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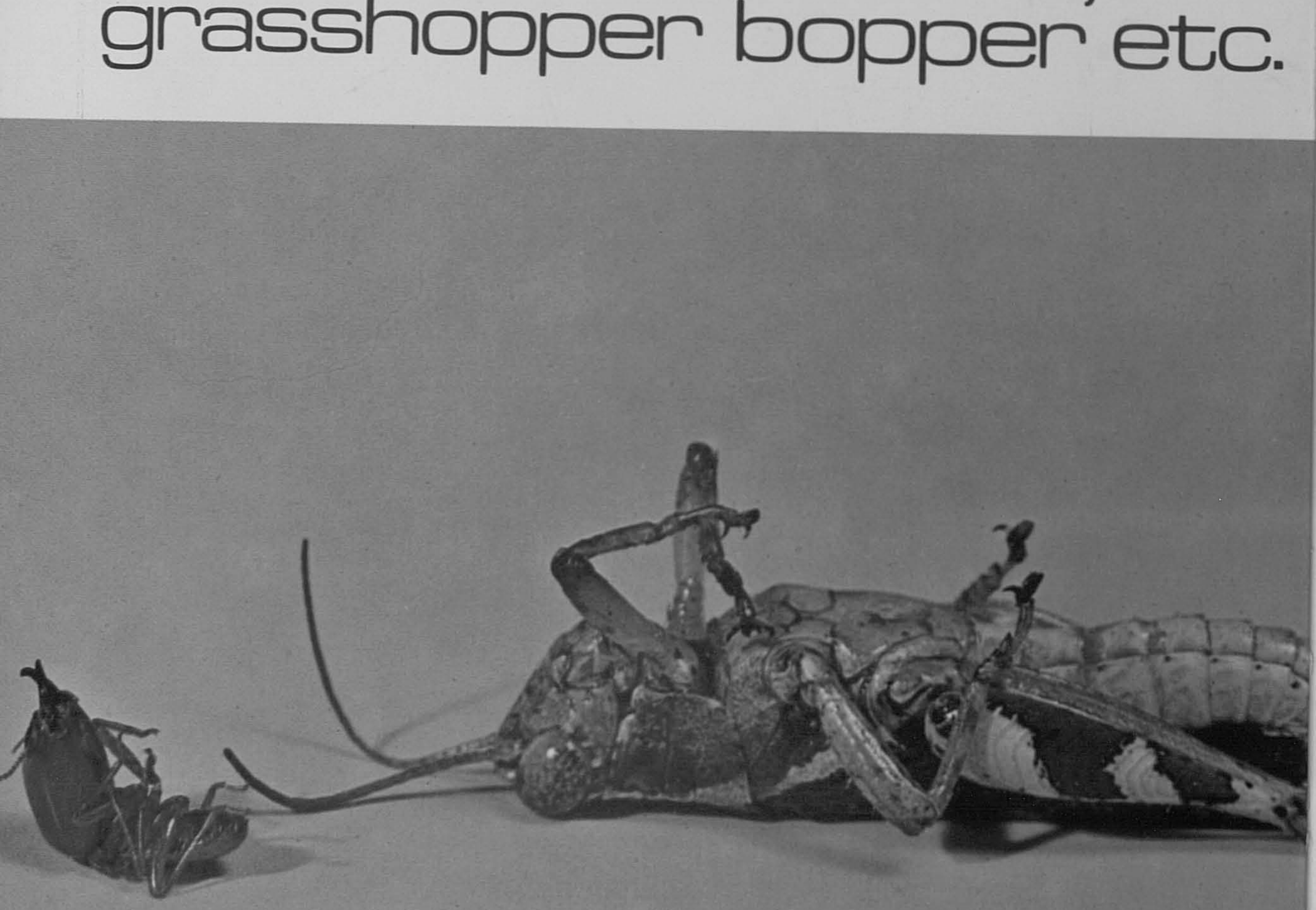
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N O T E

The Planter *assumes no responsibility for the statements and opinions expressed by contributors.*

Editorial:

The facts of life

Many rubber estates with estate-born labour populations suffer economically from over-population. They are morally obliged to sustain high labour intensiveness even where this means running at a loss, or just breaking even.

One such estate produced its all-time record monthly crop of one million pounds of rubber in January, yet its f o b Singapore was 39 cents, which meant just breaking even. Even two million times nothing is still nothing and this estate, like so many others, requires desperately to reduce its labour intensiveness but cannot do so for obvious reasons. These estates are willing to produce less rubber at a better profit margin by changing from their well-nigh compulsory alternate-daily tapping systems to third-daily systems.

The resident estate worker enjoys several advantages over his urban counterpart: free accomodation, electricity, water, recreational and health facilities etc. but above all, the high probability that his wife will also be employed and thus become eligible for maternity benefits.

From the latest MAPA/NUPW agreement, we infer that the average tapper's income in a month of 26 working days is $96.20. With his wife almost certainly working as well, probably as a tapper, the combined income is $192.40. An employed female is entitled to a payment of $180 as maternity benefit for every child she produces. Even if she works for only one day during the ninety days preceding the birth, and even if the child is illegitimate, she still qualifies for maternity benefits. There is no guarantee that the money will go towards the welfare of the mother and child, and much evidence that it will find its way to the liquor shop or goldsmith's.

Following ten years of active Family Planning propaganda on estates, through film shows, talks in the vernacular, free availability of IUDs and Pills, estate workers remain notably unco-operative in the family planning field. Some openly admit that as long as the $180 per child keeps coming, so will the children. There was an authenticated case of a 'professional' husband, himself unemployed, who had four working wives on an estate. This arose when four 'divorced' or deserted wives—humanely kept in employment by the estate—banded together and bought themselves a husband. With each wife producing a child every year, the husband earned $60 a month in maternity benefits.

Educational facilities on most estates are of such low standard that pupils can rarely aspire beyond the LCE, and the pass rate is no higher than about 5 per cent. This means that the drift to the towns, even for blue-collar jobs, is not taking place and that the dependant estate populations are steadily growing. Even the retired ones have nowhere to go, and remain to swell the dependant populations. This involves estates in having to build more accomodation to comply with Labour Ministry density regulations, even where the estates are not making a profit.



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Compare the lot of these estate workers with that of say, the urban vehicle driver with an average income of $135.00 who has to rent his house or room, pay for water and electricity, and has only rare opportunities for his wife to be employed and thus qualify for maternity benefits. His one advantage probably is that the free education for his (fewer) children is of a higher quality.

At this period in the history of Natural Rubber, with its fight for supremacy over the synthetic product, the conditions referred to are enough to stifle any plans for replanting with rubber. This could mean that other NR-producing nations with lower labour costs and an awareness that in the long term NR will predominate over SR, will step in and oust Malaysia from her position as the world's leading producer.

