The crushed kernels of this plant (Cerbera) are used to poison fish.

Barringtonia: another species whose toxic kernels provide a fish poison.

Fishing Poisons Of The South Pacific

At the First South Pacific Conference (April, 1950) the representatives of the island peoples expressed concern that in some parts of the South Pacific, fishing methods included the use of poisons and of explosives, and recorded the view that, wherever possible, these practices should be prohibited. The Commission endorsed this resolution and commended it to the attention of the governments concerned.

By JACQUES BARRAU*

AMONGST the many methods devised by South Pacific islanders for catching fish, the use of poison plants deserves mention. (Of course, these poisons can be effective only in ponds and streams or in the pools left at low tide on some reefs.) The method is practised almost everywhere in the islands, more particularly perhaps in the Western Pacific, although Polynesians also use, or used, it rather frequently.

Most of the naturalists who visited Polynesia in the course of the last century described a number of plants traditionally used for poisoning fish.

Moerenhout[1] mentioned the use of *Tephrosia, Cerbera* and *Barringtonia* in connection with fishing in the islands now known as French Oceania. These plants are found in most Polynesian islands, together with a few others such as *Diospyros samoensis,* whose fruits are used by Niue fishermen.

The number of fishing poisons is probably larger, and their employment more common, in the islands of the Western Pacific. Gatty[2] in the excellent study he recently made of this matter, mentions, in Fiji, *Pittosporum, Barringtonia, Tephrosia, Derris* and *Euphorbia.*

In New Caledonia, *Derris, Cerbera* and *Euphorbia* are commonly used, as well as *Excoecaria agallocha* and *Entada* sp., probably *gigas.* Virot[3], in his study of fishing poisons in this territory, was surprised to find that the natives did not use *Derris uliginosa,* a plant commonly found in the island. He was mistaken, as local fishermen of the east coast commonly use it.

Most of the above-mentioned plants grow wild. However, in Fiji, New Caledonia and the Loyalty Islands some *Euphorbia* are cultivated for fish poison. Thus, the species described from New Caledonia and the Loyalty Islands under the name *Euphorbia kanalensis* is only found in the cultivated state, propagated by cuttings, and can be observed in most gardens. Similarly, in New Guinea, some species of *Derris* are commonly cultivated in the gardens.

The toxic agent varies according to the plant used. In Leguminosae such as the various *Derris* and *Tephrosia* it seems that the active principle is a Methoxylactone (Rotenone in *Derris,* Tephrosin in *Tephrosia*). Among the Apocynaceae, the toxic effect might be produced by Glucosides (Cerberine of the *Cerbera*) as appears also to be the case for the Euphorbiaceae and *Excoecaria agallocha.* As for the *Barringtonia,* the toxicity of the kernel, which is the part used in fishing, seems to be due to the presence of a Saponine.

Vegetable fishing poisons are used in different ways. In some species, the roots are used (*Derris*); in others, the kernels (*Cerbera, Barringtonia*) or the stems and leaves (*Euphorbia*). In New Caledonia, the natives prepare bundles of leafy branches of *Euphorbia kanalensis,* first pounding them roughly, and throw them in the pool to be poisoned. In rivers, these bundles are sometimes

1 Moerenhout, **Voyages aux Iles du Grand Ocean.** Paris, 1837.

2 Gatty, **Use of Fish Poison Plants in the Pacific.** Proceedings of the Fiji Society of Science and Industry. Suva, 1943.

3 Virot, **Les plantes ichtyotoxiques de la Nouvelle Caledonie.** Revue Internationale de Botanique appliquee et d'Agriculture tropicale— No. 327-328. Paris, 1950.

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Derris growing in a coastal village in the Morobe District, Netherlands New Guinea. Poison diffused from crushed roots of this plant thrown into water stuns fish, which can then be easily collected.

placed upstream of some rough contraptions of rocks and branches, against which the fish, stunned by the poison diffused in running water, are collected.

The poison plants are sometimes cooked before use (*Pittosporum, Entada*), while the toxic kernels of *Barringtonia* and *Cerbera* are crushed or grated before throwing them in the water.

