A History of the Binomial Classification of the Polynesian Native Dog

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THIS IS A SURVEY of attempts from the last quarter of the eighteenth century to the present to give a binomial classification to the Polynesian native dog. Taxonomic interest has been expressed mainly by German and British natural scientists. Most of them, having neither seen a living Polynesian dog of unquestioned native breed nor studied skeletal material from a dog presumed to be of native breed, have had to depend on a few generalized descriptions by explorers and settlers. Presented here are the taxonomists' classifications and theories, the descriptions that they have cited, and the probable sources and dependability of any of their unacknowledged information about the appearance of the Polynesian native dog.

This paper results from my interest, mostly anthropological and mythological, in the Polynesian native dog. Polynesians in New Zealand, the Tuamotus, and the Hawaiian Islands narrate variants of a myth that the demigod Maui-of-a-thousand-tricks transformed a man he hated into a dog, the first known to them and a symbol of abhorred traits like gluttony, laziness, and incest. A story, entirely different from this, that Samoans and Tongans tell, of how Maui died when he attempted to kill a cave-dwelling, man-eating dog, is probably a post-European composition since the dog was apparently absent from western Polynesia at the time of European discovery (Luomala, 1958). Polynesians had ambivalent attitudes toward the dog, for it was both a symbol of the social outcast and a symbol of prestige that through its varied uses increased the status of its owner (Luomala, 1960).

The dog was present at the time of European discovery of Polynesia in only a few archipelagoes. The Tuamotus, Society Islands, Hawaiian Islands, and New Zealand had dogs which I believe they did not get from any *known* European explorers and which may actually have been descendants of dogs introduced into the eastern Pacific by the Pacific islanders themselves. No dependable evidence has been found of the dog's presence in western Polynesia at the time of first European contact. Indicative of the intricacies of the question of the pre-European distribution of the dog is the fact that the first European reference to seeing a dog in Polynesia was in 1606 at a Tuamotuan atoll, perhaps Anaa, where the Quiros expedition met an old lady carrying a little white or speckled dog and wearing a gold and emerald ring! Also in certain other islands like Tonga, for example, no dogs existed but the natives recognized and called by the name of *kuri,* the most common Polynesian word for dog, the dogs on board Captain James Cook's ships (Luomala, 1960).

Only studies of skeletal remains of dogs from archeological sites definitely established as pre-European by radiocarbon dating or other means will provide more information than we now have on the native dog. Only in the Hawaiian Islands, New Zealand, and the Marquesas is such work going on at present. The Marquesans apparently had no live dogs at the time of European discovery in 1595, but recent finds in 1956 of remains of dogs in what appear to be pre-European sites on the western coast of Nukuhiva Island point to their former presence in the Marquesas (Shapiro, 1958: 269).

I have never located any information as to what finally happened to the Tahitian dog that George Forster of Cook's second expedition mentions was brought back to England. There is no further word on its fate in England or what disposition of its hide and skeleton was eventually made when it died. It was one of two of the Society Islands dogs aboard ship that had recovered from an experiment on them at "Mallicollo" (Malekula, New Hebrides) with Malekulan arrow poison. Later the dogs, like some other domestic animals and a pet bird aboard

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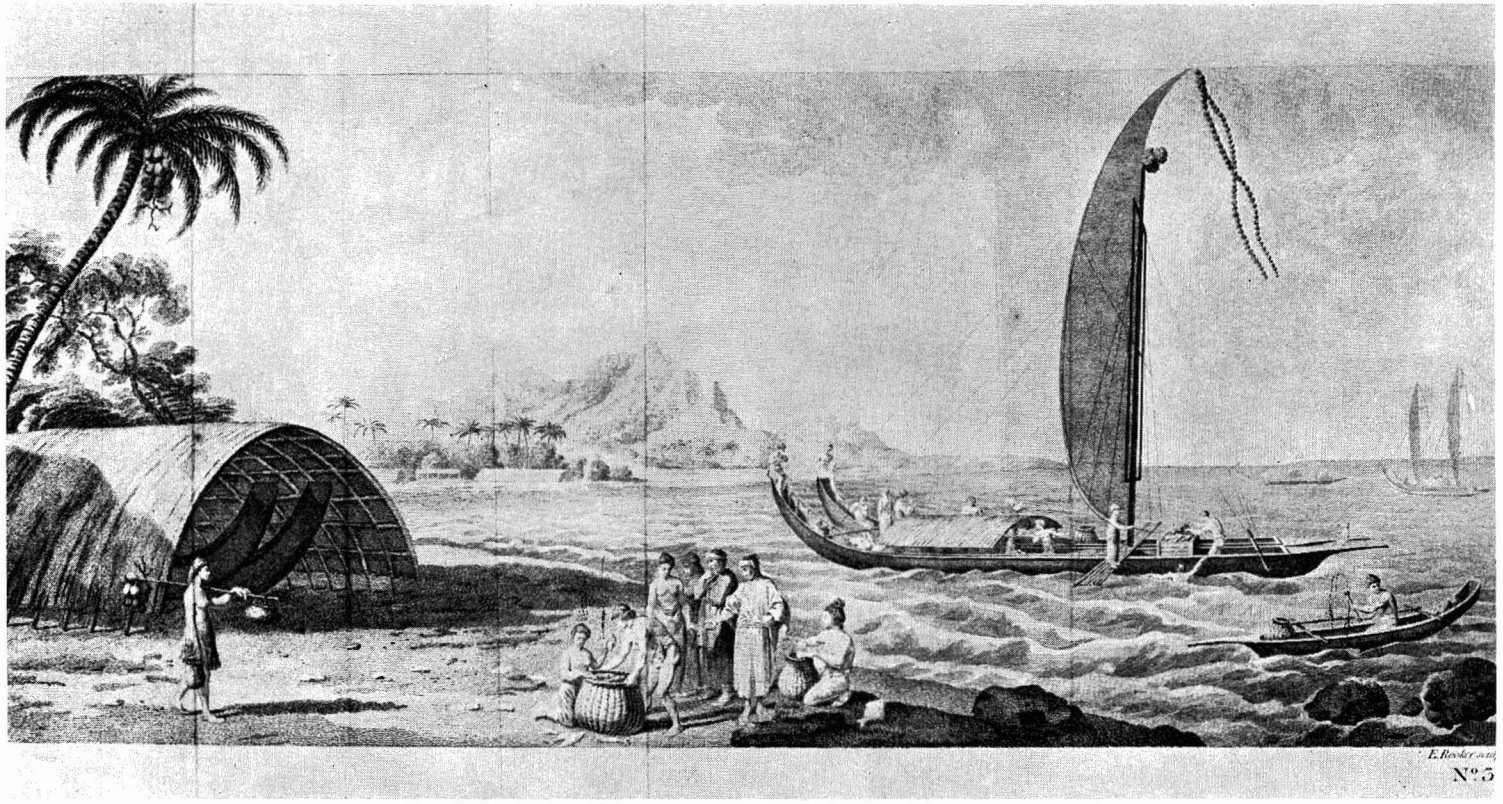

FIG. 1. "A view in the island of Ulietea with double canoe and a boat house" (Hawkesworth, 1773, II : pl. 3). Raiatea, Society Islands, on Captain Cook's first voyage. The dog is aft on the large double canoe. The head of a horned cow is visible forward.

and some of the crew, suffered agonies from eating poisonous fish. Of the dogs George Forster writes (1777, II: 244), "One of these poor creatures was doomed to be a martyr, being the same upon which we tried the Mallicollese arrows; however he luckily got the better of both these attacks, and was brought to England."

ILLUSTRATIONS

Artists of the eighteenth and nineteenth centuries have depicted island dogs. The drawings from the nineteenth century, however, usually show dogs that are obviously European or mixed European and native. Even in the earlier drawings one must consider the possibility that a pet of foreign origin from the European ships has got into the scene. Most often the artists show the dogs in canoes, like family pets determined to go for a ride.

Two illustrations by Sydney Parkinson, artist on Cook's first expedition, show dogs in canoes in the Society Islands. One (Hawkesworth, 1773, II: pl. 3) is "A view in the island of Ulietea with double canoe and a boathouse," and shows a dog sitting in a canoe at Ulietea (Raiatea) which is also transporting a horned cow from the European ship. Another sketch (Hawkesworth, 1773, II: pl. 4) is "A view of the island of Otaheite with several vessels of that island"; and shows a dog sitting contentedly by a youth with a long-poled net.

Two unidentified photostats at Bishop Museum of sketches of canoe scenes in the Society Islands, obviously of the eighteenth century, and done by British artists, to judge from the titles, do not appear in any published collections of illustrations that accompany the voyages. Dogs appear in the scenes. One scene, with the title "Double Canoes. Tipaerua," probably written in by the artist, clearly shows a dog in one of the canoes. The other scene with the title "Canoe of Ulietea," also written in by the artist, shows a child on the deck of a double canoe clasping a dog with a very pointed muzzle. The original drawings, I later learned, are at the British Museum, from which I then obtained fine photographs of the two drawings and of the particular sections showing the dogs. The Keeper of the Department of Manuscripts states "that the information given by the catalogue of additions is as follows: 'A collection of drawings by A. Buchan, S. Parkinson and J. F. Miller, made in the countries visited by Captain Cook in his first voyage (1768–71), also of prints published in John Hawksworth's Voyages of Biron, Wallis and Cook, 1773, as well as in Cook's second and third voyages (1762–5, 1776–80).'" Since to my knowledge the drawings do not appear in any of the published accounts, I am inclined to believe that they were made by one of the three artists named above in the countries visited by Cook on his first voyage in 1768–1771. In other words, they probably belong to the same series as the two named above which Hawkesworth used in writing up the account of Cook's first voyage.

Published plates by John Webber, artist on Cook's third expedition, also depict dogs. One scene (Cook, 1784: Atlas, pl. 14) of "The reception of Captain Cook in Hapaee," Hapai, Tonga, shows a lean dog at the lower right of the picture. Another scene (Cook, 1784: Atlas, pl. 31) is "A view of Huaheine," Society Islands, and shows a man kneeling on the deck of a double canoe near the boathouse and perhaps holding still the dog in front of him so that the artist can sketch it.

Louis Choris (1822), in a drawing owned by the Honolulu Academy of Arts and previously unpublished (Bishop Museum Negative 20599), shows a Hawaiian scene with two dogs in the foreground. The larger dog because of its size and flopping ears does not fit the customary description of the native dog; the smaller dog

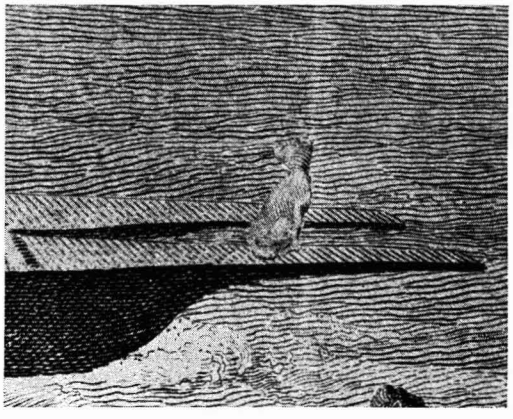

FIG. 2. Detail of dog shown in double canoe in Figure 1 at Raiatea, Society Islands.