It is almost axiomatic for trade unions to seem bent on killing the goose that lays the golden egg, and it is to say the least disheartening that at this point in time, the National Union of Plantation Workers and the Malaysian Agricultural Producers' Association have just concluded an agreement on the solitary subject of wages, completely ignoring the pressing socio-economic problems surrounding the Malaysian NR scene.

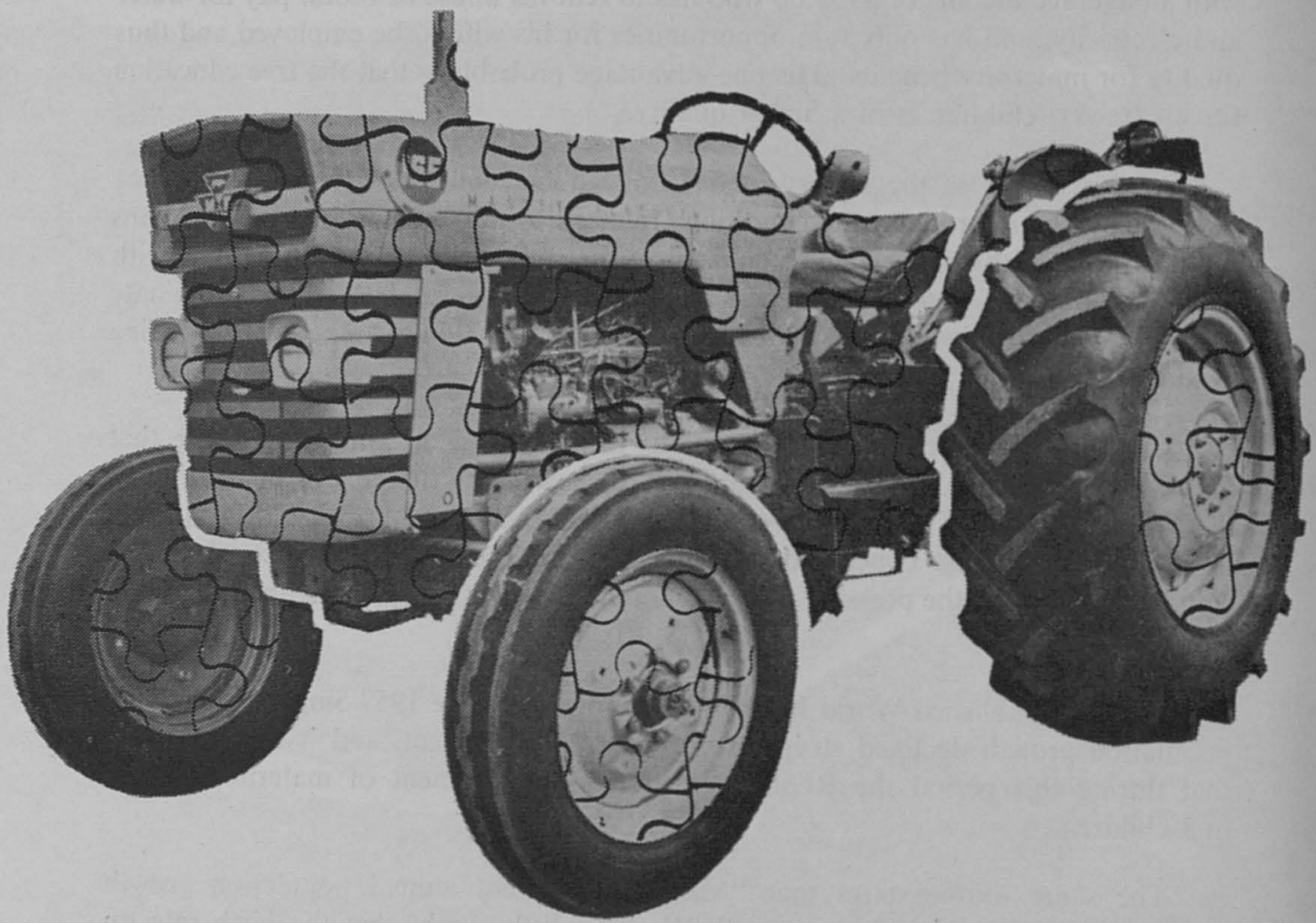
Recently published World Bank figures show that since 1959 Singapore's annual population growth declined steeply from 4.1 to 1.7 per cent, and it is noteworthy that during this period the Republic restricted the payment of maternity benefit to 3 children.

The same source states that "Malaysia's present annual population growth remains at a fairly high 3 per cent." We have little doubt that the birth rate on estates, at least in Malaya, exceeds the national figure, and consider that the granting of benefits for an unlimited number of children encourages irresponsible procreation.

If the Malaysian government limited maternity benefits to the first three, or even two children, it would still be some time before the effects were felt. As a positive contribution to the solution of this problem, and one which can be effected immediately, we would suggest that all female estate workers who are not bread-winners, or such less number as would restore viability to an estate's economy, should be retrenched. In other words, they should assume their proper responsibilities as housewives and mothers.

OUR NEW COVER shows a fine view of young oil palms on Prang Besar Estate, Kajang, Selangor, and appears by courtesy of Golden Hope Plantations Ltd.

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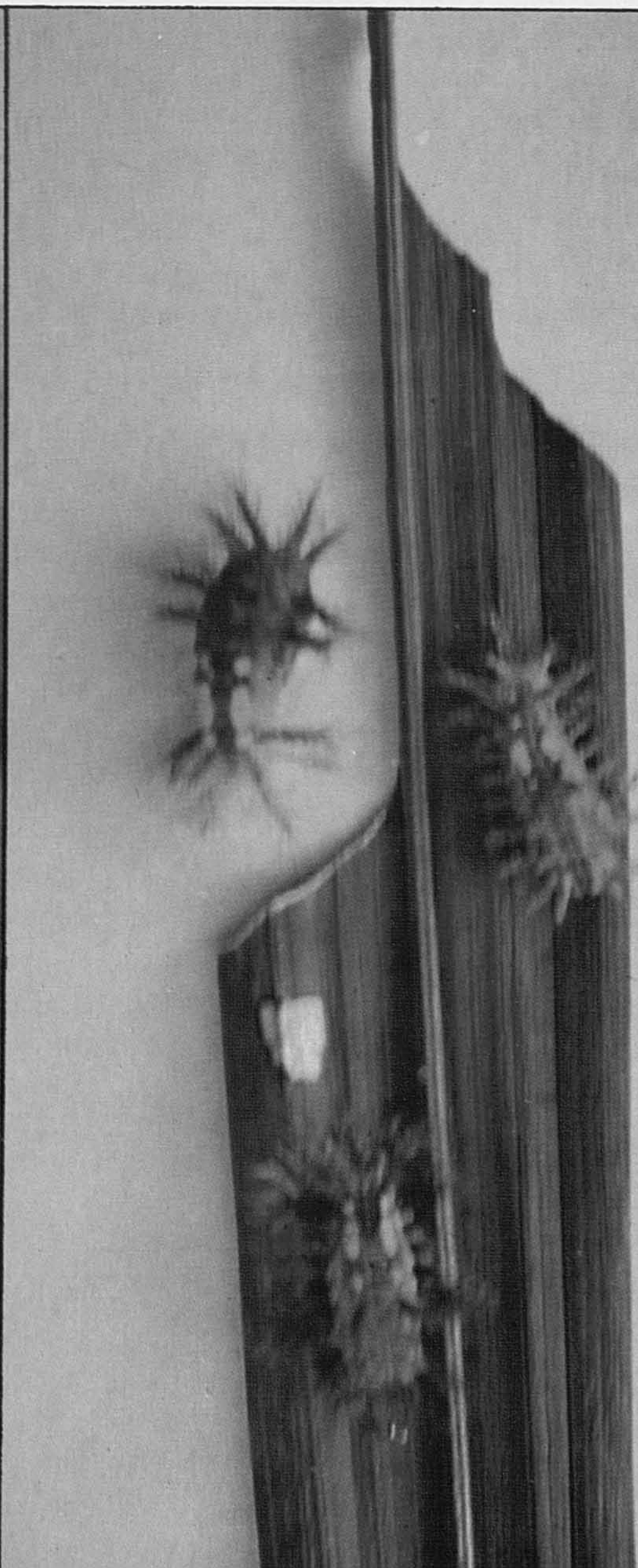