* * *

The use of fishing poisons is now prohibited in many South Pacific territories. Sometimes, in view of the moderate use made of them by the natives, administrations have felt it was preferable not to ban these traditional techniques; this is the case in Papua and New Guinea, and in the British Solomon Islands.

It should indeed be acknowledged that, in most cases, the islanders knew enough to exercise moderation in the use of fishing poisons. When these were used strictly in the context of a subsistence economy, it is highly probable that the practice of this fishing technique never represented a serious threat to the resources of streams and reefs.

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The Productivity Of Fish Ponds

THERE has been in recent years a growing interest in the establishment of fish ponds in tropical Asia and Africa. In the South Pacific also there is already some interest in the possibilities of fish farming in ponds.

In many places where sea fish are not available—or available during part of the year only—the fish pond could provide an excellent addition of high-value protein food to the diet.

A remarkable feature of fish farming is its high productivity per acre. Although the expression of 'fish production per acre' is a normal practice, it is not quite correct as fish are not reared on a surface but in a certain volume of water.

One can stock more fish in a pond of a depth of 3 ft. than in a pond of 6 ins. For best results a depth of around 3 ft. seems desirable.

In Africa production rates of up to 5,000 kg./ha. (4,500 lb./acre) have been obtained from farming *Tilapia* species in fish ponds under very favourable conditions. While this may be regarded as an unusually high maximum, yields of up to 4,000 kg./ha. (3,500 lb./acre) have been recorded in various tropical countries. This is eight times as much as the maximum yield in Western Europe, where 500 kg./ha. (450 lb./acre) can be obtained only with carp in fish ponds under the best conditions.

It might be of interest to compare these figures with the production figures of another source of animal protein—the productivity of beef cattle.

In Western Europe the productivity of beef cattle is of the same order as the productivity of fish. Productions of 500 kg./ha. (450 lb./acre) dressed beef can be obtained under excellent conditions. However, in a hot, humid tropical climate beef production is very much lower. Some authorities give a figure of 50 kg./ha. (45 lb./acre) as being good.

Whereas long-term basic research will be necessary to solve the problems in grassland and cattle improvement in the tropics, fish culture in ponds can be introduced immediately with fair chances of good results.

Preservation of Fish

Letter To The Editor

The following passage concerning the preservation of fish is taken from a letter recently received from Monsieur Jacques de Préville, of Vila, New Hebrides:

"In the last *Quarterly Bulletin* I received (January) I read with interest your article on fish preservation. It reminds me of a discovery I made quite by chance. After a miraculous catch of large mullet I distributed fish enough for two days to my employees and salted the remainder, intending to put it out to dry in the sun.

"After two days the rain began to fall and seemed likely to continue for some time; I therefore had the fish hung up under the roof of the copra 'smoke' which was operating permanently at the time and left it there just as it was. After a fortnight or a month I decided to taste it and was surprised to find that it had a smoked flavour as good as, if not better than, that of good quality cod found on the market.

"There could be no simpler method of processing fish for many planters, to whom this might be of interest."

Papua and New Guinea Medical Journal

"The Papua and New Guinea Medical Journal has been established as an instrument of the Department of Public Health of the Territory of Papua and New Guinea and is to be published quarterly," writes Dr. J. T. Gunther, Director, Department of Public Health, Territory of Papua and New Guinea, in the foreword to the first issue (dated May, 1955). "Results of research carried out by medical personnel into the particular problems of the Territory have been published outside the Territory, and advances in the prevention and treatment of local diseases have been spread by these external journals and departmental circulars."

"The *Journal,*" says Dr. Gunther, "is intended to keep our varied grades of medical personnel abreast of world progress in the prevention and treatment of the disease pattern of the Territory, to promote medical research locally into these diseases and to facilitate an exchange of ideas between officers who are otherwise geographically isolated."

The *Quarterly Bulletin* welcomes this new periodical in the Pacific and wishes it every success.

(All communications should be addressed to the Editor, *Papua and New Guinea Medical Journal,* Department of Public Health, Port Moresby, Papua and New Guinea.—Editor.)