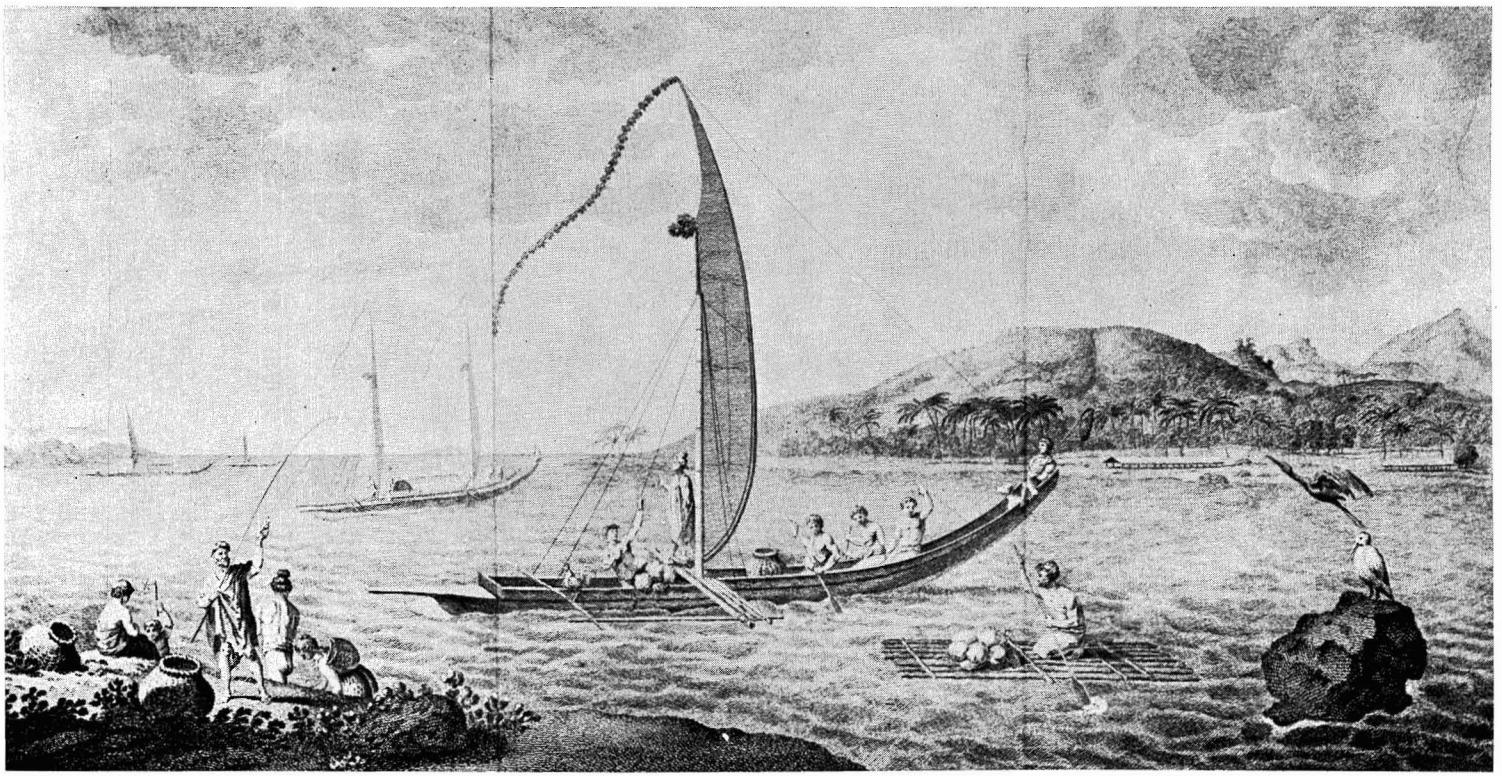

FIG. 3. "A view of the island of Otaheite with several vessels of that island" (Hawkesworth, 1773, II : pl. 4). Tahiti, Society Islands, during Captain Cook's first voyage. The dog is sitting below the boy in the prow. As usual, a seagoing rooster is also in the picture.

is nearer the type. Vaillant (Album, No. 45; Bishop Museum Negative 20588) in "Vue de Honolulu. Iles Sandwich" done in the mid-1830's shows a dog with a Hawaiian couple. Dogs depicted by artists in later volumes look increasingly like European breeds.

The Dominion Museum, Wellington, New Zealand, has kindly sent a photograph of a specimen (B. 3527) often described, though questionably, as of the pre-European breed of dog. Dr. T. Barrow writes to me from the Museum that ". . . the history of the specimen is inadequate, and the ancestry of the dog doubtful. . . . It was collected at Waikawa, but there are several Waikawas in New Zealand, and we are not sure which place is referred to. The collector was Anderson. We may take it that it is not one of the two dogs caught during the time of Sir George Grey's office in this country."

Sir George Grey, former Governor-General of New Zealand, sent to the British Museum in the last half of the nineteenth century (Hector, 1876: 244) the hide and skeleton of one of two dogs thought to be of the native breed. Among the long-time residents of New Zealand who interested themselves in what the native breed had looked like and whether any traces remained, W. Colenso (1877), who had thoroughly criss-crossed North Island between 1834 and 1854, declared that he had never seen a true Maori dog and considered these later dogs, such as the one Sir George sent to the Museum, to be wild dogs not of the native breed. A large problem not taken up in my study is the evaluation of an extensive literature, mostly from New Zealand, describing and discussing nineteenth-century specimens that are regarded by some writers as belonging to the pre-European native breed or breeds. The stuffed specimen at the Dominion Museum was often figured in Elsdon Best's (1924, I: 433) writing as a native breed.

George Forster compared the New Zealand native dog with the shepherd's cur depicted by Buffon (1755, V: pl. 28), and H. G. L. Reichenbach (1836: 46, pl. 72) sketches a most imaginative reconstruction of the appearance of *Canis tahitiensis*.

A Papuan with his dog hunting wild pigs that swim near the canoe was sketched in the last quarter of the eighteenth century (Forrest, 1779: 59, pl. 11).

What seems to be the first depiction of the Australian native dog, the dingo, appeared in 1789 (Phillip, 1789: pl. 45, facing p. 274) with the publication of a sketch of a female from New South Wales, which Governor Phillip had sent to England as a present that eventually came into the possession of the Marchioness of Salisbury at Hattfield House. Another specimen in England was owned by Mr. Lascelles. The London zoo also had some. A description is given in a later section of my paper because of the frequent references to post-European mixtures of the dingo and the native dog of New Zealand.

Among Hawaiian petroglyphs are representations of dogs. Figure 22 shows a section of petroglyphs in Nuuanu Valley, Honolulu.

FOUR PRIMARY EIGHTEENTH-CENTURY SOURCES

Scientists interested in classifying Polynesian native dogs cite most often three or four of the several statements about dogs made by J. R. Forster and his son George, natural scientists who accompanied Cook on his second voyage to the Pacific from 1772 to 1775. The Forsters' accounts, together with those of the New Zealand dog by Crozet in 1772 and of the Hawaiian dog in 1779 by Lieutenant James King (later Captain King), are the first extensive, but not the first, references to the dog in the literature

FIG. 4. Detail of dog in Figure 3. The long muzzle is clearly evident. The ears seem to be flopped forward.

about Polynesia. Both Crozet's and King's accounts are largely overlooked by taxonomists. None of the four primary describers attempts any classification.

Superficial and incomplete as the four descriptions are, they are the best available because they definitely are about the native dog. Later descriptions must always be suspect because during the last quarter of the eighteenth century the native dog increasingly lost its identity through cross-breeding with dogs which European ships had picked up in ports around the world and taken to the islands. The Forsters and others had pet dogs, some of European or other foreign breeds, others of native breeds, and still others of mixed native and foreign origin. Captain Cook bought many native dogs either to be eaten on his ships or to be given as gifts to Polynesian and Melanesian chiefs who had no dogs (Luomala, 1960).

The generalized description of the native dog by J. R. Forster (1778: 189) which is most often cited or paraphrased by classifiers follows:

> The dogs of the South Sea isles are of a singular race: they most resemble the common cur, but have a prodigious large head, remarkably little eyes, prick-ears, long hair and a short bushy tail. They are chiefly fed with fruit at the Society Isles; but in the low isles and New Zealand, where they are the only domestic animals, they live upon fish. They are exceedingly stupid, and seldom or never bark, only howl now and then; have the sense of smelling in a very low degree, and are lazy beyond measure: they are kept by the natives chiefly for the sake of their flesh, of which they are very fond, preferring it to pork; they also make use of their hair, in various ornaments, especially to fringe their breast plates in the Society Isles, and to face or even line the whole garment at New Zealand. . . .

Taxonomists also often cite two of George Forster's descriptions, one of the New Zealand dog and the other about that in the Society Islands. These zoologists, most of them German, quote from the German translation of Forster's journal, which first appeared in English. The reference in the German edition (1778, I: 165) differs from the English edition (1777, I: 377) only in omitting a reference to the texture of the dog's hair being rough.

According to George Forster, in June, 1773, some of the New Zealand Maoris visiting Cook's ship had dogs in their canoes:

> A good many dogs were observed in their canoes, which they seemed very fond of, and kept tied with a string, round their middle; they were of a rough long-haired sort, with pricked ears, and much resembled the common shepherd's cur, or count Buffon's *chien de berger* (see his Hist. Nat.). They were of different colours, some spotted, some quite black, and others perfectly white. The food which these dogs receive is fish, or the same as their masters live on, who afterwards eat their flesh, and employ the fur in various ornaments and dresses. They sold us several of these animals, among which the old ones coming into our possession became extremely sulky, and refused to take any sustenance, but some young ones soon accustomed themselves to our provisions.

The various editions of Buffon's work use different illustrations of the sphepherd's cur but the sketch (see Fig. 17) in the first edition (1755, V: pl. 28, following p. 300) is probably the one known to Forster. It is usually difficult to know what variety of dog a writer has in mind when he likens the Polynesian dog to a shepherd's cur, barbet, pomeranian, turnspit, poodle, dachshund, terrier, fox-dog, or Asiatic pariah dog. These popular terms tend to be differently used at different periods and in different countries and localities. Moreover, changes largely resulting from artificial selection and breeding occur as time passes after a writer has made his comparison. Also, popular terms follow no classificatory system. Terms like shepherd's cur and turnspit refer to the dog's function in a culture. A writer comparing the Polynesian dog to a barbet or a pomeranian is thinking mostly, it seems, only of the long hair characteristic of these two breeds. Seeking to discover what each breed looked like at the time the comparison was made leads into a fascinating maze because the name of each breed has an associated literature so controversial that one concludes that the correct term for a writer about dogs is not scientist but dogmatist. George Forster, then, is exceptional in referring to a particular illustration of the European breed with which he compares the New Zealand dog.

George Forster's description of the dogs of

the Society Islands is identical in both his German (1778, I: 285–286) and English (1777, I: 377–378) editions, but the former is more often cited by the German classifiers. Of an exploratory walk that he and Dr. Anders Sparrman took on Huahine, Society Islands, in September, 1773, he states:

On this walk we saw great numbers of hogs, dogs, and fowls. The last roamed about at pleasure through the woods, and roosted on fruit-trees; the hogs were likewise allowed to run about, but received regular portions of food, which were commonly distributed by old women. We observed one of them in particular, feeding a little pig with the sour fermented bread-fruit paste, called mahei; she held the pig with one hand, and offered it a tough pork's skin, but as soon as it opened the mouth to snap at it, she contrived to throw a handful of the sour paste in, which the little animal would not take without this strategem. The dogs in spite of their stupidity were in high favour with all the women, who could not have nursed them with a more ridiculous affection, if they had really been ladies of fashion in Europe. We were witnesses of a remarkable instance of kindness, when we saw a middle aged woman, whose breasts were full of milk, offering them to a little puppy which had been trained up to suck them. We were so much surprised at this sight, that we could not help expressing our dislike of it; but she smiled at our observation, and added, that she suffered little pigs to do the same service. Upon enquiry, however, we found that she had lost her child, and did her the justice amongst ourselves to acknowledge that this expedient was very innocent and formerly practiced in Europe. The dogs of all these islands were short, and their sizes vary from that of a lap-dog to the largest spaniel. Their head is broad, the snout pointed, the eyes very small, the ears upright, and their hair rather long, lank, hard, and of different colours, but most commonly white and brown. They seldom if ever barked, but howled sometimes, and were shy of strangers to a degree of aversion.

Early classifiers, being interested in description rather than in causes of variation in the Polynesian dog, ignore the Forsters' opinions on why Polynesian dogs acted differently from European dogs and what effects such external factors as food, care, education, and climate had on them. These opinions are first shots, broad and random, at an important problem. Almost 75 years were to pass before the classifiers began to take a dynamic view about the peculiarities of the Polynesian dog.

J. R. Forster (1778: 200–201, 372) writes that the individuals in the animal kingdom in the South Seas show less variety than those in the plant kingdom:

Domestication, the great cause of degeneracy in so many of our animals, in the first place, is here confined to three species; the hog, dog, and cock; and secondly, it is in fact next to a state of nature in these isles. . . . The dog being here merely kept to be eaten, is not obliged to undergo the slavery, to which the varieties of that species are forced to submit in our polished countries; he lies at his ease all the day long, is fed at certain times, and nothing more is required of him; he is therefore not altered from his state of nature in the least; is probably inferior in all the sensitive faculties to any wild dog (which may perhaps be owing to his food), and certainly, in no degree, partakes of the sagacity and quick perception of our refined variety.

He also notes that the hogs and dogs "are very prolific, thrive in the fine climate amazingly well, and soon come to maturity. . . ."

George Forster (1777, I: 235, 243), after remarking that "it is owing to the time we spend on the education of dogs that they acquire those eminent qualities which attach them so much to us . . .," suggests that the fish or vegetable diet has altered canine disposition to make Polynesian dogs stupid. Such education as they get, he says, has "perhaps likewise grafted new instincts" that have led New Zealand dogs to eat the dead of their own species and the remains of their masters' cannibal feasts.