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Planter, Kuala Lumpur **48:** 90–92 (1972)

A new wild citrus from Malaya

BENJAMIN C. STONE *

SUMMARY

The discovery of an undescribed species of *Citrus* inhabiting hill forest in Malaya and lower Thailand is reported, and the possible value of the species in relation to citriculture is suggested. The significance of the discovery is discussed in relation to the present state of *Citrus* classification. A brief list of Malayan localities is included and various portions of the plant are illustrated.

INTRODUCTION

The potential use and value of a new and untested species in any commercially important genus is difficult to predict. In many cases the existence of wild relatives of cultivated species has been more or less ignored, especially in the past, but in recent years more and more attention has been focussed on these often little-known species. In crops such as potatoes (*Solanum tuberosum*), tomatoes (*Lycopersicon esculentum*), and bananas (*Musa* spp.), to name but three examples, deliberate breeding programs have yielded much important data on the role which wild related species can play, and techniques for making the best use of them worked out. But there are no hard and fast rules, and only research involving a given genus can establish what the role of wild relatives can be. Nonetheless it may be said that in the constant search for improved cultivars (improved, that is, in the views of men) the vital importance of wild related species has been amply borne out. For this reason, conservation of genetic materials is of great value, even when no immediate prospect of use is in sight. Indeed it is sometimes the case that plants conserved for one reason may end up as valuable for very different reasons. Only continuous investigation of genetically valuable features can reveal potential uses; and the uses are apt to differ from one agricultural or economic context to another. Tastes, markets, and other factors change as surely as the plants themselves. The value of a wild species is often potential and, therefore, undiscovered.

TYPES OF CITRUS

Species of *Citrus* need no introduction. Who is not familiar with—and does not enjoy—oranges, mandarins, lemons, limes, and grapefruits? In Malaysia we can also find several lesser-known but interesting kinds of Citrus, such as the limau perut (*Citrus hystrix* hybrids) and the limau kesturi (*C. mitis*). There is the related genus *Fortunella,* as well, exemplified locally by the attractive limau pagar (*F. polyandra*), often cultivated as hedges. Apart from these, Malaysia can boast a large number of related genera, not usually directly used, but of much botanical and possibly potential agricultural interest, such as *Burkillanthus, Merrillia,* and *Merope.* Though these have been known to botanists for about 35 years, they have never been the focus of active practical research, and indeed, their fundamental botanical relationships are not completely clear.

* School of Biological Sciences, University of Malaya.

Agriculturists who know *Citrus* are aware of how easily these plants can interbreed. Equally they are aware that seeds can be produced by a non-sexual process as well as by the normal sexual means, and indeed in many well-known types of citrus fruits the seeds are all or nearly all non-sexual in origin. These can sometimes be told by the occurrence of several embryos within a single seed. These proclivities of *Citrus* delight the plant breeder and dismay the botanist. To the former it means endless possibilities of character recombination through experimental hybridizations. To the latter it means an enormous problem in classification and extreme difficulties in evaluating the status and explaining the origins of the less-known species and forms. Because *Citrus* is native to Asia, one logically looks to this region for examples of unambiguous wild species as a 'rock-bottom' basis for a rational and natural classification. However, many of the regions where *Citrus* is native have experienced through thousands of years of human history the destruction or total alteration of their natural vegetation and its replacement by an essentially man-made or man-influenced landscape. In such situations it is extremely difficult, if not impossible, to be certain that a seemingly 'wild' plant is, in fact, wild. Furthermore, the migrations of peoples, bringing with them their crops, trading with other peoples for theirs, has led to a wide intermixture of species, providing for *Citrus* species at least, easy chances of hybridizing.

A NEW SPECIES OF CITRUS

The reader having noted the above points will appreciate the kind of importance which the discovery of an unquestionably wild *Citrus* would have. Such a *Citrus* has been found in Malaya. In fact, the first known collection is dated 1924. Since then about eight other collections have been made, all from the main range between about 2 000 and 4 000 ft altitude, in forest—evidently a well-defined habitat. Collections range from Selangor northward to Kedah, and the species extends into the Kra Peninsula (lower Thailand) according to a note by Tanaka on a specimen in the Singapore Herbarium. Although Tanaka made a brief study of this species in 1936, even proposing a name for it, he never published his results, and no one else evidently ever studied this material (including Swingle, who with Tanaka was a foremost authority on *Citrus* up to 1960).

The writer had to deal with this species when writing up the *Citrus* family for the new 'Forest Flora of Malaya' which is being prepared by the Forest Research Institute, Kepong, under the editorship of Dr. T. C. Whitmore. In my treatment (in vol. 1, just issued) I referred to this plant as '*Citrus* species A'. This non-committal reference was made because ecological considerations showed conclusively that it was a native Malayan species. Most of the collections state that it occurs in undisturbed primary forest. The code name was given because at the time it still seemed possible that someone, somewhere, sometime, had named this plant. Among the 800-odd names for *Citrus* (not counting the 'fancy' names and names of clones) it seemed possible that one already existed for our plant.

After intensive search however, it appeared that no published name for *Citrus* species 'A' had yet appeared; only the manuscript note by Tanaka, who certainly deserves credit for recognizing this plant as new. (In fact, he noted it as a new genus, which is going too far!).

