Palms have been the most important family of plants to tropical man since long before the dawn of recorded history. From them he gets shelter, food and furniture and they are important also in medicine and magic.

Malaya is a land of palms—from the graceful coconuts of the strand and the serried, squat ranks of the oil palm plantations of the lowlands to the Giant Fishtail Palm of the hill resorts and the ornamental palms from all quarters of the tropical world which grace many towns. The Malay archipelago has more palms than any other area of a similar size; and Singapore Island itself contains more species than the entire African continent.

In this book, palms are distinguished from other plants and their construction is briefly outlined. All the genera of wild palms together with the commoner introduced ones and a few rare ones of particular interest are described. In addition, the author attempts to show the important part palms play in the cultural and natural heritage of the Malay archipelago.

Keys and descriptions in non-technical language are provided as aids to identification and there are 106 line drawings and 16 plates.

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PALMS OF MALAYA

PERPUSTAKAAN
NEGARA MALAYSIA
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Part One

INTRODUCTION
Malaya is a land of palms, from the graceful coconuts of the strand and the serried squat ranks of the oil palm plantations of the plains, to the Giant Fishtail Palm* of the mountain resorts. And as we look more closely we see more palms: the rain forest undergrowth is crowded with palas,* and pinang, several species of each growing together in any one place, others (bayas, ibul) emerge from its canopy, and the climbing rattans push and scramble through the canopy, impeding progress with their cruel spines. There are even salt water palms in the mangrove forest, especially the nipah, the prickly nibong and the Mangrove Date Palm; and in swamp forest the brilliant Sealing Wax Palm, pinang raja, and the sour-fruited kelubi or asam paya. There are palms to near the tops of the highest mountains. Nowhere in the primary jungles which cover much of the country is one far from a palm, and it comes as no surprise to learn that, with 34 wild genera and 220 wild species, Malaya is one of the most richly endowed palm lands of the world. There are as many palms recorded from Singapore island (18 genera, 46 species) as on the whole of mainland Africa (15 genera, 50 species); and more than Ceylon (10 genera, 21 species). Four of the 34 genera are endemic to Malaya: that is they do not grow anywhere else.

There are a few palms on limestone hills (langkap is particularly common, and two serdangs grow nowhere else) and in the open sandy heaths. The palms of primary forest undergrowth are mostly very sensitive and soon die after the trees are felled and their dim and humid habitat has been destroyed. The only palmless country is the secondary forest which results from complete felling and subsequent burning and cultivation. The single palm which has successfully adapted to this man-made environment is the rabok or tukas. Locally in the rain forest very dry ridges are poor in palms.

Man has added to nature’s rich endowment, and many towns are graced by Royal Palms from Central America, Princess Palms from Mauritius and Rodrigues, and the Chinese Fan Palm, just to name three of the most commonly introduced species.

The study of palms has been sadly neglected, and the purpose of this book is to introduce them to Malayan naturalists. For, although we can all recognize a palm when we see one, yet it remains difficult to learn more about them. It is hoped to show that palms are not merely subjects for learned investigation, important though that is, and that, although something is known of their biology and distribution, much more remains to be discovered, by simple, careful observation.

Palmes have been the most important family of plants to tropical man since long before the dawn of recorded history and it is also the purpose here to illuminate the important part they play in the cultural heritage of Malaya and neighbouring countries.

Sword Trees

The main component of the Malayan jungle is broad-leafed trees. These trees are called Dicotyledons because they have two seed leaves (cotyledons). Palms by contrast are Monocotyledons and have only one seed leaf. The Monocotyledons of temperate countries are all small plants: grasses, sedges, lilies, orchids and so on. In the tropics there are big Monocotyledons. Malaya has giant Monocotyledon herbs in its bananas (pisang), gingers (tepus) and aroids (keladi) and also Monocotyledon trees in its palms, pandans and the introduced Traveller’s Palm; then there are the bamboos. These are something quite beyond the experience of persons brought up in temperate countries, and contribute to the overwhelming impression of strangeness and luxuriance of the vegetation felt on entering the

* For scientific names see the indexes of vernacular names p. 123 onwards.
† Technical terms are kept to a minimum, those which cannot be avoided are explained in the glossary at the front of the book.
tropics for the first time. All Monocotyledon trees reflect their underlying common characteristics in certain similarities in appearance, which set them apart as a class from Dicotyledon trees. They may be called sword trees from the young leaf projecting erect from the crown (Figs. 2, 38, 73, 92, 96). First it is necessary to clear away a confusion by distinguishing the palms from other sword trees in Malaya.

All sword trees have a few very big leaves formed one at a time at the stem tip from a lot of material, and the leaf base is broad and encircles the stem. The broad base is necessary to ensure enough connexions between the water and food conducting tracts of the stem and the huge leaf. A broad leaf base is a feature of all Monocotyledons. Only one such leaf can form at the tip at a time, and this is why there is only one seedling leaf. The state of having one cotyledon is thus a side product of the ‘plumbing’ arrangements.