Until 1922 when George M. Thomson incorporated it into his monograph on New Zealand plants and animals, the following description by Crozet was generally overlooked by classifiers outside of New Zealand. Of the dogs that he saw in 1772 in New Zealand, Crozet (Roth, 1891: 76) writes:

They have absolutely no other domestic animal than the dog. The dogs are a sort of domesticated fox, quite black or white, very low on the legs, straight ears, thick tail, long body, full jaws but more pointed than that of the fox, and uttering

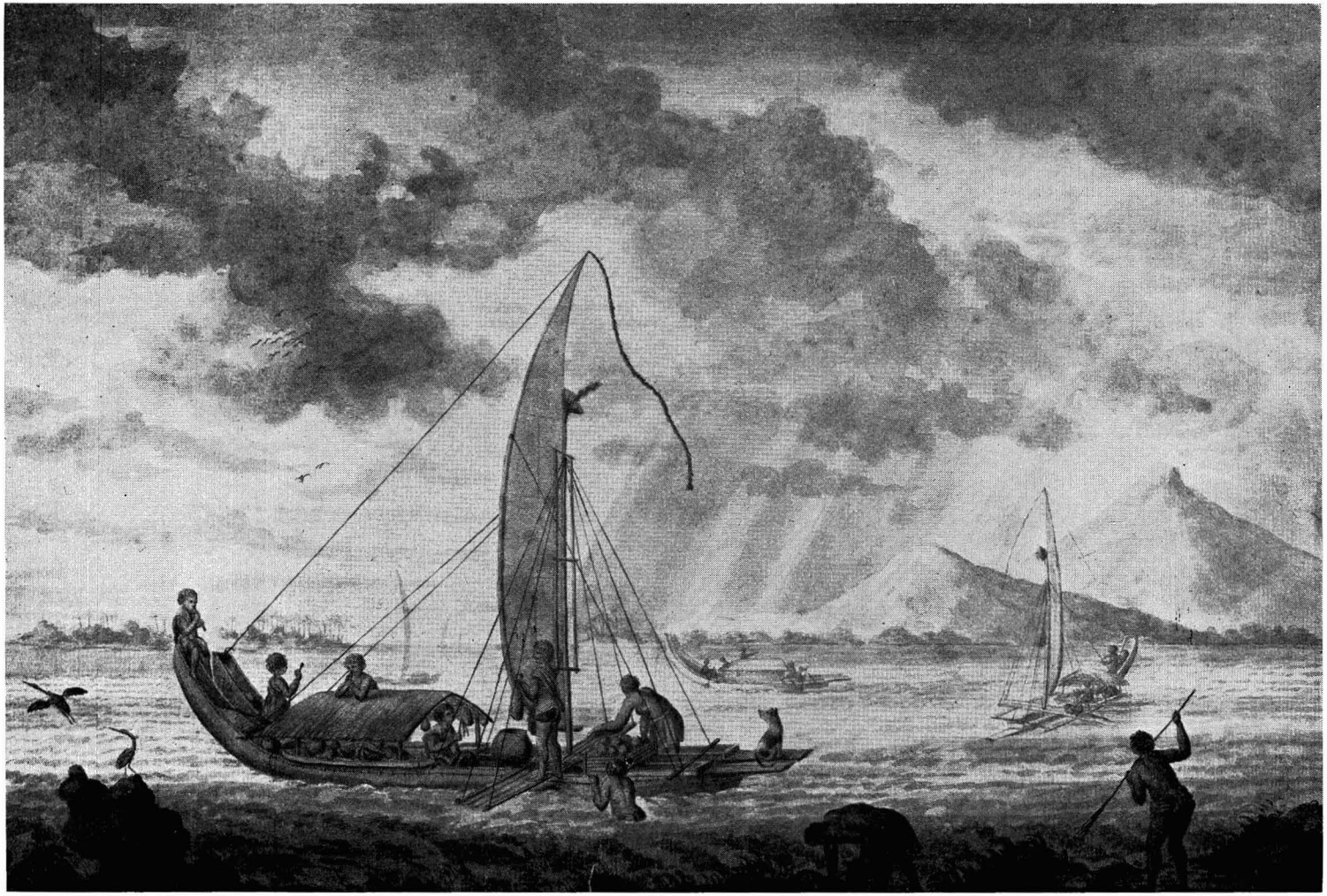

FIG. 5. "Double canoes. Tipaerua." Society Islands, probably during Captain Cook's first voyage. A previously unpublished sketch in the British Museum. A dog is sitting on the aft deck.

the same cry; they do not bark like our dogs. These animals are only fed on fish, and it appears that the savages only raise them for food. Some were taken on board our vessels; but it was impossible to domesticate them like our dogs, they were always treacherous, and bit us frequently. They would have been dangerous to keep where poultry was raised or had to be protected; they would destroy them just like true foxes.

The fourth primary describer of Polynesian dogs during the eighteenth century is Lieutenant King. After Cook's death King's journal was used to complete the official journal of the third expedition. Although King saw living native dogs in abundance before any known European contact had occurred with the Hawaiian Islands, which Cook's third expedition discovered, his account was little known to taxonomists. Without citing his source, F. L. Walther in 1817 seems to be the first to use it. In King's description written in March, 1779, the interest shown in the causes of the peculiar behavior of the dogs perhaps reflects that of the Forsters. For the first time an observer mentions the achondroplasic condition of the legs. Crozet appears to be the first to mention the long body. King writes (Cook, 1784, III: 118):

The dogs are of the same species with those of Otaheite, having short crooked legs, long backs, and pricked ears. I did not observe any variety in them, except in their skins; some having long and rough hair, and others being quite smooth. They are about the size of a common turnspit; exceedingly sluggish in their nature, though perhaps this may be more owing to the manner in which they are treated than to any natural disposition in them. They are, in general, fed and left to herd with the hogs; and I do not recollect one instance in which a dog was made a companion, in the manner we do in Europe. Indeed, the custom of eating them is an insuperable bar to their admission into society; and, as there are neither beasts of prey in the island, nor objects of chase, it is probable that the social qualities of the dog, its fidelity, attachment, and sagacity, will remain unknown to the natives. The number of dogs in these islands did not appear to be nearly equal in proportion to those in Otaheite. . . .

There are as many different descriptions of turnspits as there are describers, because "turnspit" was the name for any dog in Europe or the British Isles that was taught to run around inside a treadmill wheel to work a roasting spit. Whether or not it was a distinctive breed, and if so, of what kind and of what ancestry, makes for an interesting argument. Some who consider it a distinctive breed identify it as a descendant of the short-legged pariah dog; others perhaps think only of a line of descendants of some capable and admired local turner of a roasting spit, whose pups were sought as likely to be equally teachable, capable, and physically suitable. In general, a medium-sized, sturdy, teachable dog was used. Sometimes the turnspit is described as having a long back, short legs, straight or crooked, and fur that was shaggy and sometimes spotted. An early English reference to mongrels that were trained to turn the spit or to dance to drums and a lyre is dated 1570 (Davis, 1949: 34). The last was used in Wales and Germany about 1870, according to Vesey-Fitzgerald (1948: 728–729), who shows a sketch of a turnspit; when suitable dogs became scarce, a dog, which alternated with a companion, was paid about 6 d. a day at the most.

PENNANT AND SOME EARLY GERMAN TAXONOMERS

The famous "Third Edition" of Thomas Pennant's *History of Quadrupeds* is the often unacknowledged source used by later zoologists

FIG. 6. Detail of dog in Figure 5. This is the best picture I have found of what seems to be a native Polynesian dog: long muzzle, oblique eyes, prick ears, large head, stocky body, short legs, scraggly tail, patchy color, coarse hair, with only the alert look alien to descriptions.

FIG. 7. "Canoe of Ulietea." Raiatea, Society Islands, probably during Captain Cook's first voyage. A previously unpublished sketch in the British Museum. A boy at the left clutches what looks like a dog.

for information, secondary in origin though it is, about Oceanic dogs. J. M. Bechstein, who translated this edition into German in 1799, adds a little interpretation which scholars using his translation quote. Neither Pennant nor Bechstein gives a binomial classification of the Polynesian dog.

Pennant is probably the first to make fairly explicit two problems which still recur and are still unsolved. The first centers about whether or not there was more than one variety, or breed, of Polynesian dog, and if so what the distinctive characters of each were. Pennant distinguishes two varieties on the basis of the length and quality of the hair. The second problem concerns the relationship, if any, of the native dogs in the entire Pacific area to each other and to the Eurasiatic dogs, and the determination of the center of their geographical distribution to the islands. Pennant, discussing Polynesian, Australian, and New Guinea dogs, regards them (if I interpret his often ambiguous statements correctly) as derived from New Guinea, and separable into three, perhaps four, varieties. They are the New Holland (Australian) dingo, the Polynesian dog resembling the shepherd's cur, the Polynesian dog resembling the barbet, and the New Guinea dog which he regards as ancestral to at least the Polynesian "currish fox-like dog" and perhaps to others. Pennant's statements are so ambiguous, however, that each reader interprets them differently.

Pennant (1793, I: 243–244; Bechstein, 1799, I: 258–160) writes as follows:

> Dogs (brought originally from New Guinea), are found in the *Society Islands, New Zeland,* and the *Low Islands:* there are also a few in New Holland. Of these are two varieties.
>
> 1. Resembling the sharp-nosed pricked-ear shepherd's cur. Those of *New Zeland* are of the largest sort. In the *Society Islands,* they are the common food, and are fattened with vegetables, which the natives cram down their throats, as we serve turkies, when they will voluntarily eat no more. They are killed by strangling, and the extravasated blood is preserved in *Coconut* shells, and baked for the table. They grow very fat, and are allowed, even by *Europeans* who have got over their prejudices, to be very sweet and palatable.
>
> But the taste for the flesh of these animals was not confined to the islanders of the *Pacific Ocean.* . . .
>
> 2. The *Barbet,* whose hair being long and silky, is greatly admired by the *New Zelanders* for trimming their ornamental dress. This variety is not eaten. The islanders never use their dogs for any purposes but what we mention; and take such care of them as not to suffer them even to wet their feet. They are excessively stupid, have a very bad nose for smelling, and seldom or never bark, only now and then howl. The *New Zelanders* feed their dogs entirely with fish.
>
> The Marquesas, Friendly Islands, New Hebrides, New Caledonia, and Easter Isle, have not yet received those animals.

For New Guinea, Pennant cites as his source Captain Thomas Forrest (1779: 97, "table" 11). What Pennant calls a table is given as a plate by Forrest. Forrest, a visitor on the New Guinea coast in the early part of 1775, twice (1779: 97 and 103) remarks on the native dogs around "Dorry" (Daru). He observed natives setting out in boats with two or three "fox-looking dogs . . . a dog they call Naf." The dogs were used to hunt wild pigs that in swimming from islet to islet sometimes held on to the tail of the preceding pig. Forrest writes on seeing men on another occasion setting out in their boats to go pig-hunting, "In each boat was generally a small fox looking dog," and then in his plate11 (Figs. 19, 20) he depicts such a scene. Forrest gives no further data about the appearance of the dog.

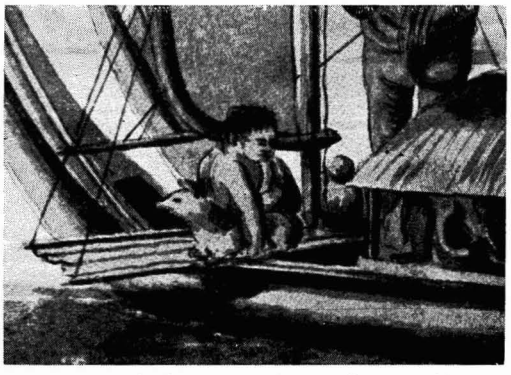

FIG. 8. Detail of Figure 7 showing boy clutching an animal that looks like a dog. Or is it a pig?

