Last of all in the scent field we must remember the old Maori favourites, of which the scent was extracted into titoki or other oil with which bird skins or other suitable material was saturated and enclosed in a sachet worn around the neck. Frequently the sachet was woven of the holy grass *Hierochloe redolens* or karetu, which was itself sweetly scented. Many of the old scents are mentioned in chants and stories and are regarded as great treasures indeed. One of the great scents is that of the taramea or spaniard. The common species would be *A. squarrosa* but the scent can be got from most species. If the leaves are incised, the resinous sap pours out and fairly soon solidifies, and can be collected readily. My wife and I collected some from the majestic *A. scott-thomsonii* around Hakataramea (note the name) where we saw large black weevils drawing the sap from the leaves. Then the Maori talked much of raukawa, or *Pseudopanax edgerleyi,* and tarata and kohuhu (*Pittosporum eugenioides* and *P. tenuifolium*). The piripiri fern is often mentioned which is, I think in this case, *Hymenophyllum sanguinolentum* though *H. demissum* also seems to go by this name. *Phymatodes scandens* or mokimoki is another famous name although it does not particularly appeal to our noses. The karetu itself abovementioned is also the subject of much praise.

I have probably forgotten some tastes and smells that I know and omitted many that I simply have not yet noticed, but I will keep on trying. I am told that some liverworts have distinctive smells so this is another field for investigation on the ground.

Annual Growth of New Fronds on Dicksonia fibrosa

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A tree fern, *Dicksonia fibrosa* (wheki-ponga), has been watched for six successive seasons, from 1972-73 to 1977-78 inclusive, with the object of finding out the average number of new fronds produced annually and any trends in the sequence of their growth.

The fern is growing in a Levin garden, sheltered on the south but exposed on the north side. It has been shifted several times in its early life and 1972-73 was the first season when normal growth of a large number of fronds began. The climate during the observation periods has included many extremes and variations but the eruption of new fronds has followed a remarkably uniform sequence.

During the early winter no dormant coils of young fronds can be felt in the central cavity at the top of the caudex. By early July the cavity is crammed with coils well down under a blanket of loose scales. By mid-August many coils are level with the top of the cavity, and their final emergence depends on sufficiently warm weather. As

the season progresses, with the air and ground becoming drier, it is a good shower of rain which brings out the extra fronds. Any which come up in periods of drought have shrivelled tips and sometimes the whole frond is dwarfed and deformed.

Summarised details of the growth rhythms are shown in the accompanying table from which it can be seen that about 75% of the new fronds usually come up between mid-October to mid-December, though the period is sometimes extended at either end. At this stage the top of the caudex has no more space and there follows a rest period of about 31-52 days. The rest period may be divided if, as occasionally happens, one or more fronds come up during this time. From early January the other 25% of fronds come up, one or two at a time at short intervals until mid-March or early April or up to late April if the ground remains warm, and there is warm rain.

	First fronds	Rest period	Later fronds	Total
1972-3	41 24 Oct. — 26 Nov.	44 days	13 9 Jan. — 18 Mar.	54
1973-4	45 24 Oct. — 11 Dec.	25 days	17 5 Jan. — 27 Feb. (plus 2 late April)	62
1974-5	43 14 Sept. — 6 Jan.	31 days	12 6 Feb. — 7 Apr.	55
1975-6	45 15 Oct. — 18 Nov.	51 days	15 8 Jan. — 12 Mar.	60
1976-7	40 18 Oct. — mid Dec.	32 days	16 mid Jan. — 31 Mar.	56
1977-8	32 late Oct. — 20 Nov.	51 days	17 10 Jan. — 25 Apr.	49

No attempt has been made to trace any pattern of frond arrangement, as described by W. R. Esler for mamaku in *Bulletin* 39. With so many fronds erupting within a short time it would be difficult to record their positions, which appear rather haphazard. There is no pattern of scars as the caudex is covered with a mat of rootlets.

The previous season's fronds usually stay green till the end of the next growing season. I remove these from the plant soon after the last new fronds are fully grown so their exact length of life has not been noted. By that time some are looking dishevelled and starting to brown off. In natural conditions the dead fronds hang downwards and in a moist climate, as in the centre of the North Island, some become partly covered by an increasing growth of the root fibres which give the caudex its characteristic stoutness.