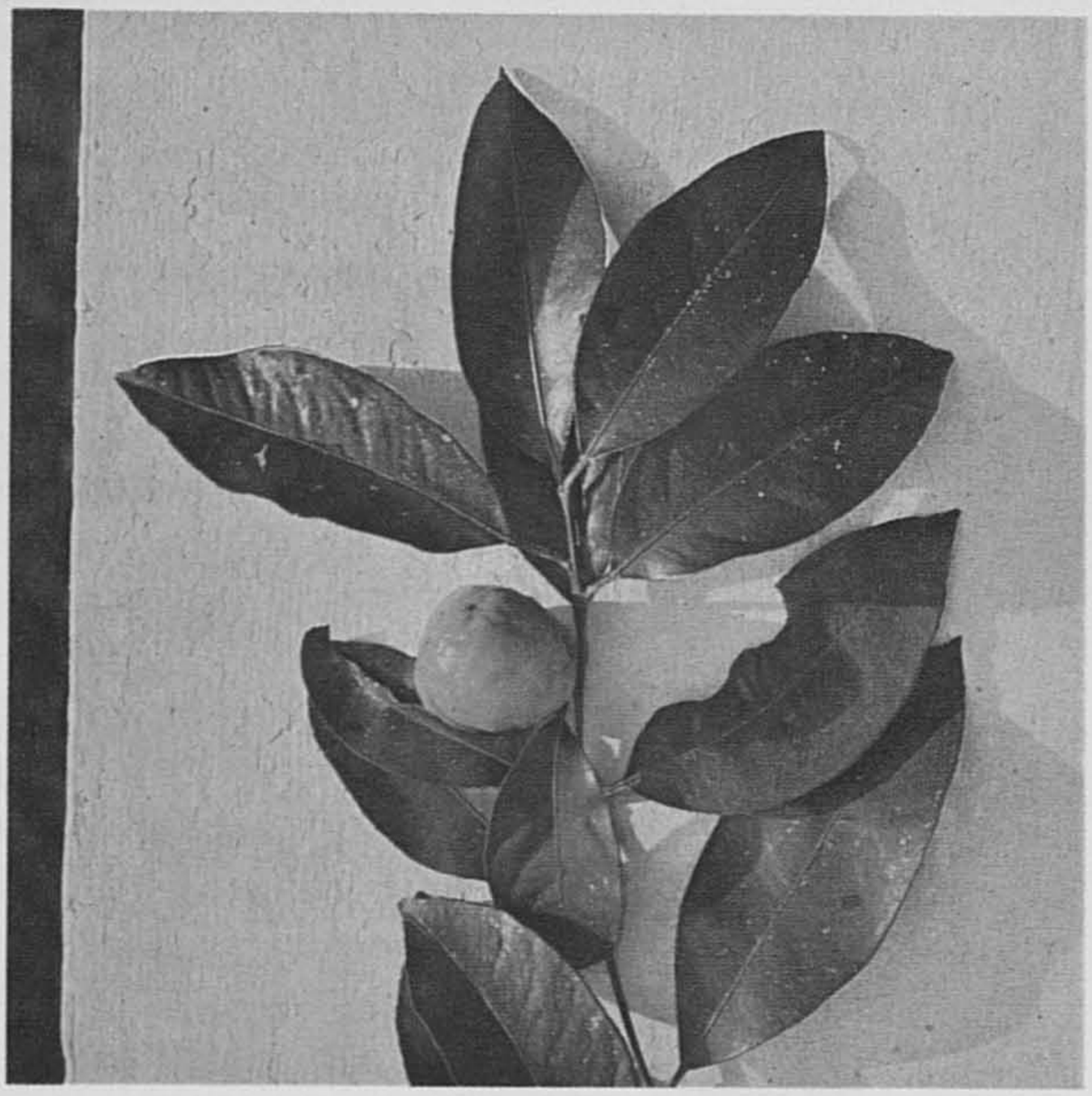


FIG. 1. *Citrus halimii*, a leafy branch showing upper leaf surfaces and a fruit.

