaii the first type is represented by hollow-ground butt chisels (*oire*) and mortise chisels (*mukoumachi-nomi*), and by gouges (*sotomaru-nomi*, *uchimaru-nomi*). The second type includes the slick (*usu-nomi*, *tsuki-nomi*) and the gooseneck (*kote-nomi*). Butt and mortise chisels come in a wide variety of blade widths, gouges less so. Chisel handles are usually of Japanese oak, but occasionally of boxwood or ebony. All chisels have a tang set into the handle.

Adze (chona). The Japanese adze used in Hawaii has a curved wood handle, set into the socket of the blade with a wedge. The edge of the blade is bevelled on both sides. A larger and heavier adze (*maejono*) was used in boat-building, but no example has been found. The adze was used for heavy work, such as squaring timbers.

Hammers (kanazuchi) and Mallets (kizuchi). The Japanese style hammer was found in the tool kit of only one carpenter, who was born in Japan and learned his craft under a Japanese master in Korea. The Japanese hammer was replaced in Hawaii by the Western claw-hammer. A similar case is the Japanese mallet. An illustration of the mallet is shown for the sake of interest, but no Japanese mallets were found in the tool kits of Japanese carpenters in Hawaii. It could have been used in the early years of the century, but it too was replaced by the claw-hammer.

Planes (kanna). Japanese carpenters in Hawaii used a wide range of Japanese planes. Plane bodies are predominantly of Japanese oak. In the accompanying illustrations all planes have a single blade. Two-bladed *kanna* are a more recent invention; the purpose of the second blade is to deflect shavings. Smoothing planes (*hira-ganna*) come in

