

# XI Cultigens and Useful Plants, Domesticated and Hunted Animals

The natives of the Bismarck Archipelago and the German Solomon Islands are certainly not exclusively vegetarian, yet the plant kingdom provides them with the greater part of their nutritional needs, and since they have a particular name for each plant, they obviously make the most extensive use of the products of the plant kingdom.

They put the Europeans to shame by their knowledge of plants. They can, with the greatest confidence, name several hundred plant species, and distinguish numerous varieties. Thus the inhabitants of the north-eastern Gazelle Peninsula, for example, know over seventy various species of banana, although the distinguishing characteristics are so subtle that even an experienced botanist would have to be very attentive before he would be able to recognise them.

It is true that many of the products of the plant kingdom virtually grow into the mouths of the natives. However, as a rule, he must also, like everywhere else in the world, obtain his daily bread by the sweat of his brow, although a benevolent nature takes care that his exertions in this direction are extremely tolerable. Many of the principal food plants require regular cultivation and careful tending, which the gardener carries out almost continuously, from setting out his plot right until harvest, while other plants yield an abundant harvest from year to year without special exertion.

The following can be designated as the main food sources: taro and yam tubers, *batatas* or sweet potatoes, bananas and breadfruit, as well as coconuts where they exist, and numerous other fruits, root crops, and vegetables as well.

Taro and yam require careful preparation of the soil. In the forest regions the undergrowth and medium-sized trees are felled and burned; very large forest giants are burned round their trunks, so that they lose their foliage and cast only small shadows; then the ground is cleared and all weeds and roots, and so on, are removed and burned on the spot. If the ground is stony, the stones are removed and piled up at the edge of the plot. In grasslands, the soil is deeply dug so that the grass

roots can be removed. Where white settlers are established, the native today often uses iron spades where earlier a stick was used exclusively. This was about 2 metres long, 6 to 8 centimetres wide, somewhat tapered at one end and usually carved from the outer hard wood of a species of palm. In using it, with the tapered end they dig a number of deep holes around the clod to be removed, then finally dig the stick in deeply, and use this lever to break the clod completely free and turn it over. To lighten the work they often choose the side of a hill as the garden site, and begin breaking up the soil from below; repeated cultivation of such surfaces finally creates a vertical wall 2 metres tall, often more, at the upper edge. When the plot is broken up, individual clods are smashed, grass roots are gathered and flung far behind them. These then dry in the sun before being gathered up and burned.

Very rarely does the native plant the same crop in his plot for two or more consecutive years. One crop is the rule; the plot is then abandoned or another type of food crop is planted – one requiring less work and using up the soil to a lesser degree: for the most part bananas. Banana trees frequently bear throughout the year, especially when the plot is weeded from time to time. In the end the *alang-alang* grass overgrows the bananas, and the garden becomes grassland once more. The abandoned gardens lie fallow for years, until their fertility is called upon again.

Such a system of agriculture obviously requires extensive stretches of land to provide a relatively small population with food, but for the present there is no lack of ground and soil, besides which the native thinks nothing of it, if his garden is often 5 to 10 kilometres from his village. In such a case he builds a hut in his garden to provide him with shelter while working there.

In establishing their plots, caring for the cultivated plants and weeding the soil, the natives can certainly set an example to more advanced peoples.

Taro (*Colocasia antiquorum*, var. *esculenta*) occurs in two varieties, swamp and mountain taro, or more





accurately taro that requires swampy or very damp soil in order to thrive, and taro that grows in less damp soil, on slopes and high plateaux. The strains are very numerous on the various islands. On the low coral islands the taro plant grows poorly, and it requires laboriously established plant nurseries, set deeply into the coral soil with an artificially produced humus layer in order to grow the desired tubers (see page 235).

The taro seedlings consist of the thin upper segments of the tubers or central stick with the adhering leaf stalks. These are placed in small holes 20 centimetres deep and about 50 to 75 centimetres apart. Making plant holes requires skill and practice; they use a sharpened planting stick, about a metre long. It is pushed into the ground and moved in all directions in a circle, partly to enlarge the hole upwards, and partly to compact the soil of the side walls. The seedlings are then gently pressed firmly into the bottom of the conical holes, which are not filled in but left open. During the first two months of growth, any earth or other rubbish that has fallen into the hole is removed from time to time. After about three months, all the leaf shoots, except one or two central ones, are broken off and from then on the plant requires no further care than weeding the garden and possibly a light breaking up of the soil.

