

The Extinction of the World's Languages

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traditional land tenure. Traditionally, no one could fish in an area where he did not have fishing rights, which are controlled by village chiefs. There were also laws against taking more fish than could be used, and laws allowing certain species to spawn for a day before catching them. In Hawai'i both the *aku* (ocean bonito) and *'ōpelu* (mackerel) were protected during spawning, with the open season on one covering the closed season on the other.

Some fish are now being threatened by extinction due to use of the handheld spear gun, which is not actually as efficient as a traditional net. What makes this technological change so devastating on Kapingamarangi is the way in which it is used. The elders do not control access to the spear gun; anyone who can afford to buy a gun can go out to fish. Outboard engines affixed to outrigger booms make access to any part of the lagoon or deep sea quick and easy. There are no longer any constraints on fishermen's activities other than bait, the weather, and the fuel supply.

Like indigenous peoples elsewhere, many Pacific islanders have abandoned their own traditional (and in many cases superior) technologies and methods of subsistence, for reasons we examine more fully in Chapter 7. Even Captain Cook commented of the native Hawaiian fish hooks he found in use that they were a "triumph of stone age technology . . . their strength and neatness are really astonishing; and in fact, we found them, upon trial, much superior to our own." Traditional fish hooks were fashioned in many different ways, often seemingly ineffective to outsiders, but their manufacture was based on centuries of knowledge of local fishing conditions.

In Tahiti, for instance, hooks for catching tuna were traditionally fashioned from numerous varieties of pearl shell, with each shell distinctive to a particular stretch of coast of an island. A good fisherman would know the names of every kind of shell from every district of every island. In particular, the use of hooks with a strongly inward-curving (rather than straight) point, or hooks without barbs, are more efficient for catching many varieties of fish than imported metal fish hooks which have to be purchased with cash. The advantage of modern western hooks now used by many Pacific fishermen lies, like that of the spear gun, in their availability, providing one has the cash to buy them.

Figure 3.5 shows some of the so-called rotating hooks with inward facing points used on Tobi (one of the smallest, most isolated of the inhabited Micronesian islands, lying 200 to 300 miles southwest of Palau). This kind of hook is used under conditions where it is difficult to set the hook by jerking the line sharply when a fish bites: for example, when dropline fishing in deep water or in strong currents.

Traditional fishermen, particularly on small islands where the people still depend on the sea for most of their food, are still rich sources of information unknown to western scientists. Centuries before biologists existed, Palauans

Metch

- The name is derived from the Tobian name for cone shells, and refers to the spiral groove on the crown of the shell; the lower shank, bend, and point form a spiral.
- Strongly curved point facing inward (shallower water version) or downward (deeper water version).
- Used with a weight in dropline fishing for large-mouthed fish such as grouper. This is the hook of choice when fishing very deep.
- The fish must be allowed to run with the hook and then retrieved while keeping steady moderate tension on the line.

Fahum

- Bend almost circular.
- A deep water dropline hook used for fish with smaller mouths (e.g. lethrinids) than those sought with a metch.
- As many as five may be baited and attached to a single line at intervals.
- Used without a weight (a rock is tied loosely to the line to take the hook down, then shaken loose with a jerk).
- The hooking technique is intermediate between that used for a conventional rotating hook and a jabbing hook. The fish is played gently for a while until the hook sets itself lightly. Then the line is jerked hard to set the hook more firmly.

Ramatiho

- Similar in shape to fahum, but point does not approach the shank so closely and the shank has more inward curvature.
- Used for dropline fishing in fairly deep water.
- The bait is placed on the hook loosely to allow maximum penetration; when a fish bites the bait usually slides up the shank.
- Used for groupers and also for fish that suck the bait in and out of their mouths cautiously; the wide bend makes the hook hard to spit out.
- Always hooks in the jaws, not in the lips; good for fish with easily torn lips.
- A strong fish is liable to bend this hook and escape.

Figure 3.5 Some traditional fish hooks used on Tobi, Palau

[Reprinted from R.E. Johannes, Words of the Lagoon. Fishing and Marine Lore in the Palau District of Micronesia. Berkeley: University of California Press, 1981, pp. 196-97]

knew that certain types of vibrations could be used to attract sharks. Sea cucumbers, for instance, have been traditionally used in Oceania as a fish poison, but biologists established their toxicity only in the 1950s. Palauans have a remedy for the venomous sting of the rabbitfish, which could be of more general pharmacological use. They rub the raw internal organs (or sometimes just the gallbladder) of the fish on the wound and the pain subsides in a few minutes. The fact that the sting never causes pain if a person is attacked only once suggests that the reaction is of an immunological nature.

Local fishing techniques relied on the fishermen's intimate knowledge of anatomy, behavior, and habitat of many different species. The average reader of this book will hardly be conscious of the many phases of the moon and their relation to the timing of the tides, but to the Palauan fisherman, they provided information about the location of different fish and their vulnerability to capture. Throughout Oceania seasonal environmental changes are charted in a calendar based on the lunar month. The names given to certain days of the lunar month on various Pacific islands foretell the likelihood of successful fishing. On Namoluk Atoll in the Caroline Islands, the night before the new moon is called *Otolol*, which means "to swarm." In Kiribati (formerly the Gilbert Islands) the name of the day after the new moon means the same thing. The Trukese name for the night of the full moon is *bonung aro*, meaning "night of laying eggs." In Hawai'i and Tahiti there were two sets of nights with names containing 'olel'ore, one beginning on the seventh night in the ascending moon, and another beginning on the twenty-first in the descending moon. These times during which the 'Olel'Ore wind prevailed (in what we call the first and third quarters of the moon) were the periods of greatest scarcity. In Hawai'i these nights were considered 'unlucky' for fishing as well as planting because 'ole also means "nothing."