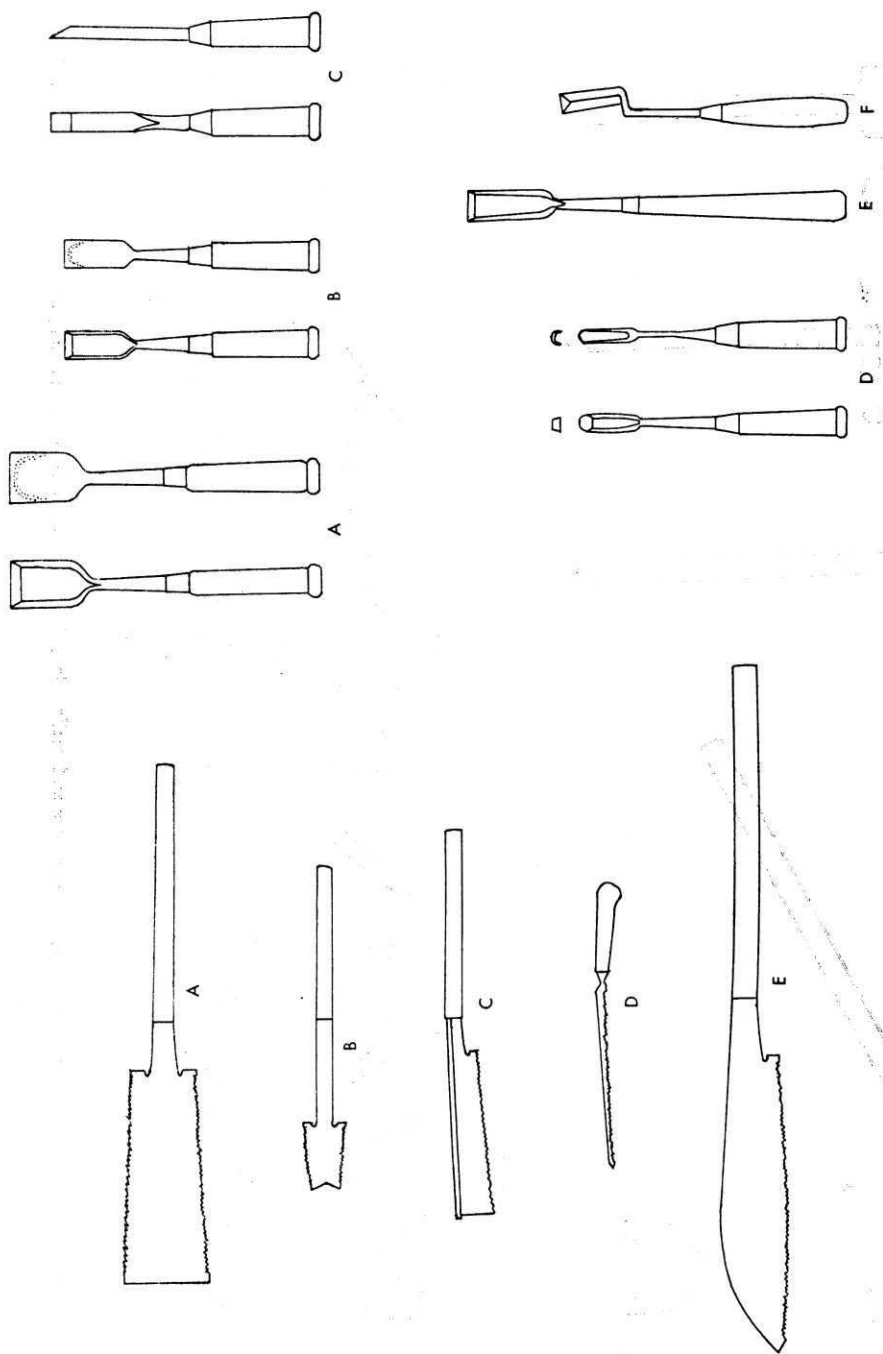


FIG. 5. Left: saws, all drawn to same scale. (a) *ryoba-noko*, length 52 cm. (b) *azebiki-noko*, length 29.5 cm. (c) *dozuki-noko*. (d) *mawashi-noko*. (e) *gandō-noko*. Right: chisels, all drawn to same scale. (a-b) butt chisels. (c) mortise chisel (d) gouges. (e) slick. (f) goose-neck, length 34.8 cm.

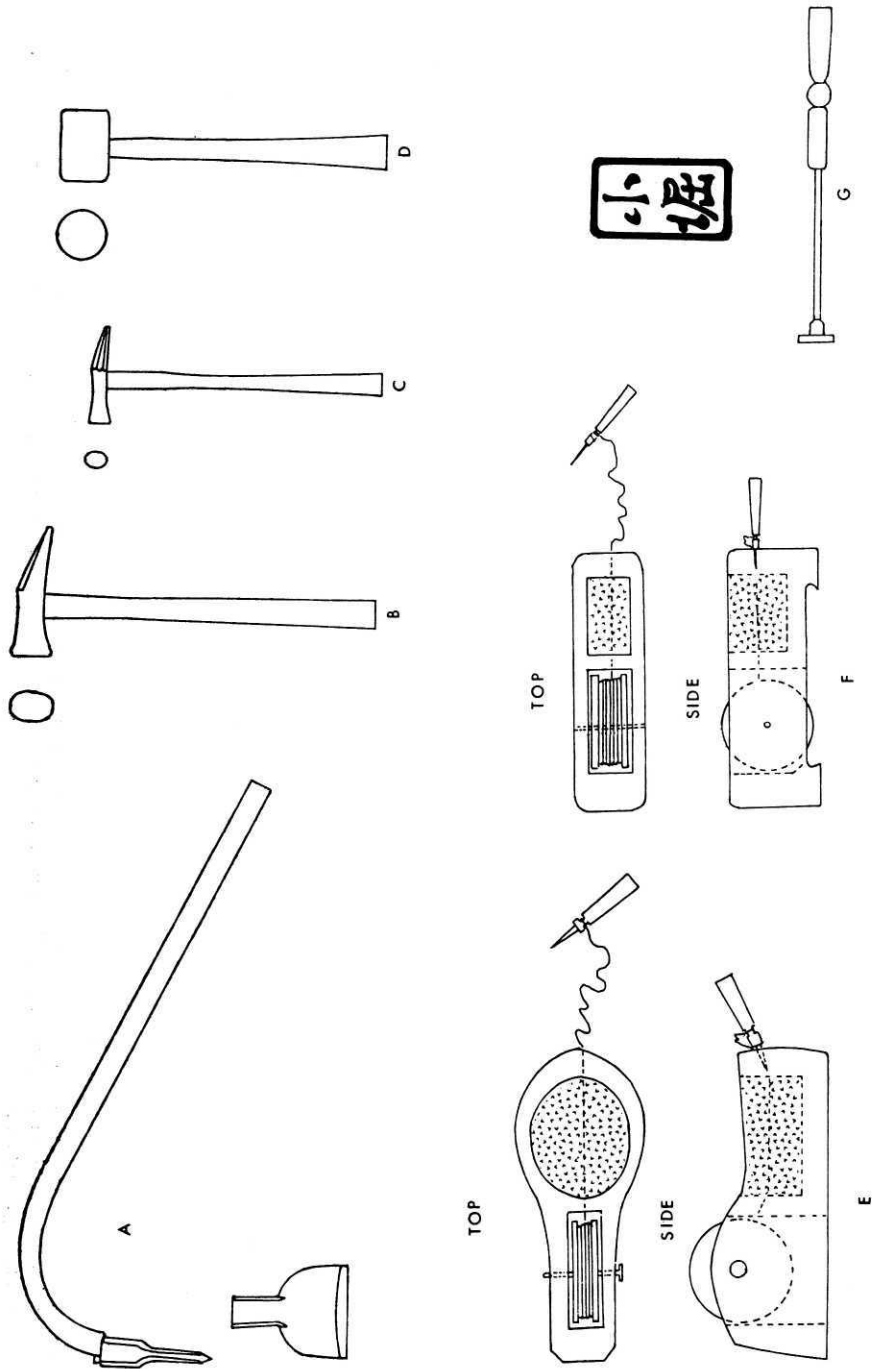


FIG. 6. (a) adze, length 53 cm. (b, c, d.) hammers and mallet; length of (c) 30 cm. (e, f) liners; length of (e) 15 cm. (g) branding iron.