After six or seven months the taro tubers are fully grown and can be harvested. With careful tending in good soil individual tubers can weigh 5 to 6 kilograms.

Planting season varies. In parts of the Gazelle Peninsula where the soil is inferior and where there are alternating periods of pronounced low rainfall and high rainfall, planting is carried out at the onset of the wet season. On Bougainville and on New Ireland where rainfall is fairly evenly spread throughout the year, and the soil is not so porous, planting is year-round.

Taro tubers have a significant nutritional value and stand above all other vegetables. An analysis of dry sections of taro from New Britain, reported in Volume II of *Tropenpflanzer*, yielded the following composition:

water	11.59 per cent
ash	2.33 per cent
fat	0.28 per cent
starch	56.988 per cent
nitrogenous material	2.85 per cent

Furthermore, both the tubers and the leaves of the taro plant have poisonous properties, which only disappear on roasting or boiling. The tubers are roasted over hot coals or baked between glowing stones; in areas where cooking pots are used – for example, on the Solomon and Admiralty islands – sliced tubers are also cooked in water. Grated or crushed taro tubers mixed with grated

coconut are shaped into cakes, wrapped in leaves and baked between hot stones. Taro tubers are tasty and Europeans easily get used to them; in many areas taro totally replace potatoes.

Related to the taro plants are several species of *Alocasia* which are found growing wild everywhere. They are perennial plants whose leaves are frequently over a metre long and often having a central stem weighing 25 kilograms. However, because of its bitter taste and woody fibres, it is used only in times of necessity. On the low coral islands, like Nukumanu, Tauu and Nuguria, the varieties of *Alocasia* are cultivated to a greater extent, because they prefer poorer soil.

Yams (*Dioscorea*), like taro, require careful working of the soil, but do not tolerate very damp or swampy soil. Yam tubers take second place after taro as a food source, but are neither cultivated so much nor so widely enjoyed, probably because their nutritional value is low. The yam plant, of which there are as many cultivated varieties as wild species and varieties on all the higher islands, is a vine requiring a stick for support. A section of tuber with one or more eyes is placed in a hole in the dug-over soil, and the earth is heaped over it a little. Better results are obtained when the ground is deeply dug over, the earth heaped up and the seed tubers placed in the loose top of the heap. With good soil, and using the latter method, tubers weighing 30 kilograms are obtainable. The yam tubers are ripe after about six months, recognisable from the tops dying off. Yam tubers have an advantage over taro in that they can be stored for several months after harvest, whereas taro rots five to six days after harvest. Preparation for eating is the same as I have described for the taro tubers.

The numerous wild species of *Dioscorea* are eaten only when crops have failed; however, there are also wild species that are not unpalatable to the European taste and are often preferred to the cultivated species.

A tuber that in places is cultivated fairly widely, for example, in the north of New Ireland, is the *batata* or sweet potato (*Convolvulus batatas*). It is cultivated like the yam and prefers a leaner soil. A variety with white tubers and one with red tubers are most often encountered. For propagation it is sufficient to stick several twigs of the green top into the soil. The *batata* has little food value, and has a sweetish taste appealing to few Europeans.

Years ago the cassava or tapioca plant, *Jatropha manihot*, was introduced to the Gazelle Peninsula by settlers, and spread rapidly. Now fairly large gardens of it are found almost everywhere, and the floury tubers, roasted over charcoal are a popular food. That the plant has spread so quickly, is because it requires very little care, can be propagated in the simplest way by cutting off a stalk, and because with its thick foliage it covers the soil to such an extent that weeds do not become a problem.