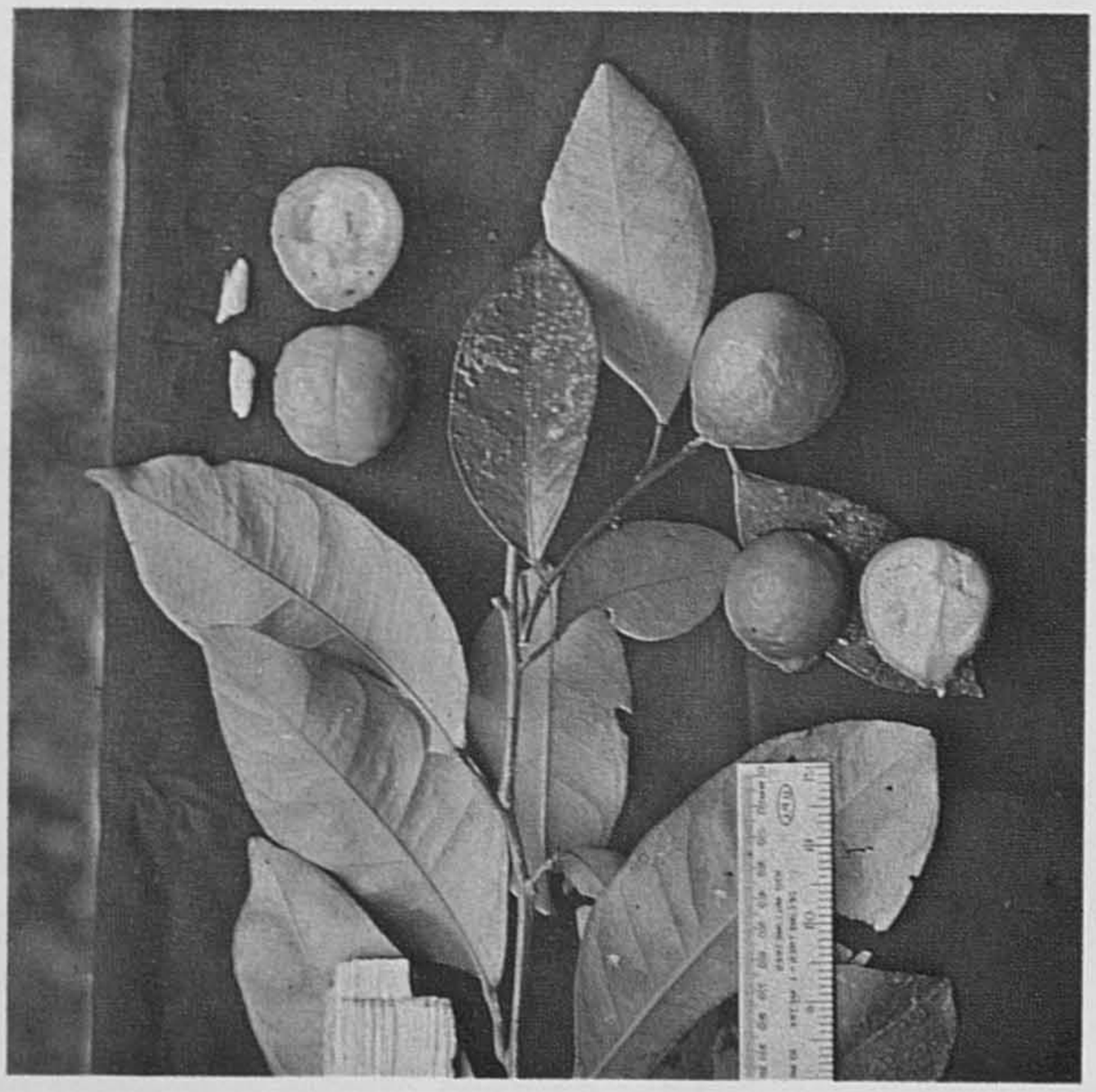


FIG. 2. *Citrus halimii*, leafy branch showing leaf under-surfaces and several whole and sectioned fruits. (Scale: in cm and inches).

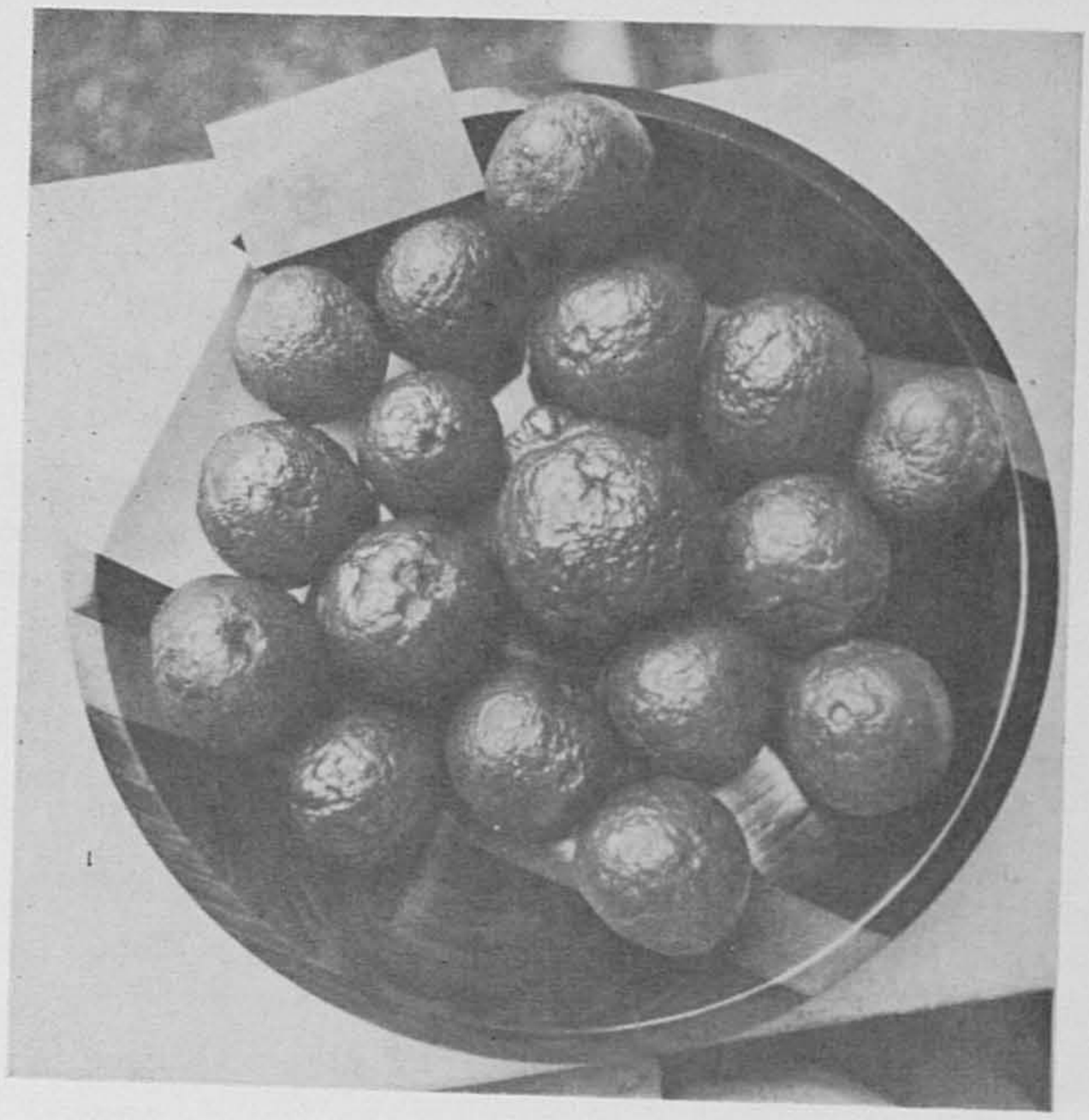


FIG. 3. *Citrus halimii*, a bowlful of fruits.