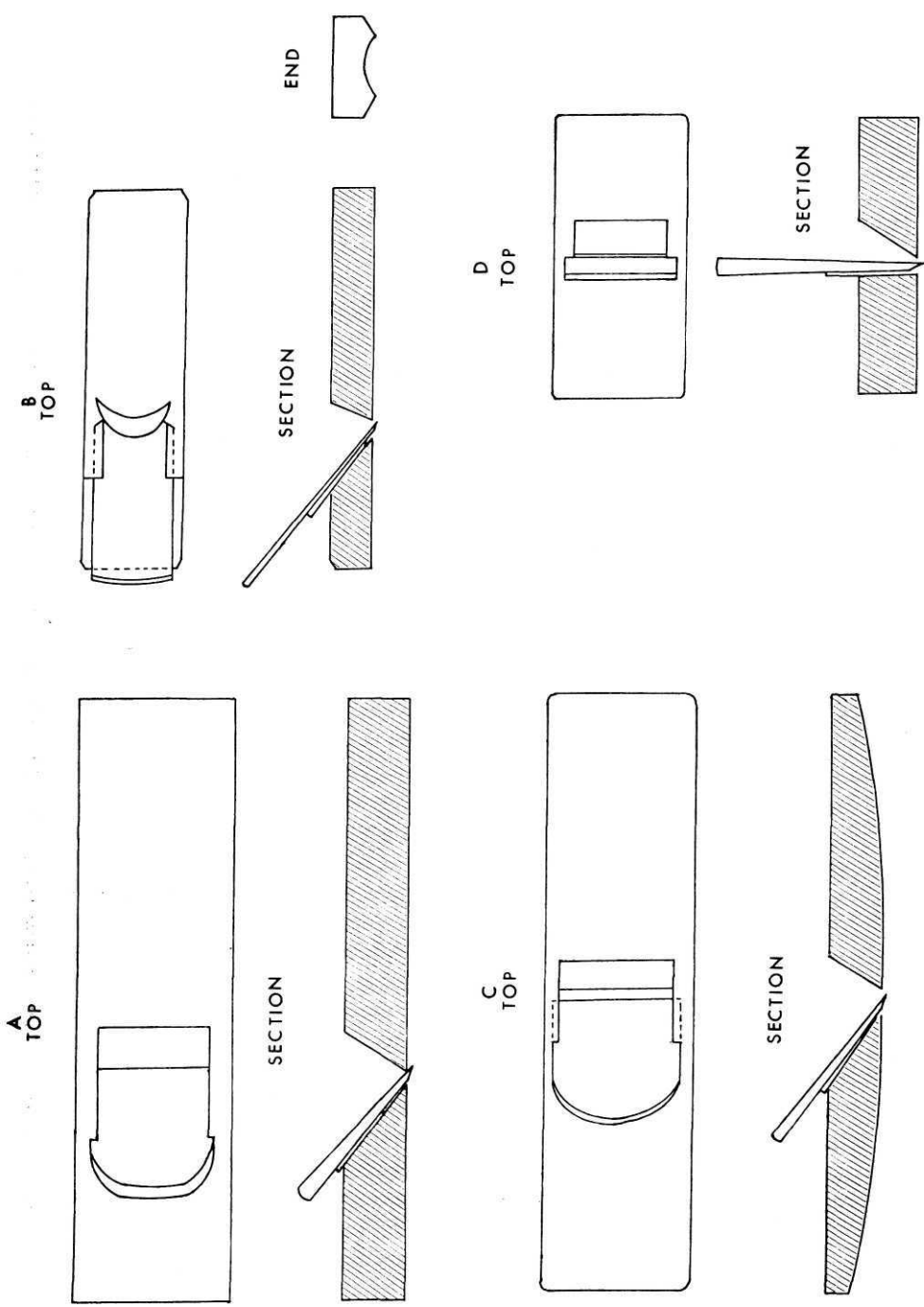


FIG. 7. Planes, all drawn to same scale. (a) smoothing plane, length 27.8 cm. (b) moulding plane. (c) compass plane. (d) correcting plane.