Another food plant of great importance is the banana. It is found both in shore regions and on high mountains, in both rich and poorer soil, and, at any time of the year, in the banana plantations, giant bundles of fruit can be found in all stages of development. Cultivation is simple: a sucker is broken off the main root so that part of the root remains attached, and the rootlet is planted in a chosen spot. In the first four to six months, a banana plantation is occasionally weeded; after this the tree has developed so many leaves that the ground is shaded and weeds cannot grow so quickly. For about five to six years a plantation looks after itself with little care, and yields a large quantity of fruit during this time. The growing stem bears only once; after harvest of the bundle of fruit the subsequently barren stem is cut down, to avoid its hindering development of the sucker. In order to obtain large bundles of fruit, most of the suckers are destroyed while juvenile, and only two or three are allowed to grow. If the young shoots are not destroyed, then after two or three years in good soil a banana tree slowly forms a circle 3 to 4 metres in diameter, stem crammed against stem, but only bearing small bundles of fruit. Varieties are extremely numerous: I have already mentioned how many there are on the Gazelle Peninsula, the same goes for other islands. In several varieties the bundles of fruit reach an astonishing size; bundles of 60 kilograms are not infrequent in fertile soil. The ripe fruit of the individual varieties differ significantly from one another in form, size, taste and aroma. Bananas are eaten either in a fully ripened state, when they contain a lot of sugar, or they are roasted or boiled, and then contain more starch; the natives prefer the bananas in the latter form, because of their greater nutritional value.

The tree stem produces an excellent long, strong fibre, collected in many places for making strong cords and rope.

The leaves have many uses as well: a roof can rapidly be made from them for protection against rain or sunburn; they provide wrapping for food baked between stones; head coverings and loincloths are easily made from them, and they take the place of plates and bowls for serving food.

The coconut palm requires less care than the cultivation of the abovementioned food plants. The use of this very important tree has become almost proverbial among the South Sea islanders. However, there are many inhabitants of the Bismarck Archipelago and Solomon Islands who exist without coconuts, for the coconut palm thrives only on the shore regions and as far inland as the salt-laden onshore breeze is effective. Thus the inland inhabitants have no coconut palms. However, there are extensively inhabited stretches of shore where, in spite of quite a dense population, there are only small stands of coconut. As modest as the

palm may be in terms of its needs, nevertheless in order to thrive its main requirements are air and light, particularly in the juvenile stage. Wherever the natives are too lazy to plant coconuts in abandoned taro or yam gardens, only small stands exist.

People often attempt to explain the wide dispersal of the coconut palm by the ripe nut falling into the sea, as may well happen occasionally, and, surrounded in a light fibrous material, floating on the water and being carried by currents from one island to another. The untenability of this theory becomes immediately clear to anyone who has travelled among the many islands populated by coconut palms. I cannot recall, in the course of my numerous voyages from one South Sea island to another (journeys that covered many thousands of miles) one single instance of a coconut ever coming into view carried on the sea, although, on reflection, this is not outside the realms of possibility, and nuts that have fallen into the water could reach other islands if the distance were only small. Sea captains who, over many years, have traversed these regions in all directions, do not remember any such instances either, even though their eyes scanned the surface of the sea from morning until late, and were used to detecting even the smallest object. Besides, there are many hundreds of miles of flat stretches of shore that are completely bereft of coconut palms, and it is not evident why coconuts, carried by the sea, should have avoided these stretches from time immemorial, to be cast ashore somewhere else in great numbers, when the current throws everything else ashore in these places. Again, there are islands which in their hilly, and in places mountainous, centre have good stands of coconut, but not a single palm on the beach. If one undertakes an investigation on the flotation ability of ripe coconuts, one finds that after a few days the fibrous covering has soaked up sea water like a sponge, so that the nut settles deeper, gradually losing all ability to float, and sinks to the bottom of the sea. Where coconut palms exist, they were probably always planted by human hand; and even where, today, uninhabited islands are found with large stands of coconuts, this is only an indication that the island was once inhabited, and became divested of humans for whatever reason. The legends of many islanders allude directly to the coconut being introduced by people who were, with the passing of time, venerated by those coming after as gods and legendary beings.

The great significance of the coconut palm for the natives lies in it, more than any other cultivated plant of the South Sea islands, being the basis for export trade, and thereby a foundation for development of the natives. It offers them the means, by way of the trade route, of satisfying those needs that constantly progressing culture tells them about and allows them to absorb.