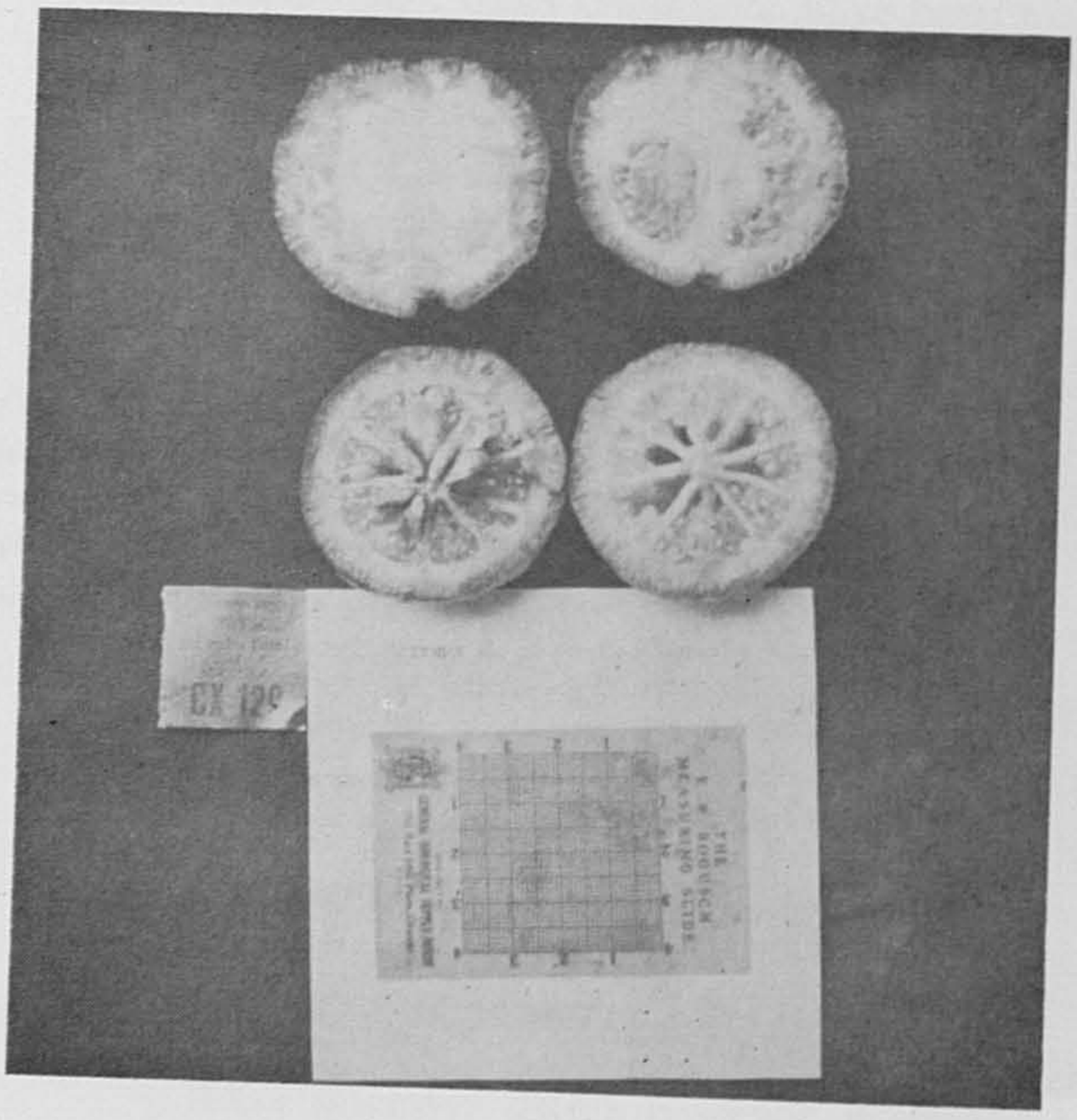


FIG. 4. *Citrus halimii*, fruits showing sectional views and seeds.

The morphological features of these plants do not conform to any other known *Citrus;* and the ecological data indicated without question that this was a native species. Seeking yet further data, a colleague at the University of Malaya, Dr. J. B. Lowry, investigated the chemistry of the fruit. His data showed an apparently unique combination of chemical features; very low fraction of flavanones; and the absence of eriocitrin (a compound characteristic of the true lemon, which to some extent resembles species 'A').

All these considerations lead to one conclusion: *Citrus* species 'A' is a truly wild, undescribed and hitherto unnamed species. The writer has chosen the name *Citrus halimii* for this splendid plant, in honour of Malaysia's Ruler, the Yang di-Pertuan Agong, who is also Sultan of Kedah. The leaves and fruits are shown in *Plates 1–4.*

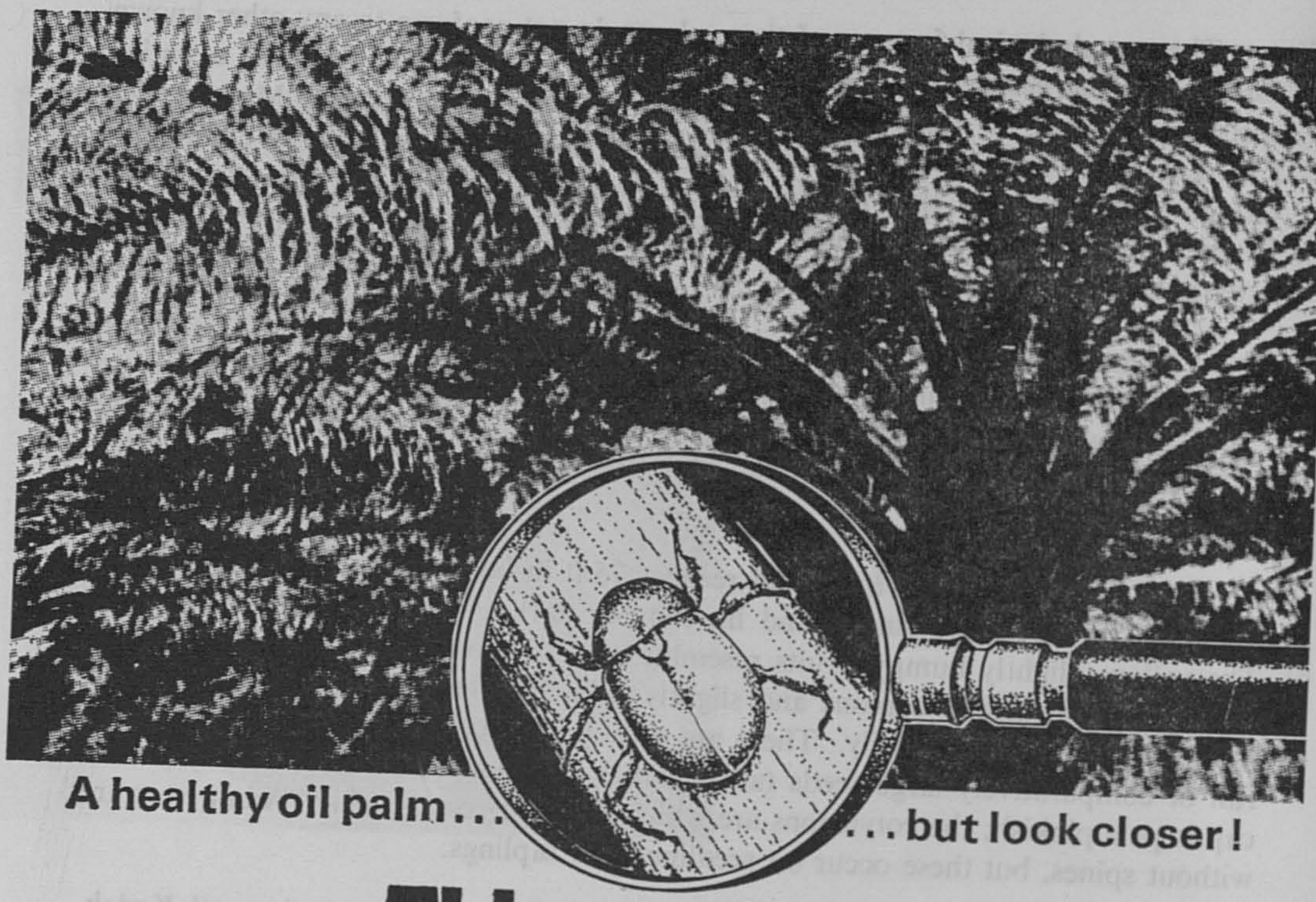
It is a big tree for a *Citrus,* and reaches 75 ft in height and a girth of over 1 m (39 in.) The leaves are simple and have much darker upper than lower surfaces. The yellow, slightly bumpy, fruits resemble rough lemons, but the flavour is quite different. The juice is copious and slightly acid, but the pulp-sacs are strong and the juice does not flow easily. There are mostly 9–10 cells in the fruit, each rather full of comparatively large seeds (all of which are monoembryonic). The chalazal cap is pale pinkish; the cotyledons are white; the seed-coat is veiny. Adult trees are without spines, but these occur on seedlings and saplings.