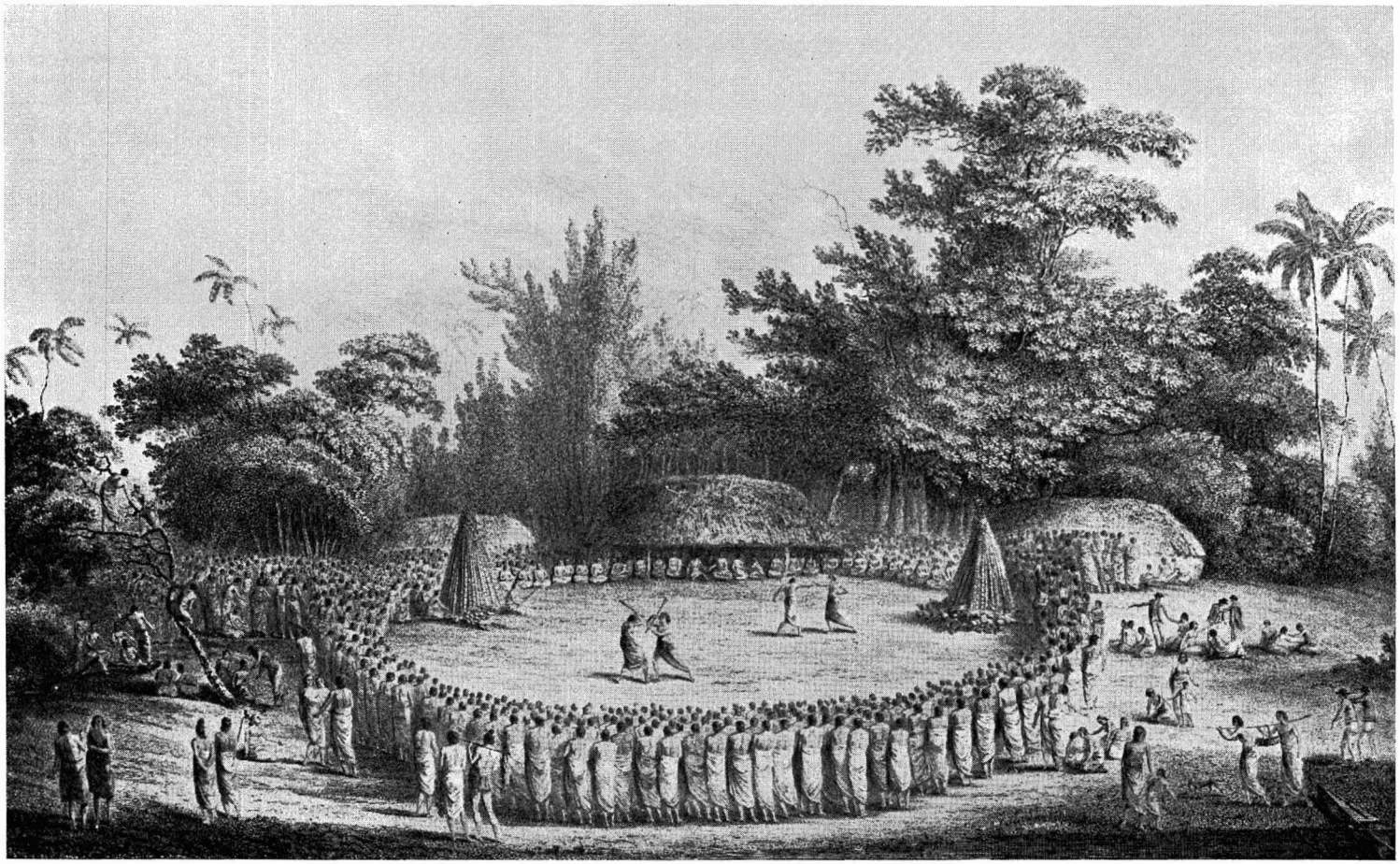

FIG. 9. "The reception of Captain Cook, in Hapaee" (Cook, 1784 : Atlas, pl. 14). Hapai, Tonga Islands, on Captain Cook's third voyage. A scrawny dog is at the lower right outside the circle of people.

Pennant considers (1793, I: 143) that "New Guinea must have originally supplied with dogs those south sea islands which . . . (have them)." New Guinea, he continues, was probably the "Mother of Lands," the homeland, as native priests also claim, of men, dogs, hogs, poultry, and rats; here, Pennant states, is found the "same species of hog, and the currish fox-like dog" as in Polynesia. If Forrest is his direct source, rather than inspiration, for this conclusion I do not find the reference anywhere in Forrest's account of his voyage. Pennant's puzzling introductory statement given earlier seems to mean that both Polynesian and Australian dogs came from New Guinea.

Pennant gives a description of the "New Holland dog" (1793, I: 247).

Pennant's undesignated authorities for his other statements about the Polynesian dog are undoubtedly members of Cook's expeditions, especially the Forsters, and occasionally Cook himself. Cook, on his first visit to the Society Islands, describes (Hawkesworth, 1773, II: 152–153) how delicious a young fat dog is and how to cook a dog in native fashion after it has been strangled and its blood caught in a coconut shell. Others on that expedition, Sydney Parkinson for example, also write, not always favorably, about their first experience in eating dog meat. Contrary to Pennant, George Forster states that the Maoris ate dogs, and that Society islanders forcibly fed baby pigs, not dogs. That they similarly fed puppies is likely but Forster does not say so. Also contrary to Pennant, dogs were not common food in the Society Islands (J. R. Forster, 1778: 372).

I have not located Pennant's source about the long-haired New Zealand dog being protected against getting its feet wet. The statement may be a misinterpretation or extension of the meaning of Forster's reference to the Maoris having their dogs with them in their canoes. Pennant's description of the Maori dog's hair as silky, a detail that Walther quotes from Pennant, is unsupported by the Forsters; the younger Forster says the opposite. However, the latter in a statement (1777, II: 40), that classifies apparently overlook, mentions that the dogs at Tiookea (Takaroa), Tuamotus, had "fine long hair of a white colour." That the Polynesian dog was "fox-like" may echo Cook's journal (1784, I: 153) in which the New Zealand dog is called "a sort of fox-dog." Crozet makes the same point but his description was overlooked. Pennant's list of islands that at the time of European discovery lacked dogs comes from J. R. Forster (1778: 188); Captain Cook introduced dogs into some of these islands.

Bechstein's German translation of Pennant's work inserts the adjective "Australische" to describe the barbet. The adjective, absent from Pennant's English edition, is puzzling because it is not clear whether Bechstein uses the term to mean "Australian" or "southern." Early writers usually call Australia New Holland so that an adjective referring to the country would not be "Australische." It is not derived from the classification of the Polynesian dog as *Canis australis* because, so far as I can determine, that does not appear until later.

Adding to the confusion, F. L. Walther (1817: 23), who depends largely on Bechstein's translation and a little directly on George Forster, applies the name "Australische Hund" to his *Canis familiaris villaticus, meridionalis*. This is not the dog Pennant likens to the barbet but the variety he compares with the shepherd's cur. Perhaps Walther purposely reverses Pennant's two varieties to get back closer to Forster, the original source. Referring to Bechstein (1799, I: 258) and George Forster (1778, I: 286) as his sources, Walther states that his subvariety *meridionalis* is found in the Society and the Sandwich islands, also in New Zealand, and a

FIG. 10. Detail of the scrawny dog in Figure 9.

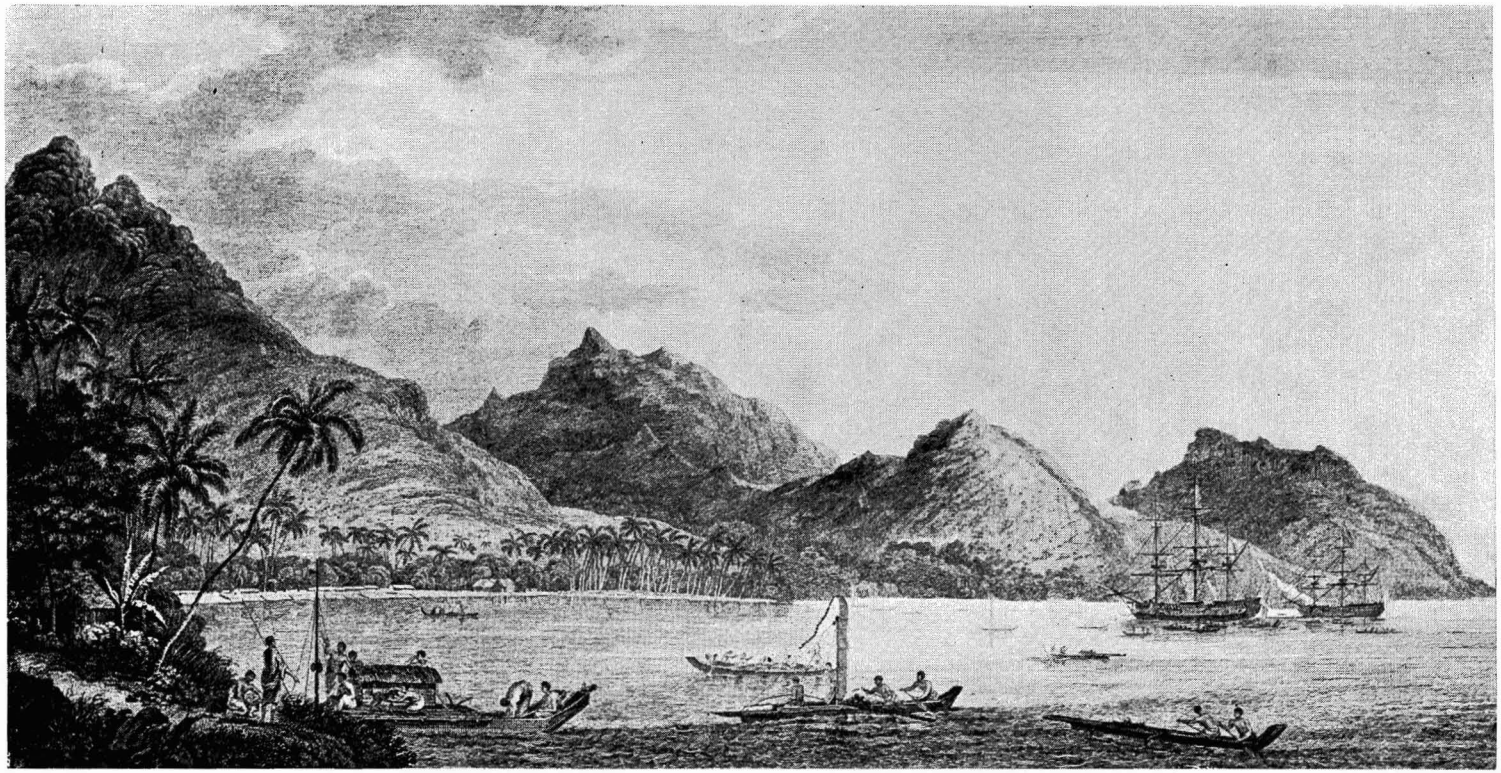

FIG. 11. "A view of Huaheine" (Cook, 1784 : Atlas, pl. 31). Huahine, Society Islands, on Cook's third voyage. In the canoe at the left a man is kneeling and holding a dog still.

few in New Holland. These dogs, he adds, had short legs, long backs, pricked ears, an occasional howl but no bark. They were shy towards strangers and stupid. They were eaten. Walther drops the Low Islands (the Tuamotus are probably meant) from the list and substitutes the Sandwich (Hawaiian) Islands. The references to the Sandwich Islands and to the dogs being long-backed and short-legged (he does not include the fact that the legs were often crooked) indicate that Walther, although he does not give his source, was probably familiar with King's description. He probably includes New Holland with the islands having his *meridionalis* because he interprets Pennant's ambiguous introductory statement to refer only to the first of the varieties described.

Walther has another Polynesian subvariety which he calls *Canis familiaris villaticus, novae Zeelandiae,* the New Zealand dog. He describes it from sources that he gives as Bechstein (1799, I: 258) and George Forster (1778, I: 165). This dog, he says, resembled a shepherd's dog, and had long silky hair, pricked ears, and different colors. It was found in New Zealand where it was fed almost exclusively on fish and kept only for its hide, from which festive attire was made. It was not eaten. It was very stupid, had a poor sense of smell, and rarely barked but only howled now and then.

Two more South Pacific dogs classified by Walther (1817: 21–24) are the Australian dingo, *Canis familiaris villaticus, novae Hollandiae,* and the "fox-like dog of New Guinea," *Canis familiaris villaticus, novae Guineae.* He gives as sources Bechstein (1799, I: 260) and Forrest's ("Forster") German edition (1782: 121, 126). An error in his book which regularly gives Forster when Forrest is meant is continued by later writers.

Walther obviously then makes explicit and gives binomial classifications to four Pacific varieties that he distinguishes and that are not so explicit in Pennant's account. Moreover, he (1817: 21–24) puts all four in the same larger classification *villaticus* as four Old World breeds, to make a total of eight "national breeds" in *C. familiaris domesticus.* The Old World breeds in *villaticus* are the common, black, long-haired German house dog with curled-over tail, *germanicus* (one of Walther's lists inserts the Lapland dog next); the Kalmuk dog, *calmuccorum;* the Pyrrenes dog, *pyrenaicus;* and that of Pomerania, *pomeranus.* Walther leaves no doubt that he regards the Pacific dogs as belonging to the same genus, species, and variety *(Canis familiaris villaticus)* as the Old World breeds of domesticated house dogs. So far as I can determine, he is the first even to attempt to classify the Polynesian dog by genus and species.

H. G. L. Reichenbach (1836: 46, pl. 72) does not describe the dog he classifies as *Canis otahitensis,* but his sketch (Fig. 18) shows some dogs whose most remarkable feature is a long, flowing tail like that of a horse. The source of the artist's inspiration is not stated. Perhaps Reichenbach describes the dog and cites his authority on page 141 in his "Naturg. Raubth." (perhaps, in full, *Naturgeschichte Raubsäugethiere*) which I have not seen but which Leopold J. Fitzinger (1867: 400–401) quotes without giving the complete title. Fitzinger states that Reichenbach gives two other classifications of the Polynesian native dog. They are *Canis familiaris orthodotus* and *Canis familiaris orthotus otahitensis.* The spelling of the sub-species varies. Reichenbach (1836: 22) classifies the dingo both as *Canis Dingo* or, according to Fitzinger (1867: 817), *Canis familiaris orthotus Dingo* ("Naturg. Raubth.": 147, 354), and as *Chrysaeus Australiae* ("Naturg. Raubth.": 366).