It seems almost superfluous to report extensively on the uses of the coconut palm: accordingly it can be done in all brevity. The unripe nut yields 0.5 to 1 litre of a clear fluid, known as coconut milk, although it bears no resemblance to milk. This liquid makes a pleasant refreshing drink. The milk of the mature nut is less tasty. The frail gelatinous kernel of the unripe nut is a favourite delicacy everywhere. The hard ripe kernel serves as a foodstuff when fresh, or as an ingredient to dishes, in which case it is as a rule first grated. Cut up and dried, the coconut kernels form the export product copra, until now the principal export of the colony. The growing nut fills on the inside with a spongy white substance that is regarded by young and old as a delicacy. All natives know how to prepare the oil, although this is not customary everywhere; great quantities of oil are prepared in the Admiralty Islands and stored in huge containers to serve as a food additive when required. The hard nut shells are used as water, oil, and lime containers. Pieces of shell serve as drinking vessels, scrapers, spoons and armrings; on the Tasman Islands they make small discs, 6 to 7 millimetres in diameter, out of the shell, bore them through the middle and thread them on strings, alternating with white seashell discs. These serve as money.

The fibrous outer shell of the nut is separated from the woody part by hitting with a wooden maul. The fibre obtained is used for making yarn and cordage. Thousands of tons of this material are lost every year because the natives are too lazy to collect it. Pieces of the fibrous shell are used as paint brushes, and, with this primitive instrument, the native paints his carvings, masks, god images, house gables, and so on, with the finest decoration. On long journeys by land and sea the dried shell serves as tinder.

Baskets are woven from the leaves, and mats for various purposes. Almost everywhere that coconuts are grown, coconut palm leaves woven together serve as a roofing material; from the fine leaf ribs they make brooms, fish-traps and other kinds of trap. When night-fishing on the coral reef, dried leaves tied together serve as torches, whose glow attracts the fish. Immature centre leaves make a splendid vegetable, similar to cauliflower.

The wood of the coconut palm is very long-lasting, especially when it is kept away from dampness. It is used as posts and lathes in building, or as raw material for making clubs and spears.

In many districts, the flower cases are wrapped firmly and cut off before the flowers have developed; from the wound flows a sweet sap that is uncommonly nutritious, and on which suckling infants can be raised. After a short time this sap ferments, and becomes an intoxicating drink.

Of no small importance to the inhabitants of the various islands is the breadfruit tree (*Artocarpus*):

twice a year it yields a great number of fruit whose flesh, roasted like seed kernels on a charcoal fire, provides a tasty meal. The breadfruit tree grows in a semi-wild state, and in places forms large stands whose shiny dark-green foliage gives an unique character to the vegetation. The trees grow as much as 20 metres high with a trunk up to 1 metre in diameter. The almost horizontal branches form a giant conical crown. The number of varieties is considerable, and the size of the fruit ranges from 2 to 4 kilograms. The shape of the fruit varies from spherical to a lengthy ellipse. In the Bismarck Archipelago and in the Solomon Islands are only the varieties with numerous seed grains the size of a chestnut imbedded in the flesh of the fruit.

The wood is soft, light and pale brown, and is used occasionally for canoe building. Cuts in the bark give a rich, milky-white sticky sap, which hardens rapidly and is used for caulking containers and canoes.

The cultivated plants previously mentioned provide the principal food resources of the natives. Besides these, however, the forest offers a great number of fruits of all kinds, with which the natives are familiar, and which form a supplement and give variety to the daily diet. Thus *Inocarpus edulis* provides numerous fruits that resemble our chestnuts when roasted. *Terminalia catappa* and species of *Canarium* provide nut kernels with a splendid flavour. *Spondias dulcis*, *Pometia pinnata*, *Carica papaya*, *Eugenia malaccensis*, various species of pandanus, and indigenous forms of mango provide juicy, tasty fruit that are not spurned by habituated whites either.

The sago palm also is of great importance in several places; for example, in the north of New Ireland and the west of New Britain. On Buka and Bougainville they obtain a flour very similar to sago from the pulp of the *Cycas* stem.

Several excellent varieties of sugar cane are found in almost all the natives' gardens as auxiliary produce, and likewise various plants whose leaves are prepared as vegetables, and appear also on the settlers' tables as spinach.

The shore-dwellers eat various species of seaweed, both raw and cooked.

Overall, there is no fruit that would not be more or less edible to a hungry native.

On all the islands apart from several low coral islands, they eat various varieties of the nut of the *Areca* palm as a stimulant, and in this connection they also eat the fruit and leaves of *Piper betle* together with unburned coral lime. Tobacco appears to have been known for a very long time by the natives of several places – for example, Buka – where they grow and process the special, not very fragrant, plant.