Definitely known localities in Malaya are as follows: Ulu Muda, in north Kedah, at 2 100 ft alt.; Gunong Romok, Slim Hills, in Perak, 2 300 ft alt.; Gua Peningat at 1 300 ft in Pahang; Ulu Sungei Wi, 3 500 ft alt., in Pahang; Genting Sempah, 3 000 ft, Pahang; Bertam road to Cameron Highlands, at 3 500 ft, Pahang; and Gunong Nuang, about 4 000 ft alt., Pahang.

Dr. Kwiton Jong of the University of Aberdeen, recently a visiting lecturer in the University of Malaya, has determined that the chromosome number of root-tip cells is $2n=18$. This corresponds to most of the known species of *Citrus.*

A full formal botanical description of the species will appear elsewhere.

What is the future of this new *Citrus*? It is not a table fruit, but Dr. Lowry has made marmalade from the fruits and pronounced it delicious. It has the major advantage of already being native and is thus well-adapted to its own environmental niche in Malaya. A research programme, to evaluate not only *Citrus halimii* but other Malayan Rutaceae, is being developed. About a dozen seedlings are now in the Botanic Gardens, University of Malaya. Who can say what the value of this plant will be? But whether it remains, as it already is, of great scientific interest, or whether it also can play a minor or significant role in *Citrus* agriculture, it is one more proof that Malaysian plants are far from fully known. While primary forests remain there also remain chances that future discoveries of other species may be as significant and exciting as this one.



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Planter, Kuala Lumpur **48:** 93–99 (1972)

Developments in oil palm pest management, 1965-71

by

B. J. Wood *

In 1965 I wrote a short account of the commoner insect pests of oil palms for the Johore Planters' Association annual report. This invitation by the Selangor Association provides an opportunity to review progress since that time, describe some areas where research is currently taking place, and consider some of the presently outstanding problems.

Throughout, the strong emphasis on the ecological approach has been continued. We have considered the principles of pest occurrence to be just as important as are detailed studies of the pest themselves. The aim has been to develop a view of the crop and the organisms associated with it as an interacting whole (the agroecosystem). Control is thought of as a regulatory rather than simply a destructive process, which takes into account the fact that any action to change the numbers of one member of the fauna may have repercussions in some far from obvious direction. This type of approach is known as pest management, or integrated control.

The insect pests of greatest concern in 1965 were leaf-eating caterpillars, in particular the bagworm *Metisa plana* and the nettle caterpillar, *Setora nitens*. To a large extent this is still true although others of the 40 or so recorded species have since, as was anticipated, occurred in major outbreaks.

Early consideration laid the blame for most of the troubles on the effect of broad-spectrum long-residual contact insecticides, due to their disrupting the natural balance between pests and the natural enemies (predators and parasites) that normally exercise control. This role of insecticides became generally recognised and accepted and there was a move away from their use as drenching foliar sprays. Some outbreaks then cleared up but others continued and damage threatened, due to further complications. These complications appeared to arise from two main causes, first, the initial pest surge, which left the enemies trailing in number, needing several generations to build up, and, second, the breakdown in the normal overlap of pest generations, so that sometimes enemies although present could not find a host suitable for attack.

Although some of the dramatic, serious and widespread outbreaks were associated with disrupting insecticides, not all infestations are thus triggered-off, and various agents have been suggested as causes. Whatever the initial trigger, there is a tendency for outbreaks, once started, to increase, spread and recur, probably from similar complicating factors to those mentioned above. To determine more precisely the nature of such triggers remains an area where more work is needed. Formal experimental work is not usually possible, and evidence tends to be circumstantial. It is thus of great value if planters will record the circumstances of outbreaks with some

* Entomologist, Chemara Research Station, Seremban.

Wasp parasites emerging from nettle caterpillars in which they have developed, killing the caterpillar. This caterpillar (*Darna* sp.) occurs on oil palms in Philippines.