Consideration of Fitzinger's own classifications will be deferred until later.

FIG. 12. Detail of Figure 11 to show a long-legged, flop-eared, spotted dog with a long muzzle and short, half-curved tail.

C. G. A. Giebel (1859: 844), who classifies the dogs of New Zealand, Society Islands, and Sandwich Islands as *Canis familiaris otahitensis,* does not describe or figure them or give his sources. His geographical distribution echoes that of Walther in dropping the Low Islands from Forster's original list and substituting the Sandwich Islands. Giebel's classification resembles that of Reichenbach. I have not seen Giebel's later books. He classifies (1859: 842) the dingo both as *Canis familiaris* and as *Lupus familiaris.*

THE MID-NINETEENTH CENTURY MAORI DOG AND THE DINGO

Giebel and Reichenbach each gives one classification of the dingo (also called warrigal) that excludes it from the genus *Canis.* This is a reminder that Blumenbach's classification in 1780 of the native dog of Australia (absent from Tasmania) as *Canis familiaris dingo* was sometimes questioned. Some classifiers did not consider the dingo a true dog. Others, who did, agreed on practically only one point, according to Frederic Wood-Jones (1925: 352), which is "That the Dingo is some sort of a dog." Many of the opinions, he observes (p. 350), "rest on nothing more than a mere haphazard statement founded on no proper examination of the characters of the animal." The same can be said about the Polynesian *Canis.*

It is already evident that one cannot talk about the Polynesian dog without mentioning the dingo and other native dogs of the Pacific. The following summary of some material on the New Zealand dog also shows why even this cursory survey of the Polynesian dog cannot completely ignore the dingo. However, the name of the dingo is linked only with that of the New Zealand dog, principally because more has been written about the Maori dog than about other dogs of Polynesia.

FIG. 13. A Hawaiian scene (Honolulu Academy of Arts, Bishop Museum Negative 20599) by Choris, 1820, previously unpublished. The large dog at the left looks foreign. The smaller dog by the pig somewhat recalls the odd creature in Figures 7 and 8.

By the early part of the nineteenth century the New Zealand dogs were mongrelized. The description in 1820 by Captain Bellingshausen (1945: 215) is the last, and in fact the only one in the nineteenth century, which inspires even a little confidence that it is about a native dog. He mentions "rather a small breed of dog . . . not large," with "thick tail, erect ears, a broad muzzle, and short legs." Soon packs of wild dogs became such a nuisance and danger that European settlers imported dogs from Australia to use in hunting these wild packs. Some of the imported dogs may have been dingos, or had a dingo strain, to add to the existing mixture. In Australia the dingo itself was such a nuisance to settlers that it had a price on its head. Although it too had crossed with introduced dogs, Wood-Jones (1925: 355–356) considers that pure dingos still existed in the twentieth century even in those cattle districts settled the longest.

Consideration of Wood-Jones' comparison of dingo crania with those of certain other carnivores will be deferred until later. A general description (Le Souef and Burrell, 1926: 89–93, pl. 9, a photograph) will provide a basis for the discussion to follow. The dingo, which howls but does not bark, has an elongated head with a pointed nose and well-developed canine teeth. It has straight toes with blunt claws, five on the forelimbs and four on the hind limbs. Its rather long, coarse hair is tawny except for greyish underfur. The top of the head and the dorsal sections are generally darker, the under parts lighter; the tip of the brush-tail, the feet, and the chest are generally white. The cheeks and the outside of the legs are whitish-tawny. Regional color variations include white dogs with some tawny shadings, and black dogs with tan points and face. The head and body measure 715 mm.; the tail, 350 mm.; the height at the shoulder, 530 mm., and at the ear 90 mm. Wood-

FIG. 14. "Vue de Honolulu. Iles Sandwich" (Vaillant, Album, No. 45, Bishop Museum Negative 20588). The mid-1830's in Honolulu. A dog follows a Hawaiian couple.

Jones (1926: 349–350, 355) describes the ears as large, pointed at the tips, carried erect, and fringed with hairs; tails of wild dogs droop, those of pet dogs are usually carried erect; coats vary in color, with both black and red mentioned by early observers. Wood-Jones gives 1500 mm. as the length of the head and the body, but the tail is about the same length as that mentioned above; height is not given.

A description of the dingo, which is often quoted at second- and third-hand in early zoological studies, appears in connection with the sketch of the dingo female referred to earlier (Fig. 21). The description (Phillip, 1789: 274–275) identifies the animal as "Canis. Dog. Dog of New South Wales," and continues:

The height of this species, standing erect, is rather less than two feet: the length two feet and a half. The head is formed much like that of a *fox,* the ears short and erect, with whiskers from one to two inches in length on the muzzle. The general colour of the upper parts is pale brown, growing lighter towards the belly: the hind part of the fore legs, and the fore part of the hinder ones white, as are the feet of both: the tail is of a moderate length, somewhat bushy, but in a less degree than that of the fox: the teeth are much the same as is usual in the genus, as may be seen in the top of the plate where the animal is represented.

This species inhabits *New South Wales.* The specimen from which the annexed plate was

FIG. 15. Detail of Figure 14 to show a spotted dog with prick ears and a long tail.

taken, (a female) is now alive in the possession of the *Marchioness of Salisbury,* at *Hattfield-House,* and was sent over as a present to Mr. *Nepean,* from Governor *Phillip.* It has much of the same manners of the dog, but is of a very savage nature, and not likely to change in this particular. It laps like other dogs, but neither barks nor growls if vexed and teized; instead of which, it erects the hairs of the whole body like bristles, and seems furious: it is very eager after its prey, and is fond of rabbits or chickens, raw, but will not touch dressed meat. From its fierceness and agility it has greatly the advantage of other animals much superior in size . . . [examples of its nearly killing a French fox-dog and an ass]. . . .

A second of these is in the possession of Mr. *Lascelles,* of which we have received much the same account in respect to its ferocity; whence it is scarcely to be expected that this elegant animal will ever become familiar.

The dingo is a hunter which runs down its prey before killing it. Its hunting ability contrasts with that of the Polynesian native dogs, of which only the Maori dogs may in pre-European times have hunted wild ground birds. Some Maori dogs were trained to hunt. This hunting ability of some Maori dogs is mentioned in native traditions and post-European descriptions but there are no references to the custom by the earliest explorers to give complete confidence in these other sources of information (Luomala, 1960).

Although J. S. Polack, who travelled in New Zealand between 1831 and 1837, frequently mentions the dogs he encountered and classifies them, he nowhere specifically describes one or more of them. He writes (1838, I: 308):

Of quadrupeds, indigenous to the country, there are none. The karárahé, or dog (Canis Australis), which, when young, is known as *kuri,* has been an inhabitant some two or three centuries. A tradition yet exists of his having been given to the natives, in times remote, by a number of divinities, who had made a descent on these shores.

This sagacious animal has dwindled down to the lowest grade of his interesting family, which may be easily accounted for from the stinted allowance that has come to his share for many generations.

He also writes (*op. cit.,* p. 310), "The former name of a dog in the country was *pero,* which in some measure substantiates the supposition of Juan Fernandez having visited the country, *pero* signifying a dog in the Spanish language."

Polack discursively alternates between eulogies of the devotion of New Zealand dogs to their owners and denunciations of them as mongrels and "curs of the lowest degree in the scale of animal creation" and "the greatest pest in the country" (1836, I: 66, 74, 135, 141, 155, 156, 230, 308–314, 389, 400; II: 254). The behavior of the barking, pugnacious, and sheep-killing dogs that Polack saw suggests that few if any were of the pre-European native varieties or unmixed with European breeds.

Ernest Dieffenbach (1843, II: 184), also familiar with New Zealand of the early nineteenth century, quotes Polack and adds further observations:

The dog of the natives is not the Australian dingo, but a much smaller variety, resembling the jackal, and of a dirty yellowish colour. It is now rarely met with, as almost the whole race of the island has become a mongrel breed. A native dog of New Zealand is not a sufficiently powerful animal to do harm to domestic sheep, but it is different with the introduced and mongrel dogs, mostly bull-terriers or bloodhounds, which are savage pig-dogs although with men they are great cowards. In want of better sport they hunt young birds, and to this cause the scarcity of many indigenous birds must be ascribed. The natives also call the dog sometimes 'Pero' (Spanish): they have a tradition that their ancestors brought the dog with them when they first peopled New Zealand. Is it not probable, from the Spanish name, that the dog was brought to them by navigators of that nation before the time of Tasman?

Tasman, it will be recalled, reported the discovery of New Zealand in 1642 though he did not land.

Dieffenbach (II: 45–47; I: 417) repeats this information with slight variations and additions. The color of the dog is "reddish brown," the ears are "long and straight." The animal "rather resembles" the jackal whereas the dingo is like the wolf in size and shape.

John Edward Gray (who styled himself "F.R.S., British Museum") contributes a section on fauna to Dieffenbach's book. The part on the

dog begins with Dieffenbach's long paragraph quoted above. Yet despite Dieffenbach's flat denials that the dingo and the native New Zealand dog are the same, Gray (Dieffenbach, 1843, II: 184) identifies the New Zealand dog as "The New Holland Dog.—Canis familiaris Australis, Desm.; Canis Dingo, Blumenb." Without giving his source he adds that the dog is said to have been introduced from Australia. His dissatisfaction with his identification is hinted in his comment that "It would be interesting to institute an accurate comparison between these animals [Maori] and an Australian specimen." Gray also quotes Polack about the dog having been in New Zealand for two or three centuries.

Contrary to the impression given by Gray, A.-G. Desmarest (Gray abbreviates his name as Desm.) does not describe the Polynesian dog or equate the dingo with it. He writes (1816, VI: 454–455) about the "New Holland dog" and cites F. Cuvier's description of a specimen taken to France by F. Péron. Desmarest is also quoted on the dingo by William Youatt (1846: 41–43), who also writes of the Polynesian dog but without linking it to the dingo. Youatt refers to the Polynesian dog as "Canis Australis-karárehé, New Zealand dog," terms which, with other general statements, point to Polack as his unacknowledged source.

The question of the relationship of the dingo and the New Zealand dog is also raised by the contemporaries of Gray and Dieffenbach in New Zealand. By the nineteenth century the popular identification of any dog, wild or domesticated, in Polynesia with any native dog, either of Polynesia or of any other Pacific area like Australia, was guesswork. Nonetheless, arguments were common (and are easily started even now) as to whether any native dogs unmixed with European dogs survived, what native dogs

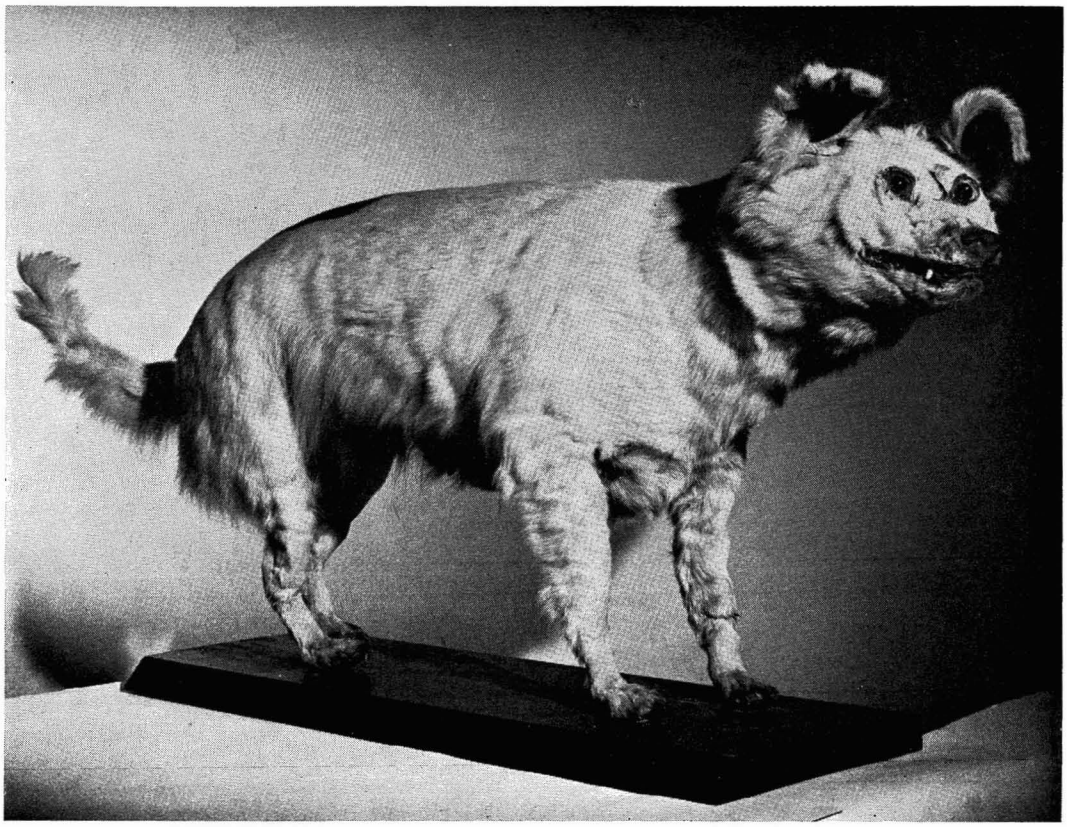

FIG. 16. Stuffed dog (B. 3527, Dominion Museum, Wellington, New Zealand) sometimes regarded as representative of the Maori native dog. Photo by Dominion Museum.

looked like, and what traits survived either in wild dogs or in domesticated dogs in native villages. Descriptions derived from natives were quoted, telling what they thought their ancestors' dogs looked like. To R. Taylor (1870: 604) the New Zealand dog or "canis familiaris kuri . . . was small and long-haired, of a dirty white or yellow colour, with a bushy tail." This dog, Taylor had learned from natives, had been brought when their ancestors first came to the islands. Taylor considers it "not improbable, however, that they found another kind already in the country, brought by the older Melanesian race, of a larger size, with long, white hair and black tail . . . said to have been very quiet and docile, and was known by the name pataka tawhiti, both these are now quite lost in the host of introduced ones." No support occurs for the theory of Melanesians having preceded Polynesians in occupying New Zealand. A. Reischek (1924: 100–101) writes about "Canis Maori" on receiving a dogskin mat said to have been made from hides of native dogs. The term "native" becomes increasingly vaguer in meaning as time passes; applied to dogs it might mean those of any breed that a Polynesian native owned.