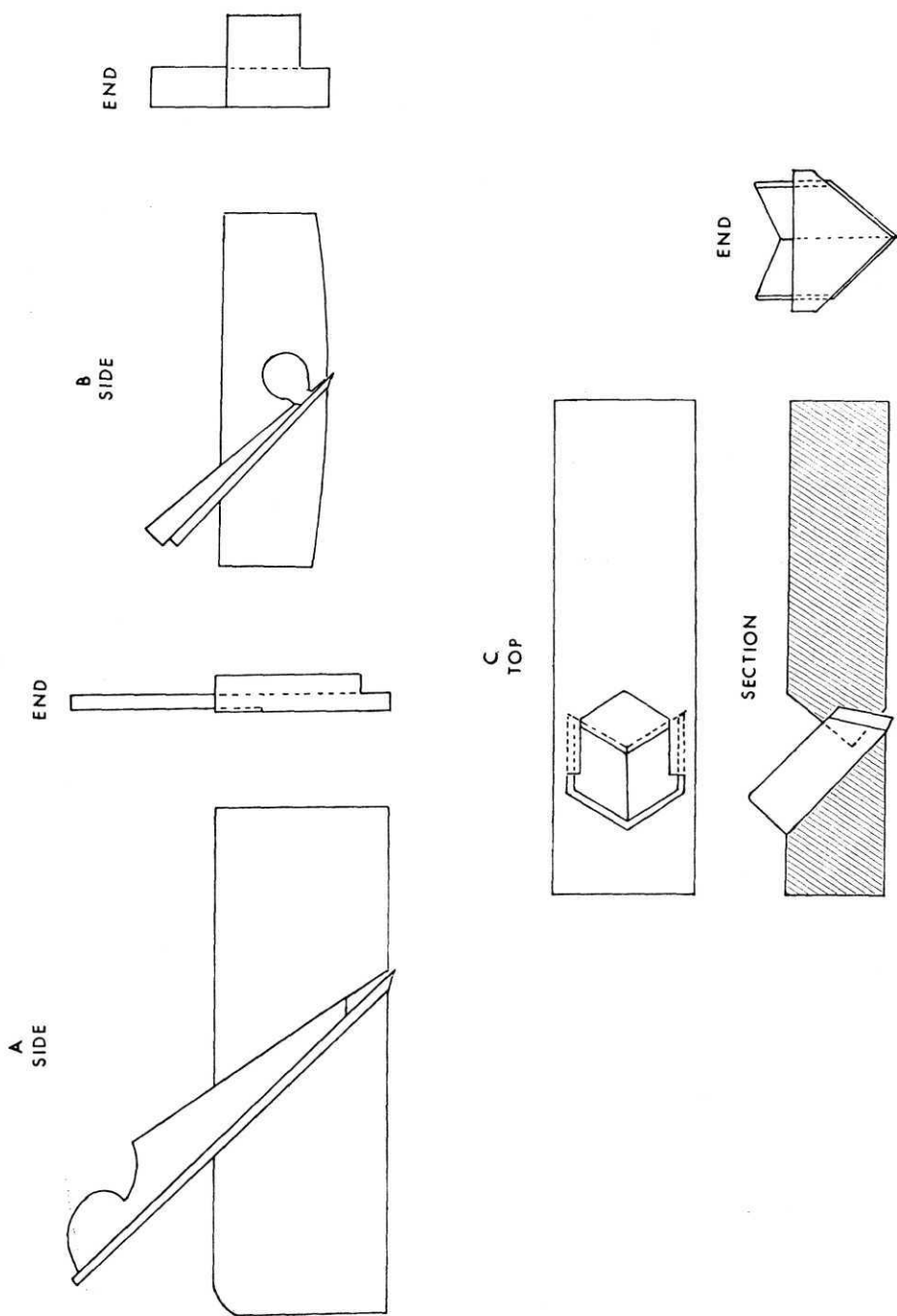
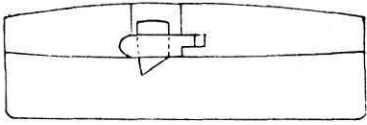
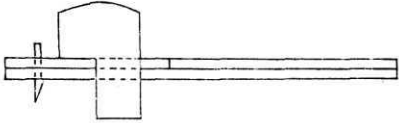


FIG. 8. Planes, all drawn to same scale. (a, b) rabbet planes, length of (a) 23.8 cm. (c) plane for grooving a right angle.

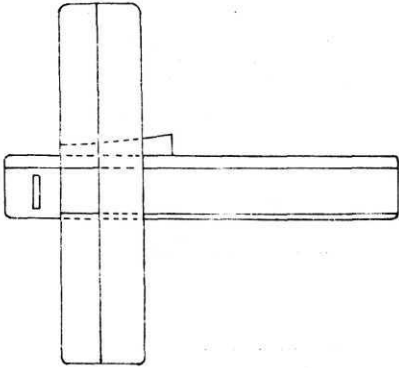
A
FRONT



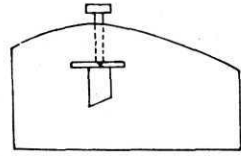
SIDE



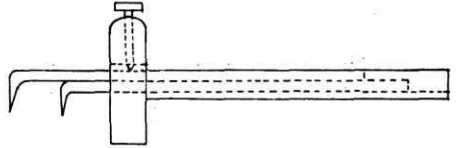
BOTTOM



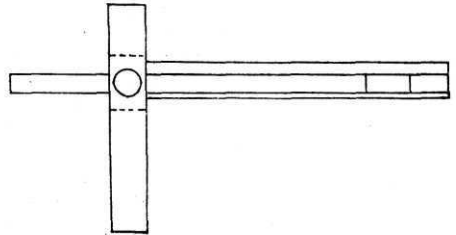
B
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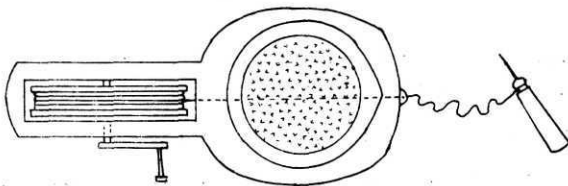
SIDE