Native cooking is therefore richly garnished with vegetables, more so than the table of a European





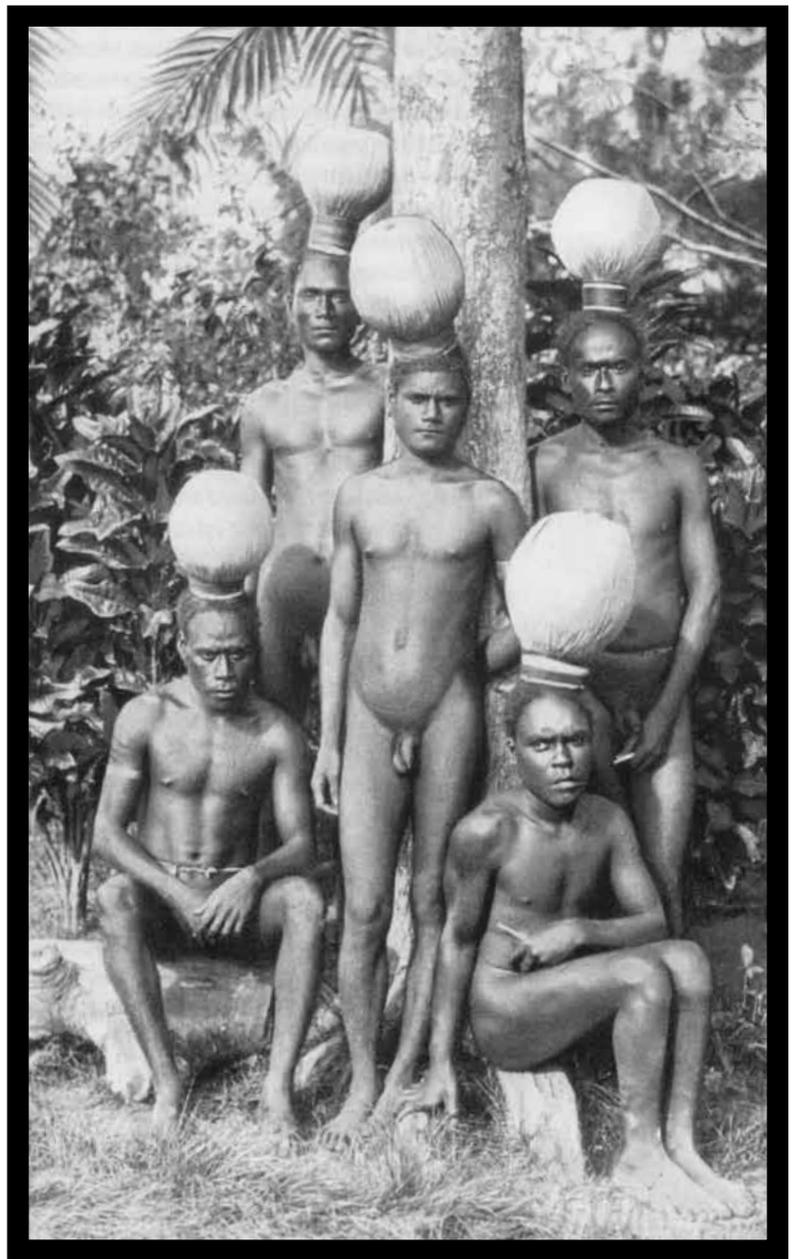
without means; and even when one or other crop occasionally fails, there are always sufficient others to prevent real deficiency. Thus, from these regions I do not know of a single case of starvation, or even the remotest resemblance of one. In comparison with the inhabitants of many other tropical lands – for example, India – the inhabitants of the Bismarck Archipelago and the Solomon Islands are in this respect to be envied.

Besides the indigenous products of the plant kingdom, each year more and more individually introduced plants are being established. Maize and watermelons, which I introduced to the Gazelle Peninsula in 1882, spread rapidly, also pumpkin, pineapples and, as already mentioned, tapioca. Orchard trees, which bear fruit only after long years, do not so easily find entry. The natives want to see a result of their industry as soon as possible, and do not readily comprehend cultivating a plant that only yields a visible benefit years later. It is, therefore, also difficult to convince them to plant out coconut palms, although they have been familiar with their nuts for a long time.

To satisfy their other needs, the plant kingdom provides the natives with a veritable wealth of products, which the native exploits in only a small measure, and which, with enough energy and labour, would be capable of making him prosperous, whereas usually he lives from hand to mouth.