George M. Thomson (1922: 64–70), who classifies the New Zealand dog as *Canis familiaris,* has assembled information about its appearance from the time of Crozet and Forster to the twentieth century. The material comes from early visitors, later travel writers and ethnographers, contributors to New Zealand newspapers and scientific journals, and personal correspondents. Included are statements indicating that arguments occurred which linked the names of the Australian dingo and the New Zealand native dog. For example, a certain settler writes (Thomson, 1922: 68) that in 1858 among the wild dogs that he killed were some yellow ones that "looked like a distinct breed. They were low set, with short pricked ears, broad forehead, sharp snout, and bushy tail. Indeed those acquainted with the dingo professed to see little difference between that animal and the New Zealand yellow wild dog." Like many other pioneers, this settler, in hunting wild dogs that harried people and livestock, had the help of his "kangaroo dog," imported from Australia

FIG. 17. "Le chien de berger" (Buffon, 1755, V : pl. 28). The shepherd's cur that is compared with the Maori and the Australian native dogs.

for hunting wild dogs. Not stated in the accounts is the breed of the kangaroo dog, whether dingo or mongrel.

None of the explorers of the seventeenth and eighteenth centuries mentions transporting native dogs for exchange between Australia and Polynesia, so that, as far as is known, crossbreeding in European times of dingos and Polynesian native dogs did not take place till after the eighteenth century. However, Polynesian dogs, it will be recalled, were introduced into dogless New Caledonia and New Hebrides by Captain Cook on his second expedition; and, in the first quarter of the nineteenth century, R. P. Lesson and P. Garnot (Duperrey, 1826, I: 123), natural scientists on the Duperrey expedition, abandoned at Port Jackson, Australia, the native dogs they had bought in New Ireland. Later I shall return to their comparison of these and other Melanesian and New Guinea dogs with the dingo. For the present, it is enough to note that although Europeans transported local dogs

around the Pacific in the early days of European travel, no one happens to mention any exchange of dogs between Australia and Polynesia that might have led to a mixture of local breeds.

Those who regard the dingo and the Polynesian dog as close kin ignore, however, the theory that the dingo may not be a true dog. Therefore, they do not raise the inevitable question, "Was the Polynesian native dog a true dog?" In fact, no one interested in the Polynesian dog appears to have expressed doubt that it belongs in *Canis,* except perhaps Elizabeth Morey (Im Thurn and Wharton, 1925: 188), who lived at the beginning of the nineteenth century in Tongatabu (where Cook, it will be remembered, introduced native dogs and the people also got some later from Fiji). She writes that "the natives hold in high estimation the flesh of a small sized animal of the dog kind, which many prefer to the finest fish." And, again in contrast to the dingo, the question has not been raised as to whether the Polynesian dog's wild ancestor was nearest a wolf, jackal, fox, or other carnivore.

The polyphyletic theory, that the various races of domestic dogs derive not only from the wolf but from the jackal, fox, and coyote, had famous followers like I. G. Saint-Hilaire and Charles Darwin, although the latter (1897, I: 216) felt none too convinced. The polyphyletic theory still has some followers, although the evidence offered has rested less on studies of the less plastic features like teeth and skulls than on superficial, modifiable traits like, for example, the carriage of the ears and tail or the quality and color of the coat. Discussions of the polyphyletic or monophyletic origin of the domestic dog usually bypass the Polynesian native dog but not the dingo; yet, as has been noted, in the mid-nineteenth century European settlers in New Zealand debated whether or not the dingo of Australia and the native dog of New Zealand were related.

Wood-Jones (1926) compares a series of 20 dingo skulls, selected at random from a collection of corpses, with 10 other series or individuals of what are probably mostly European breeds and also compares these series with crania of wolves, foxes, and jackals. Tables and sketches accompany his study. His purpose to determine the place of the dingo led to conclusions that supported both Blumenbach's classification of the dingo as *Canis familiaris* and Cuvier's belief that the dingo is "the most primitive true dog." Wood-Jones finds that the dingo's teeth, especially the upper carnassial, are relatively more nearly the size and form of those of the wolf than are those of any other breed of dog studied. Long isolation in Australia apparently has stabilized the resemblances to the teeth of the wolf that Wood-Jones regards as ancestral to domesticated dogs. The teeth of wolves and dogs differ in certain significant characteristics from those of the jackal and the fox. The dingo, Wood-Jones suggests, probably came with man by a sea route to Australia. A fact derived from his comparison that particularly impresses him is that the series of dingo skulls shows "a degree of uniformity far greater than that seen in any series of skulls of dogs of any breed" (1926: 355).

Wood-Jones' study is regarded as "the most compelling account favoring the northern wolf as the original ancestor of the dog" (Vevers, 1948: 5). N. A. Iljin (1941: 410), after an 8-year genetical study in Russia of the offspring of hybrids produced by crossing a female black mongrel sheep dog and a male wolf, gray in color and caught wild, also suggests "the *possibility* of the origin of the various races of *Canis familiaris* from a single wild species, viz. *C. lupus.*" These two studies have had much to do with discrediting the polyphyletic theory.

CLASSIFICATIONS BY FITZINGER AND SMITH

In the mid-nineteenth century, L. J. Fitzinger and Charles Hamilton Smith, though chronicling the increasing mixture between Polynesian dogs and foreign dogs, show some interest in the

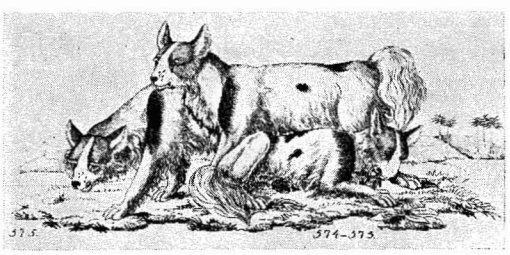

FIG. 18. An imaginative artist's idea of *Canis tahitiensis* (Reichenbach, 1836 : 46, pl. 72).

same questions that the Forsters and King raise about the pre-European origin of the causes of what are regarded as either degenerate or primitive traits in the Polynesian dog. Neither Fitzinger nor Smith had specimens to study.

Among the peculiar traits of the Polynesian dog were its inability to bark, its predominantly indolent disposition (except perhaps in New Zealand), its erect ears, long back, short and crooked legs, comparatively large head with small eyes, and pointed muzzle. More interest has been shown in identifying the presence of these traits in mongrels believed to contain native strains than in determining the origin of the traits. The traits (except perhaps the laziness) when present, whether in dogs of Polynesia or of other parts of the world, are called primitive; that is, they are regarded as traits shared with the wild ancestor of the dog whatever it is thought to have been, whether wolf, fox, or other animal. Sometimes these same traits are called degenerate; the implication occasionally is that degeneration has occurred from a more advanced form toward the primitive form. Both the idea of primitiveness and of degeneracy toward primitiveness seem to be mixed in the views of the Forsters and King.

That the same perhaps is true of the views of Smith and of Fitzinger, although the former refers to degeneracy and poor breeding and the latter speaks of acclimatization, is suggested by their famous contemporary's discussion of the origin of breeds among dogs.

Charles Darwin (1897, I: 40) writes of the deteriorating effects of diet and climate on imported dogs, which have led to their "reversion to a primordial condition which many animals exhibit . . . when their constitutions are in any way disturbed." Darwin also considers the effect of what are now called mutations:

> Some of the peculiarities characteristic of the several breeds of the dog have probably arisen suddenly, and, though strictly inherited, may be called monstrosities; for instance, the shape of the legs and the body in the turnspit of Europe and India. . . . A peculiarity suddenly arising, and therefore in one sense deserving to be called a monstrosity, may, however, be increased and fixed by man's selection . . . the most potent cause of change has probably been the selection, both methodical and unconscious, of slight individual differences,—the latter kind of selection resulting from the occasional preservation, during hundreds of generations, of those individual dogs which were the most useful to man for certain purposes and under certain conditions of life.

Pictures on Egyptian monuments from about 3400 B.C. to 2100 B.C. show dogs, he points out, which include a turnspit with short crooked legs resembling the existing variety. He also refers to a description of an Indian pariah dog with similarly short, crooked legs. Such legs are common enough in various animals, Darwin finds (1897, I: 17), so he rejects the Egyptian counterpart of the "monumental animal as the parent of all our turnspits." In other words, a breed like the turnspit, sometimes compared with the Polynesian native dog, might arise through mutations more than once in different parts of the world. However, the latter-day genetical studies on dogs by C. R. Stockard (1941) have shown that the achondroplasic factor is dominant in inheritance. Therefore, the dogs with the deformed-looking bandy legs and peculiar muzzles pass on these traits by Mendelian laws of inheritance to their descendants. When achondroplasic features inhibit natural functioning, the breed becomes extinct.

Mongrels in native Polynesian villages that exhibit peculiarities reminiscent of those the native dog is thought to have had are generally assumed to have some native-dog ancestry. The possibility that at least some of these mongrels might be mixtures only of European breeds that, through degeneration or mutation, have come to duplicate independently the primitive or degenerate traits of the native dog has not been considered, except perhaps with the regard to the trait of nonbarking. All howling wild dogs are not kin to the indigenous dogs in breed, for, according to common knowledge, European dogs which become feral may lose the ability to bark and resort only to howling. They recover their bark if they return to a domesticated life.

C. H. Smith (1845, XIX: 210) writes of what he calls the poi dog (*C. Pacificus*), the *ilio* of the Hawaiians and the *uri-mahoi* of the Tahitians: "In form this variety bears marks of decrepitude: the head is sharpened at the muzzle, the ears erect, the back long, the limbs crooked;

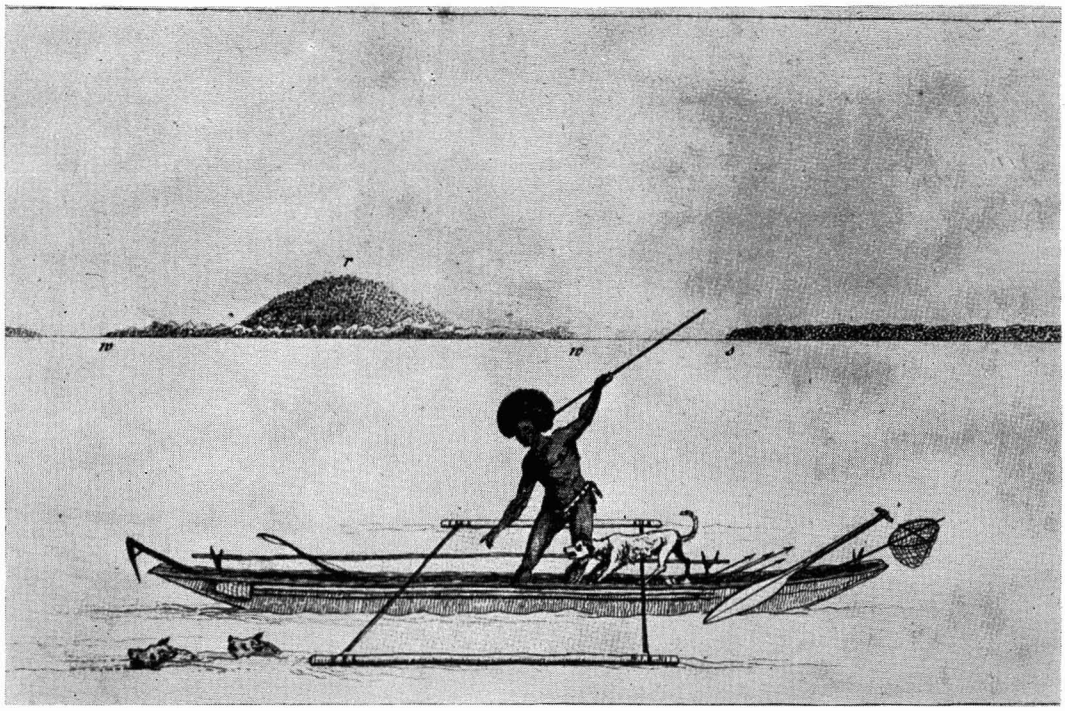

FIG. 19. A Papuan and his dog hunting wild pigs (Forrest, 1779 : 59, pl. 11).

the hair is smooth, but retains its primitive livery of tan or rusty ochre colour." The silent and lazy dog, Smith continues, subsists on a vegetable diet of breadfruit and of poi made from taro. Entirely reserved for the table, the dog is a real delicacy to the natives. In the Society Islands, Smith adds, it is now mixed in breed, but in the Hawaiian Islands the "pure breed of Poe dog is better protected." Mentioning the skinned dog that Frederick Bennett saw suspended over a restaurant door in Honolulu in the 1830's, Smith states that the poi dog is the size of a terrier, with dull expression, tail straight or slightly curled, brown livery, feeble but shrill bark, and in disposition gentle and indolent. The poi dog, he concludes, "in aspect presents the mixed forms of a fox-dog, turnspit, and terrier." It is just as badly shaped, he says, as the turnspit which is long-backed, heavy-bodied, and either straight- or crooked-legged; and like the turnspit and the pariah dog it shows poor breeding, degeneracy, and malformation.