TOP



C
TOP



SIDE

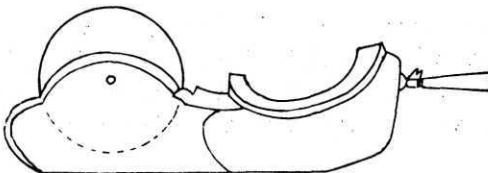


FIG. 9. (a) one-bladed marking gauge, length 17.4 cm. (b) two-bladed marking gauge. (c) liner. All drawn to same scale.

several blade widths, with the body proportional to the blade. Single-blade planes have a thin wedge inserted behind the blade. Small correcting planes (*dainaoshi-kanna*) with a vertical blade are used for smoothing the soles of other planes. Compass planes (*sori-ganna*) have different curvatures of the plane sole. Moulding planes (*maru-ganna*) are of different patterns, depending on the moulding design. A concave plane (*uchimaru-ganna*) is illustrated. Rabbet planes (*waki-ganna*) have the blade either on the left or the right side of the body, as the carpenter must plane in either direction with the grain of the wood. Shoulder rabbet planes (*mizo-ganna*) were also used. Adjustable planes include plough planes (*garasu-sakuri-ganna*), chamfer planes (*kaku-mentori-ganna*), and adjustable rabbet planes (*gyogitsuki-kanna*). Other special purpose planes include an interesting example used for grooving a right angle, through the use of a right angle blade.

Marking Gauges (kebiki). These come in several forms, of which two are illustrated. The one-bladed gauge is set with a wood wedge, the two-bladed form with a set screw inserted into the top of the handle.

Liner (sumitsubo). The *sumitsubo*, carved from a wood block, is the equivalent of the Western chalk line. The line is wound on a reel set into the body of the *sumitsubo*. From the reel the line passes through a black ink pad, made of silk floss in Japan but usually of shredded cotton cloth in Hawaii, in a cavity in the body and then through a small aperture in the cavity wall. A bamboo spatula is used to press the ink into the pad. The end of the line is secured to the pin; when the *sumitsubo* is not in use, the pin is plugged into the aperture. Two forms of *sumitsubo* used in Hawaii are illustrated. In the first form, the cavity for the ink pad is artistically enlarged; the second form is a simple rectangular block. In Japan the first form is characteristic of the Kanto region, the second form of the Kansai region. In the first form the sides of the body are often carved in a curvilinear pattern in low relief. We were told that in earlier years in Hawaii carpenters often carved their own *sumitsubo*, and that at the end of his training an apprentice might present a *sumitsubo* to his master carpenter as a gift of appreciation. In Japan an apprentice was sometimes assigned to make a *sumitsubo* to show his skill. Shrine builders made elaborate *sumitsubo* both for themselves and as offerings at shrines and temples. The *sumitsubo* is a distinctive art form among Japanese hand tools.

Branding Iron (yakigote). These were once used to mark tools with the owner's name, but they have passed out of use. Only one example exists in the Bishop Museum collection and none was observed in carpenter's tool kits, although the branding iron is well known and was used by some of our informants.

Whetstones (toishi). One of the time-consuming tasks of the apprentice in Hawaii was sharpening chisels and plane blades, using both man-made stones and very hard natural stones imported from Japan, which were preferred for completing the sharpening. In Japan, natural stones of various grades were used.

Other Tools. These include the try square, straight edge marked in *bu* and *sun*, gimlet, clamps, compass, calipers, files, knives, scissors, screw starter, and nail puller.

Western Tools

A list, probably incomplete, of Western tools commonly used by Japanese carpenters in Hawaii is given below. Like skilled craftsmen everywhere, they acquired tools of high quality. Except for Swedish chisels, popular among carpenters, the Western tools are American

made. Manufacturers include Stanley, Disston, Lufkin, Aikins, Bailey, Barton, Scioto, Sargent, and Union.

Saws. Crosscut saw and rip saw, used with the standard sawhorse. Back saw and miter box. Keyhole saw. Hacksaw for metal. Saw-tooth setter.

Chisels. Butt chisels, mortise chisels, gooseneck, slick, cold chisel.

Planes. Jack planes, jointer planes, rabbet planes, adjustable planes.

Other Tools. Claw-hammer. Spokeshave and drawknife. Level, try square, adjustable bevel, folding bench rule, steel tape in feet and inches, plumb bob, carpenter's pencil. Brace and auger bits, drill, punch. File and rasp. Clamps, pliers, carborundum sharpening stones, soldering iron, screwdriver, shingle cutter, and knife.

Tools Made in Hawaii

Japanese carpenters in Hawaii made some of their own tools. These included marking gauges (*kebiki*) and liners (*sumitsubo*), fabricated on the Japanese pattern. They also made special purpose planes, using American oak and maple for plane bodies and converting steel files and automobile springs to plane blades. Carpenters constructed their own wood tool chests. Unique items are a screwdriver converted to a chisel, a plumb bob converted to a punch, a file converted to a veneer knife, and a handmade soldering iron.