All these names indicate that good fishing days tend to cluster around the new moon. Only a few cases of lunar spawning cycles are recorded in the western scientific literature, but islanders were familiar with these rhythms. Furthermore, our own western calendar obscures this pattern of environmental rhythms. Although marine organisms whose spawning patterns are tied to a lunar cycle lay their eggs during the same portion of the lunar month year after year, their spawning dates vary, apparently, by up to a month or more without any reason within the western calendar. A lunar month averages 29.5 days, so 12 lunar months add up to only 354 days, or 11 days short of a solar year. The need to keep the lunar calendar in synchrony with the seasons meant that an extra month had to be inserted every so often. Palauans did this automatically and unconsciously. For them the New Year starts only when the stars and moon are "right," no matter how many lunar months have passed since the last New Year. Learning and committing to memory the timing and location of the spawnings of various species was part of the fisherman's training.

The tides are also timed in relation to lunar phases, and these too were committed to memory. Most of the languages and dialects have specific terms for the paired currents which form on either side of the islands, a region in which these currents converge downstream, and a back current flowing toward the island from this convergence point. The islanders were using their knowledge of current patterns in both fishing and navigation long before they were documented by oceanographers.

While Western scientific taxonomies attend more to formal similarities, native taxonomies may reflect functional concerns. Some species of fish in Tobi have been given a kind of generic name, based on the type of hook used to catch them. The term *bwerre*, for instance, given to certain groupers, refers to the multihooked dropline method of catching them. Other Tobian fish names often refer to behavioral characteristics, such as *hari*, "to bite," the name for brightly colored groupers. One of these groupers is called *hari merong*, which means "always bites, takes any bait." Another set of groupers is called *haugus*, which means "vacuum" and refers to the ability of these large groupers to inhale their prey by means of the sudden expansion of their oral cavities. The term *moghu* refers to a common illness on Tobi accompanied by chancre sores and fever, and is also the name given to the surgeon fish used in its treatment. The fish is ground up without removing its internal organs and then eaten. Hawaiians also gave names to fish according to some prominent characteristic or color. The *humuhumu 'ele'ele* is the "black trigger fish" while the *humuhumu nukunukuapua'a* refers to a "trigger fish with nose like a pig" and *humuhumu umaumalei* means "trigger fish with a lei (flower garland) on its chest." One group of fish called *a'u*, meaning "to prod," included all fish with long sharp beaks such as sailfish, marlin, swordfish, and garfish. To fishermen the strong beak of these fish was of most importance because a swordfish could pierce a canoe.

Important species relied heavily upon for food such as *aku* (ocean bonito), *manini* (surgeon fish), and *'ama'ama* (mullett) have more than one name, depending on the stage the fish has reached in its life cycle (see Figure 3.6). The names may refer to different habitats, behavioral patterns, characteristic colors, or to different fishing techniques used in catching them. The mullett, for instance, is usually referred to as *'ama'ama* when it is finger-length and most delicious, rather than as *'anae*, the name given to the adult fish a foot or more in length. Because fish spawn are very similar in appearance across species, a single term was sometimes used to indicate them. Thus, the term *kina'u* was applied to the spawn of both the *kawakawa* (bonito or little tunny) and *aku*, which are found together and indistinguishable until they mature. The young stage of both was called *'āhua* or *'ōhua*. As the *manini* (surgeon fish) increases in age and size, it is called *'ōhua liko* ("young leaf bud") when in its transparent stage, *'ōhua kāni'o* ("striped") when stripes

emerge after about a day, *'ōhua pala pōhaku* or *'ōhua hā'eka'eka* (“dirty/smudged”) when it begins to nibble at the *pala pōhaku* seaweed and its skin darkens, *kākala manini* (“caudal spine,” the knifelike cartilage near the end of tail) when it is half-grown, and finally *manini*.

Our examples have shown that language is part of a complex ecology that must be supported if biodiversity is to be maintained. Despite the existence of a vast amount of largely undocumented scientific knowledge in the world's indigenous languages, what goes by the name of modern science is still based largely on the worldview of Europeans and their languages, especially English. As we will show in more detail in Chapter 7, most scientific research is still done by scientists from the world's industrialized countries who are interested primarily in “First World” problems. This is not because western science and languages are particularly well suited to technology. Indeed, our examples of the naming of fish and fishing practices in the Pacific islands show how native perceptions and detailed knowledge of the environment have been encoded in patterns of naming of fish, fish behaviors, fishing practices, and technology. When these words are lost, it becomes increasingly difficult even to frame problems and solve them in any but the dominant culture's terms and scientific classification schemes, which are not always adequate to the task. Moreover, as we will see in Chapters 5 and 6, it was largely due to accident rather than to any inherent superiority that dominant economic, technological, and cultural power developed in that part of the world where European languages were spoken. Before considering those processes, however, we ask a simpler question: Where has all this diversity come from?