The palm leaf blade is folded (pleated), and the folds are either displayed more or less at right angles along both sides of a long stalk (the rachis), as in the feather palms, or else arise crowded from a short stalk (the costa or rib), as in the fan palms. The folds develop as the leaf grows in the bud before it is unfurled. As the blade unfurls little cushions of water filled cells called pulvini develop to push out the folded leaflets at an angle to the stalk; and these can still be seen on the mature leaf. Not long before the leaf opens and after other development is complete, the cells of the surface often divide to form hairs and scales, of incredible beauty and complexity when seen under the microscope. The loose surface layer so formed acts as a lubricant during the opening of the leaf, and some of it sometimes persists on the mature leaf, especially on the sheath and stalk, for instance the fluff well-known as a tinder in rabok (tukas).

The other Malayan sword trees do not have such complicated leaves. In the pandans the leaf is long and strap-shaped, and has a few pleats running along its length, not across, so it is like a shallow M in section. Moreover, nearly all pandans have branching stems whereas all Malayan palms have a single unbranched trunk with a single terminal crown. The pandan leaf grows from the bottom and is not folded up in a bud.

*Cycas*, the paku gajah or bogak, is a feather leaved tree of seashore and lowland forest with a squat stout trunk to about 20 ft. which is easily mistaken for a palm. The resemblance is entirely superficial. *Cycas* is a quite unrelated primitive seed plant without flowers, which bears big terminal male and female cones and has naked seeds. The leaves are very tough, and very dark green. The leaflets are quite flat, not folded (Fig. 5), and are curled up like springs in the young leaf, as in a fern. Moreover the trunk commonly branches several times, though in the wild in Malaya rather uncommonly. Therefore *Cycas* need not be mistaken for a palm.

The wild bananas are giant herbs; the so-called trunk is really just a lot of leaf bases rolled round each other. Only when the flower stalk pushes its way, creaking and groaning, up the centre, does the plant have a stem. The Traveller’s Palm (*Ravenala*), introduced from Madagascar, is a banana ally and not a true palm at all although it is often mistaken for one. It differs from the native wild bananas in possessing a trunk below the crown which in this case has the leaves displayed in two ranks like a giant fan (Fig. 1). Leaves of the bananas are not pleated. In bud one side of the blade is rolled round the other, which
is the reason that the leaf base is usually unequal. The young leaf looks like a conductor's baton (Fig. 2). The blade is delicate and often becomes torn in the wind into a tattered feather, quite different from that of a palm. The Traveller's Palm has sheathing leaf bases in which rain water gathers, and gets its name from this source of drink for the thirsty traveller.

Bamboos are giant woody grasses. No one is likely to confuse one for a palm.

It is beyond the scope of this book to analyse any further the differences between Monocotyledons and Dicotyledons. Those who are interested will find a stimulating account in Corner's *Natural History of Palms*. It is necessary, however, to describe, in outline at least, the construction of a palm so that the descriptions later in the book become meaningful and can be used to build up a mental picture of an unknown palm.
2 Palm Construction

The seedling palm builds up an inverted cone from small beginnings, and when this has reached full width the stem commences upward growth, and does not thereafter increase in diameter. The first leaves usually have undivided pleated blades, and later developed ones are of increasing size and complexity. So palms are columns, hooped by the leaf base scars, and topped by the crown of big leaves. There is no secondary thickening in roots either, these are formed at or near the ground in large numbers and may cause the butt to swell out; they die, rot and are replaced. The stem is traversed by numerous small, separate vascular bundles, each with a hard fibrous sheath. In some palms (e.g. coconut) the bundles are more or less evenly spaced, in others (e.g. nibong, rumbia) they are concentrated at the periphery of the trunk, from which hard springy planks can be made, though these trunks are hard as steel to cut.

'Like a foolhardy gambler the palm stakes all on a single card';¹ that is to say, less picturesquely, that it has only one bud and that one apical, and if it is destroyed the palm dies. In the big Malayan palms the bud is either protected by fierce spines on the leaf bases and stalks (bayas, nibong, the serdangs, Plate 13) or (in ibul and the Fishtail Palms) the tissues are dangerously poisonous, or in kabong and langkap the covering leaf base is like a coarsely fibred sack. Without such protection hungry animals would long since have wiped out these species; even so the cabbage of the Tahan serdang is frequently eaten by elephants. The crown once formed is of constant size not increasing with age, and every time a leaf falls another one opens.

Palm leaves, as has been said, are always folded (Plate 14). Most are feather-like (pinnate), some are fan-like (palmate), a few are undivided. The leaf stalk below the leaflets is often spiny-edged, and in Borassodendron it is smooth and sharp as a knife. In the rattans and their allies and Oncosperma (bayas, nibong) the back of the leaf stalk and its base also are spiny. The leaf base encircles the stem below the big bud (often called the cabbage) to form a tube. In most palms the tube is short, and may be almost non-existent, but in the Betel subfamily (Arecoideae)* it is typically long and cylindrical and forms a crown shaft at the top of the trunk (see Fig. 3). The crown shaft is usually green or greyish, as in the Royal Palms, but exceptionally, in the Sealing Wax Palm or pinang raja, it is scarlet.

The leaflets may contain one pleat, in which case they are pointed (leaflets simple); or several (leaflets compound), when they are either pointed or jagged at the tip (praemorse, or bitten-off in appearance) and usually fishtail in shape, (Figs. 4, 7).² The terminal leaflets are often compound, even where the lower ones are simple. More important, the leaflet may be trough-like (in duplicate) or roof-like (reduplicate,³ Fig. 5; this apparently insignificant detail is correlated with leaf development and runs constant within large

* The subfamilies are introduced and described in chapter 5.