Numerous trees provide wood for both canoe and house construction, and experience has taught selection of those woods best suited to the intended purpose. The tough, broad leaves of the different species of pandanus provide long-lasting roofing material, and from the leaf ribs they weave big and small mats, baskets and pouches. Crushed nuts of *Parinarium laurinum* serve as putty for caulking canoes, as a plastic material for reproducing faces on many masks, as an outer coat on dense matting to make it impermeable, and as a storage vessel for liquids, as, for example, the oil jugs in the Admiralty Islands.

Not only the coconut and the banana tree provide fibre; the natives know a number of fibre-producing plants besides these. Thus, on the Gazelle Peninsula, from the fibres of *Pueraria novo-guineensis* they produce the fine twine for making fishing nets. This fibre is not inferior to our best flax, yet it cannot be exported because the natives cannot be persuaded to produce sufficient quantities, although there is an abundance of this material. Several species of hibiscus likewise deliver an excellent fibre. Species of rattan, which make penetration into the forest so exceptionally difficult that they have been called ‘bush lawyers’ by the whites, are twisted together in threes or fours, according to length, to serve as anchor chain often up to 400 metres long; narrow strips of the outer hard bark serve as binding material.



**Plate 51** *Matasesén*  
from northern  
Bougainville

There is an over-abundance of bright flowers, brightly coloured leaves and fragrant plants on all the islands, and the inhabitants use them most extensively as body decoration, and for decoration of their canoes, huts and ceremonial sites. They ensure that sufficient stock is always available, and plant red-flowered species of hibiscus, fragrant gardenias and bright-leaved crotons around their huts and villages. Their fields and gardens not uncommonly resemble a flower garden, for among the taro and yam plants they grow purple-leaved and multi-striped species of *Dracaena*, shining yellow and red coleus and numerous fragrant plants.

The native also obtains dyestuffs from the plant kingdom. Turmeric roots provide a yellow dye; soot and charcoal mixed with oil give a deep black. On Bougainville, various fibrous materials are dyed shiny red.





The list of useful plants would be incomplete if the various species of bamboo were not mentioned. They provide the material for building houses and huts; laid side by side and secured by cross-pieces, they make an excellent raft on which the natives often go for miles out to sea; across rivers and ravines they build light and safe suspension bridges and gangways; long and short pieces find use in carrying water; huts and gardens are surrounded by strong bamboo fences for protection; on New Hanover and northern New Ireland they make spear shafts from them; also, splendidly carved hair combs and boxes decorated with artistic branding for storing lime powder, are made from bamboo; the knowledge of making musical instruments from it is demonstrated by the large and small pan pipes of the Buka people and the splendid flutes of the Gazelle Peninsula, but in addition large and small pieces of cane serve as primitive drums; metre-long lathes of bamboo, bent over in the middle, serve as fire tongs; narrow strips of the hard outer layer provide knives with razor-sharp cutting edges, that I saw, for example, on Bougainville, being used for shaving; large and small fish-traps are made from thin, split strips of cane. In short, the native might often be quite helpless if he had no bamboo cane.

Ever since the Solomon Islands developed trade, a local species of palm, the ivory nut palm, *Coelococcus solomonensis*, Warb., became of great importance because the hard ivory-like nut became a trading article. The palm prefers to grow in swampy ground; after a certain number of years a huge flower stalk rises out of the middle of the crown, and the numerous fruits come from this flower. After the fruit has ripened, the whole tree dies.

It must also be mentioned that the healing properties of many products of the plant kingdom are not unknown to the natives. Flowers, fruits, leaves, bark and roots of various plants are used by the indigenous medical specialists, and many of them fulfil their purpose. However, the injurious properties of many plants and parts of plants are also known, as are the effects of the various plant toxins. Many of the medicines and poisons, though, are merely magic potions, which have neither beneficial nor deleterious effects, but whose magical powers are regarded by the native as beyond all doubt.

Members of the animal kingdom find far less use. The number of mammals is small, and, apart from rats and mice, anything that runs on four legs provides a desired roast. The universally indigenous pig, existing both in the domesticated and the wild state, is never missing from any feast, even though in the Duke of York Islands and on part of the Gazelle Peninsula eating pork is forbidden to many men who belong to the *ingiet* society. There, the same prohibition covers turtles and sharks as well. The lower jaws of pigs that have been eaten, often

intermingled with the lower jaws of men that have been eaten, are stored in the huts as souvenirs of great feasts.