Local blacksmiths in Hawaii also contributed tools used by carpenters. The following were locally hand-forged: pliers, scissors, drills, punch, and a nail puller.

TOOL ADDITIONS, TOOL REPLACEMENT, AND TOOL RETENTION

In this study it proved impossible to examine the tool kits of Japanese carpenters as a series of total tool assemblages, and thereafter to analyze statistically these total assemblages in regard to the sequential adoption of Western tool types, the replacement of Japanese by Western tools, and Japanese tool type retention during a particular time span, such as the forty-year period between 1900 and 1940. The retired carpenters we interviewed had not kept in their possession many of the hand tools they had earlier owned, and the Bishop Museum collection, derived primarily from Japanese carpenters who are deceased, is incomplete. Only two complete tool kits, one being that of the senior author, were available for examination. Yet from the oral testimony of carpenter informants as to the tools they used, plus the tools available, it is possible to make the following observations:

1. Japanese hand tools were introduced into Hawaii by the Japanese themselves. The continued use of these tools in Hawaii was facilitated by their availability, as they were imported by hardware firms, operated mostly by Japanese store-owners, in response to demand. Both Japanese and Western tools were readily available.

2. Western tools were adopted on a selective basis by Japanese carpenters. The reason or basis for these adoptions was easily expressed by the carpenters we interviewed:

a. Pre-eminent among adoptions was the Western crosscut saw, the rip saw and the standard sawhorse, a single complex. This adoption was based primarily on the saving of time. Western saws are faster than their Japanese counterparts when fine, detailed work is not required. Carpenters in Hawaii were paid an hourly or daily wage; carpenters' compensation was time-oriented. Also adopted was the miter box, adapted to common cuts in Western carpentry.

b. The Western claw-hammer was universally adopted, based on the prevalence of nailing in American construction. The basis for this adoption was the compatibility of the tool with the prevailing technological system.

c. Similarly, the adoption of American-made try squares, bench rules, and steel tapes marked in feet and inches rather than in Japanese *bu* or *sun* or the metric system was a matter of compatibility with the prevailing system of linear measurement.

d. Long, Western jointer planes were more efficient and easier to use than Japanese planes for certain operations, such as smoothing wood floors. These planes were often handled by two men, one pulling, the other pushing.

e. The adoption of Western chisels was based on two factors. As they are made of softer steel than Japanese chisels, they take less time to sharpen; and if the operator strikes a nail, the chisel nicks or dents but does not break, as a Japanese chisel is apt to do.

3. With the adoption of Western tools, there was some tendency, as noted above, for them to replace their Japanese counterparts. The claw-hammer replaced the Japanese hammer and mallet. Western crosscut and rip saws replaced the Japanese *gando* saw and to some extent the *ryoba* saw, which continued to be used for fine work. In some degree Western chisels became preferred to Japanese chisels, although most carpenters used both. However, the core of the Japanese tool kit was retained. The basis for the retention was the differentiation between

rough work and fine work. In the former, such as framing a house and erecting the walls, Western tools were mainly used, thereby saving time. When construction shifted to fine work, such as installation of doors and windows, or cabinet work involving careful joinery, the carpenter shifted mainly to Japanese tools. Also, in contrast to rough work, fine work is necessarily more task-oriented than time-oriented. In this way the two tool traditions became combined according to a definite pattern, the distinction between rough work and fine work.

MOTOR HABITS AND THE MERGING OF JAPANESE AND WESTERN TOOL TRADITIONS

Most motor habits are learned rather early in an individual's life and once learned are considered to be very difficult for the individual to change. In discussing the significance of motor habits in the persistence of cultural patterns in technology and the arts, the anthropologist Kroeber wrote concerning the pulling versus pushing contrast between Japanese and Western tool use that

. . . once a certain skill has become established in connection with pushing, it is impossible for a given individual to be equally skillful when he substitutes the pulling motion. . . . The individual remains a lifelong addict to the particular set of habits that first became established in him. Just as he acquired these habits from older workmen, he is likely to transmit them to apprentices. . . .²⁵

In this context of contrasting motor habits, it should be pointed out that neither the Japanese nor Western tool traditions relies exclusively on either pushing or pulling actions by the operator. Japanese tools include the slick and gooseneck chisels, which are pushed, as is the file used to sharpen saws. Western tools include the drawknife and the adze, also found in the Japanese tool kit, which are either pulled as with the drawknife, or worked toward the operator as with the adze. The principal contrast between Japanese and Western tools lies with saws and planes.

The fact that neither the Japanese nor Western tool traditions rely exclusively on pushing or pulling may have facilitated the merging of these traditions by Japanese carpenters in Hawaii. Also, tools requiring opposing motor habits tended to be used in separate domains—those of rough work and fine work. Regardless of these distinctions, Japanese carpenters trained in Hawaii were equally proficient in the use of both Japanese and Western tools.