Smith (1845, XIX: 210–211, 296), who like most writers on the native dog depends on written descriptions, gives various classifications of Polynesian native dogs. He distinguishes apparently between the "poe dog" (poi dog) of the Society and Sandwich islands and its relative, the "New Zealand dog." He puts the poi dog into three classifications, namely, *Canis feri, Canis terrarius,* and *Canis Pacificus,* Nob. The

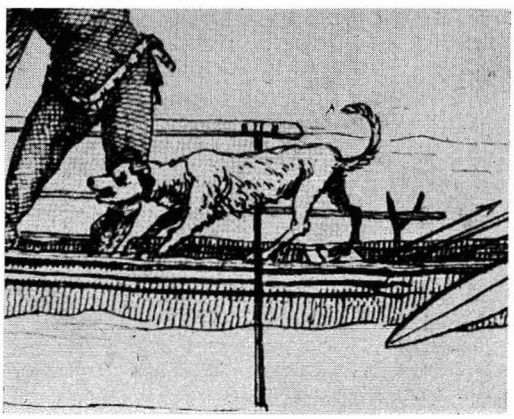

FIG. 20. Detail of Papuan native dog in Figure 19.

New Zealand dog is in the first two classifications and may be in the third, but Smith is not clear upon this point. A search of zoological indices has not revealed "*C. Pacificus,* Nob." among new species, or any productive clue either to the identity of the natural scientist whose name is abbreviated as "Nob." or to the location of his original description. The classification continues to be cited, however, probably secondarily from Smith (Davis, 1949: 12).

Under *Canes feri,* Smith lists wolf dogs, watch dogs, greyhounds, hounds, cur dogs (terrier, Lapland cur, pariah dog, poi dog, New Zealand dog, Patagonian dog, Tierra del Fuego dog), and mastiffs. His second classification *"Canis terrarius—Canes Domesticii"* he describes as being below middle size in height and having a round head, pointed muzzle, erect ears, large and prominent eyes, and the characteristics of being sagacious, noisy, and watchful, and separable into three distinct species. He includes here terriers, pariahs, poi dogs, New Zealand dogs, and the Patagonian and Fuegian dogs. His third classification of the poi dog is *Canis Pacificus,* Nob. His two classifications of the dingo, by the way, are *Chaon Australiae* and *Chryseus Australiae.*

Smith is vague about his sources. He mentions J. R. Forster as describing the New Zealand dog as short and with a tufted tail, a very large head, small eyes, and pointed ears. George Forster, it will be recalled, writes of the Society islanders feeding pigs breadfruit paste (poe) called *mahei.* Smith refers to "Frederick Bennet" (*sic*) in connection with the poi dog but he has obviously drawn on more than Bennett's book, as we shall see.

Some of Smith's data may come from King's account, which likens the Hawaiian dog to the turnspit. Both Crozet and Captain Cook compare the New Zealand dogs with fox-dogs. Reverend William Ellis (1853, IV: 347) compares Hawaiian and Tahitian dogs with terriers. The Hawaiian dogs that Ellis saw in 1819 were "of rather a small size, and something like a terrier." Tahitian dogs were "usually of a small or middle size and appear a kind of terrier breed, but were by no means ferocious; and excepting their shape and habits, they have few of the characteristics of the English dog. This probably arises from their different food. . . ." Smith's description of the dog's tail as being straight or slightly curled is absent in earlier accounts. I cannot locate his source, but Hawaiian petroglyphs portray dogs with slightly curved tails (see Fig. 22). Another possible source Smith might have been familiar with is George Dixon's description (1789: 266) in September, 1787, of the Hawaiian dogs as appearing "to be of the cur kind, dull and heavy; they have sharp pointed ears projecting toward the nose." (See Figs. 13, 14, 15.)

F. D. Bennett, one of Smith's sources, was a fellow of the Royal College of Surgeons, who between 1833 and 1936 travelled around the world to study sperm whales. Although he really says very little about the dog from his own observations, he is one of the few scientists writing about Pacific dogs who has actually seen one, dead or alive, mixed or unmixed in breed. After mentioning the pig, he writes (1840, I: 86), "The aboriginal dog has also merged into a mongrel breed. The Tahitians formerly considered a dog, fed on vegetable food, a delicate dish; and although the impairment of the purity of the breed, and the prejudices of Europeans, have done much to abolish this state, it is still not unfrequently indulged." Although he gives no references, a phrase like "delicate dish" is reminiscent of the journals of the Cook expeditions. In a later description his comparing of dog meat with lamb and calling it a dish not to be despised recalls Cook's famous description of how to cook a Tahitian dog for the table. Later culinary adventurers often echo Cook's evaluation of the meat although Vancouver (1798, III: 61) varies it, after a meal with King Kamehameha I, by comparing the meat with mutton.

Bennett's list of the physical traits of the Hawaiian dog recalls, at least in part, King's description. Bennett writes (1840, I: 246):

> The indigenous and exotic quadrupeds resemble those at the Society group. The aboriginal, or poe dog, characterised by its small size, brown colour, foxy head, long back, crooked or bandy fore-legs, and sluggish disposition, is now a rare, and will probably be soon an extinct species—lost amidst a mongrel race of dogs partaking of every foreign variety. All classes of canines are favourites with the natives, who never kill them wantonly or treat them cruelly. They subsist,

like their owners, chiefly on vegetables. The aboriginal food is still considered a delicate food, even by the chiefs highest in rank and most civilised in their habits. Europeans who have sufficiently overcome their prejudice to indulge in this native luxury, assured me that the flesh of the poe dog, cooked in the primitive manner, bears close resemblance to lamb, and is consequently a dish that few who have tasted would despise.

In Honolulu, October, 1835, Bennett writes (1840, I: 216), "A hut, called by foreigners the 'native hotel,' has also been opened as an eating house for the same class of people; and here, it is not uncommon to see a skinned dog suspended invitingly at the door, to denote what dainties may be had within, in the same manner as a turtle or a haunch of venison is occasionally exhibited at *restaurateur* establishments in London."

Later while visiting Timor, Bennett writes (1840, II: 109) that the "swine, dogs, and domestic fowls found on all the Polynesian groups, and apparently coeval with man in their existence on those lands, betray much of an Asiatic origin."

L. J. Fitzinger, in his summary of the binomial classifications of the domesticated dogs of the world, includes Polynesian native dogs (1867: 382, 400–401, 499, 520, 528–529, 817). He distinguishes seven basic types of dogs in the world and puts the Polynesian dogs, which he divides into two breeds, with the pariah dog (*Canis domesticus indicus*). The two breeds, he states, derive through acclimatization in Polynesia of the Asiatic large pariah dog that ancestors of the Polynesians brought with them into the Pacific. This recalls the fact that in 1827 Peter Dillon (1829, I: 254) writes that in New Zealand "They have a breed of dogs peculiar to the island, and much resembling the Pariah dog of India and which is considered as furnishing a most delicate dish." Because Fitzinger (1867: 528) regards the pariah and the pomeranian as derived from the ancestral type of house dog and as sharing many resemblances, it is of interest that in 1793, more than 20 years after Cook had brought native dogs to Tongatabu, Labillardière (1800: 128) says that the dog there "is commonly of a fallow color, small and pretty near resembling the Pomeranian dog." Others, in later times, also liken the native dogs, especially in New Zealand, to pariah dogs and pomeranians (Thomson, 1922).

The following is Fitzinger's material relating to the Polynesian dog.

1. *Canis domesticus, indicus Novae-Zeelandiae.* Included are the New Zealand dog described by George Forster (1778, I: 165); *Canis familiaris villaticus, novae Zeelandiae* of Walther (1817: 23); *Canis otahitensis* of Reichenbach (1836: 46, figs. 573–575); *Canis familiaris orthotus* of Reichenbach ("Naturg. Raubth.," 141, figs. 573–575); the New Zealand dog of Smith (1845: 211, 296); *Canis australis* of Youatt (1846: 32–43; cited is only a German edition of Youatt, p. 26); and *Canis familiaris otahitensis* of Giebel (1859: 844).

Fitzinger (1867: 529) considers that this New Zealand dog, which he believes has obvious characteristics of the large pariah dog (*Canis domesticus, indicus*), undoubtedly is a variation of it. The slight differences in its bodily traits inevitably arose, he suggests, from its acclimatization in New Zealand on being brought from the Asiatic mainland and the East Indies. The differences are the smaller size, the blunter muzzle, and the more elongated body of the New Zealand dog as compared with the pariah dog. The color is mostly a solid rusty-red, black, or white, but also commonly spotted, the white ground color being covered with irregular black or rusty-red spots of various sizes, particularly on the cheeks around the eyes and ears.

2. *Canis domesticus, indicus taitiensis,* the Tahitian dog, found in the Hawaiian and Society islands, has only minor differences from the New Zealand dog, its closest relatives. Like it, Fitzinger states (1867: 529), acclimatization in Polynesia has led to slight variations from the ancestral large pariah dog. Of a smaller size than the New Zealand dog, the Tahitian dog resembles the crooked-legged dachshund (*C. vertagus*), Fitzinger continues, in its somewhat more elongated body and shorter legs, of which the forelegs are not completely straight but seem somewhat crooked. The color is solidly brownish or rusty-gold. This, to Fitzinger, is the dog described by George Forster for the Society Islands (1778, I: 286); *Canis familiaris villaticus, meridionalis* of Walther (1817: 23); Reichenbach's

(1836: 46) *Canis otahitensis;* his ("Naturg. Raubth.": 141) *Canis familiaris orthotus otahitensis; Canis Pacificus,* the "Poe dog" of the Pacific islands, of Smith (1845: 210, 296); and *Canis familiaris otahitensis* of Giebel (1859: 844).

THE POLYNESIAN DOGS AND THOSE OF MELANESIA AND NEW GUINEA

That Fitzinger (1867: 817) also has an extensive synonymy for two other Oceanic species besides the two breeds he distinguishes in Polynesia is a further reminder of the ramifications of the problems connected with the history of Polynesian dogs. Fitzinger classifies the dingo as *Canis Novae-Hollandiae* and the dog of New Guinea and New Ireland as *Canis Novae-Hiberniae.* The latter classification combines the New Guinea dogs described by Captain Forrest with those of New Ireland described by R. P. Lesson and P. Garnot. Fitzinger refers to both the dingo and the Melanesian dog as being half-tamed.

Pennant, who, it will be recalled, was familiar with Forrest's reference to the fox-looking dogs called Naf, considers New Guinea as a dispersal area of dogs—and much else—to Polynesia and perhaps to Australia. Lesson and Garnot (Duperrey, 1826, I: 123, 127, 132), who visited the same coastal area of Daru in Papua, New Guinea, report the same native name as Nafe. They describe the dogs of Australia, Papua, and the Melanesian islands of New Ireland, Buka, and Bougainville, as being so much alike as to belong perhaps to the same species. The New Ireland dog, which the natives call *poull* and eat, is small-bodied, with short hair that is either tawny or black, and with a pointed muzzle and short, erect ears. Courageous and carnivorous, it hunts on the reefs for its meal of fish and crabs. Writing specifically of the Australian dog, the scientists liken it to the *chien de berger* (see Fig. 17) as Forster did the New Zealand dog. Another account (Laurillard, 1849, III: 545), perhaps quoting from Lesson's later statements which I have not seen, varies slightly; for instance, the New Ireland dog is said to have spindly legs and to be smaller than the New Holland dog.