Small bunches of bristles serve as an ornament, as do the big, abnormally curved, often ring-formed tusks that are held in high regard and are artistically displayed.

The flesh of man's real companion, the dog, is regarded everywhere as a delicacy, and its canine teeth replace our token coins in many places or are made into ornamental items. However, the dog is also trained to hunt pigs and marsupials.

The various species of marsupial, as well as the flying fox, are likewise not to be despised as a food source.

Of the reptiles, the turtle is the most coveted. The succulent flesh and the eggs are highly valued everywhere, as is the turtle shell, from which ornaments and jewellery, fishhooks, scrapers and spoons are made. Snakes are said to be eaten in a few areas; but this is probably the exception, for as a rule the natives are afraid of snakes, just as Europeans are. The same goes for species of lizard; in the archipelago the skin of the monitor is used as a drum skin for the familiar hourglass-shaped wooden drums.

The bird kingdom provides no great contribution to cooking, yet cannot go unmentioned. The domestic fowl is naturalised everywhere; both flesh and eggs are favourite foods. Of the wild birds, on New Britain the cassowary stands out; its flesh is very tasty. The bird's upper thigh bone is used for decorating spears; the spear points are armed by the sharp claws. Generally, the native eats any bird that falls into his hands. Bright bird feathers, especially parrot, rooster tail feathers, cassowary feathers and down, are put on as body decoration, headdresses, necklaces, and so on, and at festivities they are not lacking as effective ornamentation of many weapons, canoes, dance objects and the ceremonial site.

The sea offers wealthy treasures that do not go unnoticed. Numerous fish from the largest to the smallest serve to quell hunger, and experience has taught them to avoid those that have poisonous properties. Shellfish and snails as well as various molluscs are also eaten; however, the Melanesian is far more selective than the Polynesian, to whom everything in the sea appears to be a delicacy. Therein lies a significant difference, in that the Melanesian eats all seafood only when cooked, while on the other hand the Polynesian often eats them raw. Shellfish and snail shells in the natural and processed state provide material for all kinds of jewellery: they are used as coin tokens, and sharp axe blades are made from them. A round hole is bored through the side of the triton shell, which then serves as a far-sounding trumpet.

The insect kingdom is exploited to a small degree. Several species of grasshopper, cicadas and chafer beetle larvae are not rejected, and the head





louse is universally regarded as a delicacy. These are collected reciprocally in a neighbourly fashion during leisure hours.

The reef-dweller known in *Samoa* as the *palolo* worm is also found in the Bismarck Archipelago. It is hunted here too; however, it is not regarded as such an extraordinary delicacy as it is in Samoa.

The mineral kingdom is less productive. As far as is known, metals occur exceptionally here and there, but the natives do not know how to mine them nor work them.

On the Solomon Islands and in the Admiralty group all kinds of pottery are made from clay. The Baining make bored-through clubheads out of hard basalt rock, while axe blades are made from similar material on all the islands. On Buka, heavy stone pestles are used for crushing hard nut kernels. Sharp slivers of obsidian are used for spear tips and dagger blades by the Admiralty Islanders. On New Britain and southern New Ireland they use egg-shaped sling-stones found in river beds and on the beach. Drill bits are made from hard slivers of quartz or obsidian in the Duke of York Islands. For the healer, larger sharp slivers replace the scalpel used by his European colleagues; such pieces also occupy the place of our razor blades, although

today the civilised lager beer bottle has replaced the original material. Before the introduction of iron tools, the carvers made use of sharp slivers of obsidian, by the aid of which they produced finer objects than with the modern iron tools.

Everywhere that betel chewing is performed, burned powdered lime is used together with the *Areca* nut and betel pepper. The native paints his canoe inside and out with lime, and whitewashes his house with it on the Matty Islands. Lime slurry is rubbed into the hair and beard, partly to keep out vermin but rather more to make the hair paler. For dances, ceremonials and war expeditions the native paints his body with fantastic stripes, dots and circles, using either lime or burnt red ochre; for staining the teeth black they use types of earth containing manganese, which is a traded commodity because it does not occur everywhere. On southern New Ireland large and small ancestral figures in human form are made from a local chalk.

Salt is harvested in isolated places by evaporation (for example, at the south cape of New Britain); however, as a rule the native uses sea water as a condiment for his food.