For Japanese carpenters who learned their craft in Japan and who then immigrated to Hawaii, our information on their adoption of Western tools consists mostly of what carpenters who trained under

them have told us. One elderly informant trained in Japan preferred Japanese tools, but he was for the most part engaged in fine cabinet work. He occasionally used Western hand saws for rough work, although in this case he relied principally on power tools. Other carpenters in this category seem to have adopted Western saws rather easily, despite the shift in motor habits. These are more malleable than Kroeber implied, especially when the individuals concerned possess a high degree of overall manual dexterity.

Japanese wood-working tools are today imported into the mainland United States and are obtainable by purchase,²⁶ although how proficient the buyers are in their use we do not know. There are no doubt individuals who have been able to combine Japanese and Western tool use in their work.

However, the Hawaii case is different. Here an entire, ethnically based craft merged two contrasting, sophisticated tool traditions to form a new composite set of manual practices. This is a noteworthy event in the history of hand tool technology. We know of no comparable instances and suggest the subject is one to which students of the history of tool technology can fruitfully give their attention.

NOTES

¹ The most famous standing wood structure in Japan is probably the five-story Horyuji pagoda at Nara, whose age is reputed to be about 1,300 years, the oldest wood building in the world. An authoritative source on the history of Japanese carpentry tools is Teijiuro Muramatsu, *Daikudōgu no Rekishi [History of Carpentry Tools]* (Tokyo: Iwanami-Shinso Series 867, Iwanami Shoten, 1978, first edition 1973). On the antiquity of the carpenter's craft in Japan, see also John F. Embree, *Suye Mura* (Chicago: University of Chicago Press, 1939), pp. 50, 240, 296; Louis Frédéric, *Daily Life in Japan at the Time of the Samurai, 1185-1603* (London: George Allen and Unwin, 1972; trans. by Eileen M. Lowe), pp. 42-43, 142-143. A classic account of 19th-Century Japanese houses and carpentry is Edward S. Morse, *Japanese Homes and Their Surroundings* (Rutland and Tokyo: Charles E. Tuttle Co., 1981, reprinting of 1886 edition).

² The authors gratefully acknowledge the generous assistance given by the following informants: Andrew Akiyama, Hayao Hatashima, Yaichi Ito, Masao Koike, Tetsuo Kubota, Ginichi Murakami, Mitsue Nakahara, Tokushige Nakahara, Charles Nuike, Tahei Takata, Frank Teruya, and Asao Toyofuku. For their aid we also thank Rev. Seiji Takai of Kotohira Jinsha Temple, Rev. Takamaro Saigusa of Wahiawa Hongwanji, and Katsukichi Kida. For assistance on source materials, we are indebted to Dr. L. Keith Brown, Department of Anthropology, University of Pittsburgh and to William Kikuchi, Department of Anthropology, Kauai Community College. Dr. Yoshihiko Sinoto, chairman, and Peter Gilpin, Eric Komori, and Aki Sinoto of the Department of Anthropology, Bishop Museum extended their full cooperation.