From other references to Melanesia and New Guinea dogs I shall select two or three provocative of comparisons with the Polynesian dogs, and hope to lure a zoologist to interpret the findings of other zoologists for which my one semester on the zoology of a worm and a frog did not prepare me.

Small black and white dogs are reported from the interior of British New Guinea and from Goodenough Island. A. S. Meek in 1896 found them "fairly numerous" in the latter island where, it was thought, no white man had been. Later, Sir Hubert Murray, governor of British New Guinea from 1907 to 1940, sent to Australia specimens of black and white dogs found around Mt. Scratchley. Presumably these are the same specimens that De Vis classified in 1911 as *Canis familiaris* Linnaeus (quoted from Le Soeuf and Burrell, 1923: 92, 93), and that Wood-Jones in 1929, without mentioning De Vis, studied as part of his series of projected papers comparing the domestic animals, particularly the dog, of Pacific islanders in the hope of shedding some light on the racial origins and racial movements of the people whom the animals accompanied. His study of the dingo has been mentioned; the Hawaiian study will be referred to later. Apparently, Wood-Jones never compared the measurements of dog crania from the three areas or continued with his project.

According to De Vis, the dog is black and white, with black predominant. The rather bushy tail reaches the middle of the lower leg. The dew-claw is absent. The neck is thick and short, the head comparatively small, and the muzzle deep and narrow. The eyes are slightly oblique, and the ears short and erect. The short hair is "closely adpressed, without under fur, longer on neck, forming ruff between shoulder and ear." Head and body measure 650 mm.; the height at the shoulder is 290 mm.

Wood-Jones (1929: 331), who gives a series of measurements, with two sketches, of the two crania (Nos. 3751 and 4083, Queensland Museum), concludes that the skulls are those of small dogs "of the terrier type, with fairly elongated sharp noses and well developed muscular crests and ridges." This Papuan breed, except for its "relatively large upper carnassial tooth typical of primitive canine breeds," dif-

fers "widely in its characters from the dogs of certain other Pacific islands" that are not named. The peculiarities are that the palate has a backward prolongation behind the last molar tooth; the supraorbital processes are pointed in form (the dingo's were "swollen," and appeared convex on the upper surface), "flat to concave on the upper surface, and singularly vulpine in character," and the sagittal crest "is formed by a coalescence of the temporal ridges in the region of the coronary suture in both specimens, and . . . is extremely prominent in its caudal extremity where it joins the well marked nuchal crest." Wood-Jones (1929: 331) quotes, perhaps from a letter from the museum director, a more detailed description of the colors of two skins that have apparently been preserved; one is black and white, with black dominant; the other is "Ridgway's russet. . . ."

Wood-Jones, it will be noted, finds something foxlike about this breed. This suggests that those early Europeans who called the native dogs of the Pacific "foxlike" were not influenced to do so by theories of the day that some breeds of dogs were derived from a fox ancestor.

The trail of the dog goes, of course, farther west than New Guinea. Interestingly, some writers on Indonesian dogs note oblique eyes among them or find traits that recall to them the dingo. Northward in Micronesia, where the dog was spottily distributed at the time of European discovery, there are many problems that also show that to learn more about the Polynesian dogs the entire South Pacific must be studied. In this paper I shall ignore Micronesia, however, and turn to the Hawaiian dog.

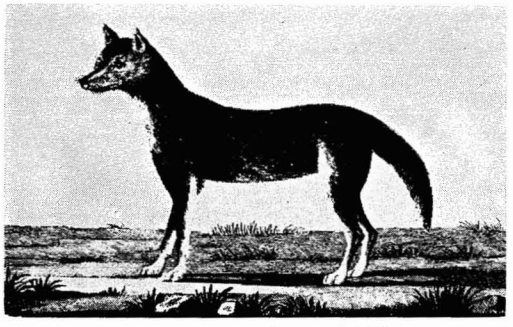

FIG. 21. An Australian dingo (Phillip, 1789 : pl. 45).

TWENTIETH-CENTURY STUDIES OF THE HAWAIIAN DOG

Few attempts to classify the Hawaiian dog have been made in the present century. Two zoological surveys (Sharp, 1913, I: 465; Bryan, 1915: 295) venture no description or classification. S. W. Tinker (1938: 84–87) gives no references but labels the dog *Canis domesticus hawaiiensis*. Like Bryan, he mentions the presence of color types distinguished by Hawaiians and probably follows David Malo (1951: 37) and references to dogs in native traditions and in Hawaiian-language newspapers. Tinker describes the colors as ranging from white through all of the yellowish and reddish shades to brown, with the lighter shades seemingly most numerous. The rest of Tinker's account seems to be derived from King and Wood-Jones. D. H. Johnson (1944: 334, 335), who does not describe but lists both the New Zealand and the Hawaiian dog as *Canis familiaris* Linnaeus, merely remarks that it was a domestic dog of Asiatic origin which Polynesians had purposely carried with them on their migrations.

Neither of the two major modern scientific studies of the physical traits of the Hawaiian dog gives any classification. However, they will be summarized because they point in the direction of our only hope now of learning more about the native dog.

Wood-Jones (1931) describes two crania of dogs believed to be possibly of the pre-European type, as they were obtained from Hawaiian archeological sites. Examination of the skulls reveals that although the cranial characteristics of the Hawaiian dog had greatly altered through a soft vegetable diet, the teeth had retained their primitive trait of large size. The relatively great length of the upper carnassial tooth is particularly noteworthy. This primitive trait recalls the New Guinea and Australian breeds. However, the Hawaiian canine skulls vary in many details from these western forms.

Wood-Jones writes, "The most conspicuous feature of the skull of the Hawaiian dog is the rounded and smooth contour of all parts of the cranium. The temporal lines are hardly visible; they are separated by an interval of nearly 30 mm. at the vertex, and the skull is therefore entirely devoid of a sagittal crest. The supra-

orbital processes are roundly convex and blunt. The muzzle is short and rounded, and the palate short and broad. The posterior margin of the palate is in line with the hinder portion of the last molar tooth." He gives in detail the cranial measurements of the two specimens. One, that of a young animal found in Nuololo Valley, Kauai, as a separate burial bundle in the general wrappings of a child, is in the Bishop Museum. Unstated is the present location of the second specimen, that of an adult dog from a burial cave at Nuololo Flat, Kauai. Both specimens were found wrapped in tapa.

Without citing a source, Wood-Jones also describes the appearance of the native Hawaiian dog. Probably he used Fitzinger, Ellis, King, and local Hawaiian informants for some of his account. The statement that one foreleg was commonly more bent than the other has not previously been recorded. Wood-Jones states:

> In general, however, we know that it was a long-bodied, short-legged dog of the short-haired terrier type. In general build it has been likened to the dachshund but, unlike this breed, its large ears were held erect. The tail was carried with an upward curve and the coat color appears to have been varied; but white and pale yellow are said to have been predominant. The fore limbs are described as being bandy, and it is said that very commonly one leg was markedly more bent than the other. Although the pure breed has ceased to exist in the islands of the Hawaiian group, there is abundant evidence of the persistence of its blood in the large number of long-bodied, short bandy-legged mongrels to be met with even around Honolulu. At times it would seem that the combination of characters, said by the old Hawaiians to be typical of the poi dog, is very faithfully reproduced in dogs of extremely mixed ancestry. It is by no means uncommon in Hawaiian villages to meet with these long, low dogs that have an unfamiliar appearance in consequence of their large erect ears.

The most recent study of the Hawaiian native dog, an examination of its teeth for caries, has been done by Dr. Arthur Svihla (1957), who is extending the study to visit museums in Polynesia to examine teeth thought to be derived from native dogs. The Hawaiian canine skulls and lower jaws that he examined came from archeological sites on Oahu and Hawaii. Skeletons of dogs are especially numerous in caves of refuge because women and children who sheltered in them took live pigs and dogs to provide part of their food. Dr. Svihla, who finds dental caries markedly prevalent in the teeth of these dogs, attributes the decay to the diet which was heavily weighted with starches and sugars. Food tabus, especially as relates to meat, had affected the women and the commoners who, although the caretakers of the pigs and dogs, were forbidden to eat them and fed them the staple vegetables of their own diet. Teeth of modern dog skulls in Bishop Museum have no caries, Dr. Svihla reports. He suggests that it is probably because the Hawaiian diet changed to include more protein after European contact and the abandonment of tabus. The diet of the dogs improved with that of their caretakers.

These studies by Wood-Jones and Svihla provide some support for the theories of the Forsters, King, Ellis, and others that the predominantly vegetable diet of the Polynesian dogs had caused some of the peculiarities of their appearance and behavior.

CONCLUSION

This paper has surveyed the literature on the taxonomy of the Polynesian native dogs. The source material of taxonomists has been derived, often at second- and third-hand, from impressionistic descriptions by members of the expeditions of Captain Cook and other eighteenth-century explorers, none of whom give a single measurement or apparently preserved a specimen for scientific study. Information from later centuries is open to doubt because interbreeding between native and introduced dogs began with the arrival of the first European ships with pet dogs aboard. No numerical data exist on the native dogs of the Society Islands and the Tuamotus. No measurements existed of Hawaiian native dogs until the twentieth century when, using archeological material presumed to be of pre-European age, Wood-Jones studied two crania and Svihla examined teeth for caries. No measurements were made on New Zealand dogs until the nineteenth century, by which time the identification of any living dogs as

representative of the pre-European variety was much disputed.

Four Polynesian archipelagoes—Hawaii, New Zealand, Society, and Tuamotus—had living native dogs at the time of European discovery. Archeological evidence from the Marquesas now shows that dogs had become extinct or very rare there by 1595, when Europeans are first known to have discovered the islands. Some islands, like Tonga, that had no dogs but recognized them, may also have had them once or heard about them from other islands.

Dogs are thought to have been brought to Polynesia by the first human discoverers and settlers of the area. The frequency with which early European artists showed dogs in canoes suggests that the dogs perhaps always made sure that they were not abandoned. Wood-Jones hoped through studying Pacific native dogs to learn something of their owners' migrations. One natural scientist favored New Guinea as a dispersal center of people and culture. Another who compared dogs of New Guinea and neighboring islands of Melanesia, not all of which had dogs, likened them to the Australian dingo. The dingo has also been compared with dogs to the westward in Indonesia and to the eastward in New Zealand. However, the fact that dogs of unknown breeds were introduced into New Zealand from Australia in the nineteenth century makes the question of dingo and Maori dog relationship difficult to answer without scientific measurements of ancient native forms. Although Polynesian dogs have been likened to many different mongrels and curs of the Old World, some natural scientists consider their closest kin to be among Asiatic pariah dogs. The place of Micronesian dogs in the Pacific scene remains to be considered.

The taxonomists, from their limited primary source material, feel that at least two breeds, which they do not define clearly, existed in Polynesia at the time of discovery by Europeans. The most distinctive of the superficial traits (the only kind described) was perhaps the length or quality of the hair. Some Maori and Tuamotuan dogs were especially valued for the long silky texture of their hair. Very early the natural scientists remarked on the possibility of adaptations resulting from the owners' care and exploitation of their animals for food or fur. Recent studies of native canine teeth show that the predominantly vegetable diet of pre-European Hawaiian dogs favored the development of caries. Latter-day concepts, like that of genetic drift, have not been considered in connection with the possible emergence of local varieties as the result of line breeding from perhaps a single pair isolated on an island. Study of Hawaiian canine skulls shows the persistence of the long upper carnassial tooth, a primitive trait, but the emergence of noticeable deviations in some characteristics of the skull as compared with Papuan and Australian forms.

To state the goals of those studying Pacific dogs makes these goals more specific than they are actually stated in most studies, but they underly the research of the past and remain for that of the future. The purposes have been: (1) to trace through the spread of domestic animals the wanderings of their owners as they dis-

FIG. 22. Petroglyphs that include dogs, Nuuanu Valley, Honolulu, Hawaii (Bishop Museum Negative 6809).

covered and settled the island world; (2) to classify Polynesian breeds of dogs in relationship to other dogs of the Pacific and of the world, and to determine the closest kin of the island dogs among the breeds elsewhere; and (3) to determine how the peculiarities of the Polynesian and other Pacific dogs originated through artificial and natural selection, mutation, genetic drift, and adaptations resulting from domestication and human use and care.

Now, more than 350 years after the first known European contact with Polynesia, progress toward these goals and toward learning more about *Canis familiaris* Linnaeus of pre-European Polynesia must depend upon studying museum skeletal remains and artifacts made of dog bones, teeth, and hair, and recent archaeological finds of remains of dogs that are datable by radiocarbon analysis as pre-European in age. Research like that of Wood-Jones and Svihla gives hope that even at this late date something may be learned of the characteristic of the Polynesian dogs and of the origin of local variations.

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