- ³ A concise review of Japanese immigration to Hawaii is given by Eleanor C. Nordyke, *The Peopling of Hawaii* (Honolulu: University Press of Hawaii for the East-West Center, 1977) pp. 35–39. Also see Romanzo Adams, *The Peoples of Hawaii* (Honolulu: Institute of Pacific Relations, 1925); Hilary Conroy, *The Japanese Frontier in Hawaii* (Berkeley: University of California Publications in History, vol. 46, 1953); Y. Scott Matsumoto, "Okinawa Migrants to Hawaii," *HJH* 16 (1982) 125–133; James H. Okahata (ed.), *A History of the Japanese in Hawaii* (Honolulu: United Japanese Society of Hawaii, 1971); Robert C. Schmidt, *Historical Statistics of Hawaii* (Honolulu: University Press of Hawaii, 1977); Ernest K. Wakukawa, *A History of the Japanese People in Hawaii* (Honolulu: The Toyo Shoin, 1938).
- ⁴ Nordyke, *Peopling of Hawaii*, Table 3.
- ⁵ U. S. Census, 1920.
- ⁶ U. S. Census, 1940.
- ⁷ In Table I the category *Others* includes Caucasian, Black, Filipino, Korean, Portuguese, and Puerto Rican as census categories. The figures probably include carpenter's helpers.
- ⁸ Source: *Report of the Commissioner of Labor for Hawaii* (Washington: Govt. Printing Office, 1900, 1910, 1915). The 1900 figures are based on 38 plantations and probably include carpenter's helpers. 1910 figures are based on 52 plantations and include 458 carpenter's helpers, of which 404 were Japanese. 1915 figures are based on 50 plantations and include 462 carpenter's helpers, of which 384 were Japanese.
- ⁹ R. P. Dore, *Education in Tokugawa Japan* (Berkeley: Univ. of California Press, 1965), pp. 266–270; Louis Frédéric, *Daily Life in Japan*, pp. 42–43; John W. Hall and Richard K. Beardsley, *Twelve Doors to Japan* (New York: McGraw Hill, 1965), pp. 394–395; Lafcadio Hearn, *Japan, An Attempt at Interpretation* (New York: Macmillan, 1905), pp. 443–445; Johannes Hirschmeier and Tsunehiko Yui, *The Development of Japanese Business, 1600–1973* (Cambridge: Harvard Univ. Press, 1975), pp. 38–39, 59, 167–168; Mock Joya, *Mock Joya's Things Japanese* (Tokyo: Tokyo News Service, 1964), pp. 681–685; Odahashi Sadaju, "Totei Seido ni Tsuite" [On the Apprentice System], *Journal of Labor Problems* 9 (1947) 15–32; Charles D. Sheldon, *The Rise of the Merchant Class in Tokugawa Japan, 1600–1868* (Locust Valley: Monographs of the Association for Asian Studies, V, 1950), pp. 52–55, 66, 90–91; *Tōhoku no Kushō [Master Artisans of Tohoku]* (Tokyo: Mainichi Shimbun, 1980).
- ¹⁰ Akinori Ogimura, "Shokugyō to Kindai Shakai" [Professions in Modern Society] *Shakaigaku Hyoron* 5 (1955) 94–98; Mary J. Kleinberg, *Kinship and Economic Growth in a Japanese Village* (Ann Arbor: University Microfilms, 1979), pp. 315–326.
- ¹¹ An interesting example is the series of articles by Ben Asakura on the recollections of Kauai's Masachida Yotsuda, variously plantation laborer, independent farmer, stevedore, carpenter, tugboat pilot, and boat-builder, in *The Garden Island*, 2, 5, 7, 12, and 14 January, 1981.
- ¹² Gordon Tyau, "Form and Origin of the Plantation House," *Historic Hawai'i News* 8 (March, 1982) 6–7.
- ¹³ *Ibid.*, p. 7.
- ¹⁴ Harry W. Seckel, *Hawaiian Residential Architecture* (Honolulu: Bishop Museum Press, 1954).
- ¹⁵ *Brief History of Buddhist Temples* (Hilo: Big Island Buddhist Federation, 1979), p. 2.
- ¹⁶ *Ibid.*; Y. Imamura, *History of the Hongwanji Mission in Hawaii* [English and Japanese] (Honolulu: Publishing Bureau of the Hongwanji Mission, 1918).
- ¹⁷ Ty and Kiyoko Heineken, *Tansu: Traditional Japanese Cabinetry* (New York: Weatherhill, 1981); Kiyoshi Seike, *The Art of Japanese Joinery* (New York: Weatherhill/Tankosha, 1981).

- ¹⁸ Okahata (ed.) *History of Japanese Immigrants in Hawaii*, p. 208.
- ¹⁹ John N. Cobb, "Commercial Fisheries of the Hawaiian Islands in 1903," *U. S. Bureau of Fisheries Report for 1904* (Washington: Govt. Printing Office, 1904), p. 720.
- ²⁰ *Tuna: Hawaii's Harvest of the Sea* (Honolulu: Hawaiian Tuna Packers, Ltd., n.d.), pp. 3-4.
- ²¹ Alfred Kroeber, *Anthropology* (New York: Harcourt Brace and Co., 1948), p. 348; George I. Quimby and Alexander Spoehr, "Acculturation and Material Culture," *Fieldiana: Anthropology*, 36, no. 6 (1951), 107-145.
- ²² On Japanese carpentry tools and their use, see Yoshio Akioka, *Nihon no Tedōgu* [*Japanese Hand Tools*] (Osaka: Sogensha, 1980, first edit. 1977); Yoshio Akioka and Makoto Yoshimi (eds.) *Mokkogu Shiyōhō* [*How to Use Wood-Crafting Tools*] (Osaka: Sogensha, 1982; first ed. 1980); Muramatsu, *History of Carpentry Tools*, 1978; Kip Mesirow and Ron Herman, *The Care and Use of Japanese Woodworking Tools* (Woburn, Massachusetts: Woodcraft Supply Corp., 1978). An interesting Japanese carpenter's manual is Hanjiro Inoue, *Kenchikushi Yorān* [*Carpenter's Manual*] (Tokyo: Hakubundo, 1910). On Western tools, see R. A. Salaman, *Dictionary of Tools* (London: George Allen and Unwin, 1975); Stanley Schuler, *The Illustrated Encyclopedia of Carpentry and Woodworking Tools, Terms, and Materials* (New York: Random House, Pequot Press, 1973).
- ²³ Japanese boat-builders used a number of specialized tools, such as caulking chisels, which are not described in this section. The tools described were used in the construction of buildings and in cabinet work. The description is based on the tool collection of the Bishop Museum and on the tools in the possession of the senior author and of the informants interviewed.
- ²⁴ Mesirow and Herman, *Care and Use of Japanese Woodworking Tools*, pp. 3, 5.
- ²⁵ Kroeber, *Anthropology*, p. 348.
- ²⁶ Woodcraft Supply Corporation, Woburn, Massachusetts has long imported Japanese woodworking tools.