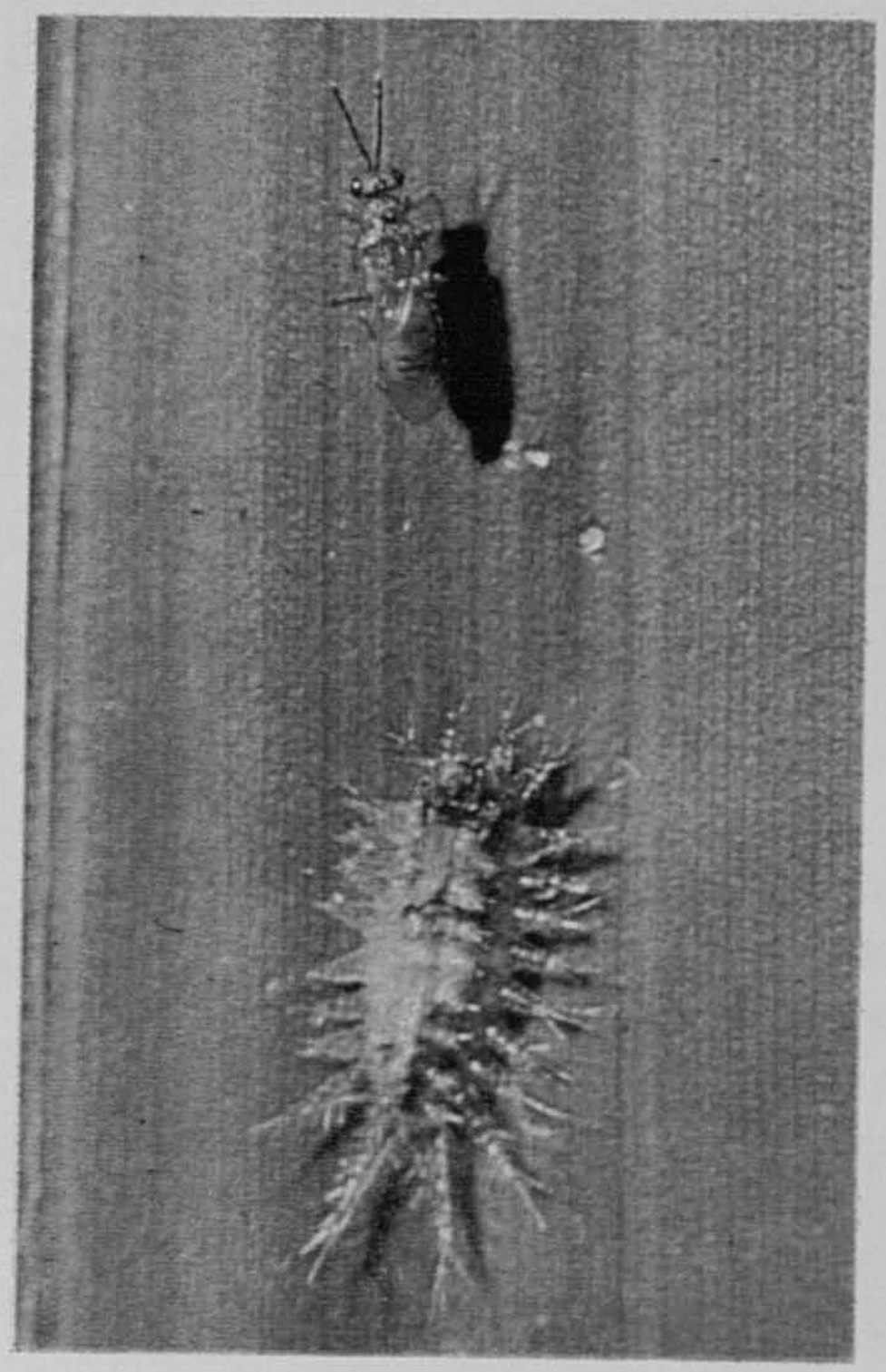


Fig. 1. A single parasite of this species develops in a young caterpillar.



Fig. 2. More than 60 individuals of this species may develop in a single older caterpillar.

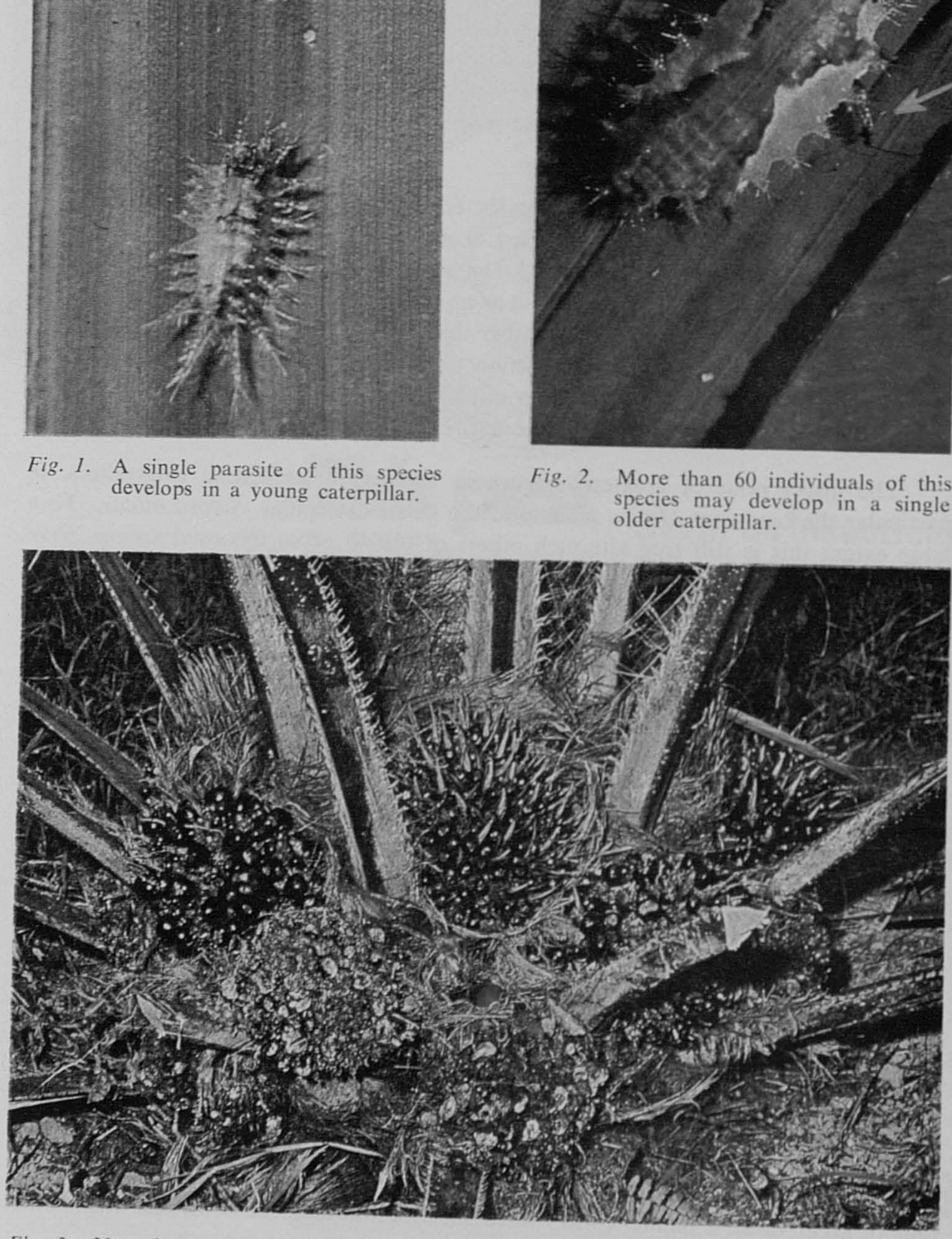


Fig. 3. Very heavy damage by *Rattus argentiventer* is seen on the lower bunches. The younger undamaged bunches grew after a rat control programme.

care. Vagiaries of the weather are a widely postulated cause. The weather in Malaya is nearly always somewhat unusual in one respect or another, so it is dangerous to infer too much from one particular outbreak. "Dry periods" and "wet periods" are commonly associated with attacks, but the evidence is often less clear-cut when other outbreaks of the same pest are taken into account. The state of the crop may be a major influence—thus risk of leaf-eating caterpillars seems to be higher at about the time palms start to make contact, perhaps because of a change in the intimate climate conditions within the crop, or because pests with poor adult dispersal have a sudden increase in their opportunity for spread. Most triggers appear to work indirectly by affecting the balance between the pest and its enemies at some critical stage.

Whatever the cause of an outbreak, it has been accepted that the best hope of restoring the original situation is a selective chemical which kills the pest but, relatively, spares the enemies. Lead arsenate, a stomach poison, was used in the early stages, but trichlorphon (Dipterex), a contact insecticide with rapidly dissipating residues, has since gained wide acceptance.

Methods of applying chemicals continue to pose problems. Shoulder-mounted mist-blowers give good coverage on young palms, but cannot reach the necessary height once the palms are more than 5 or 6 years old. The terrain is often unsuitable for tractors with power sprayers, and on such ground, in older palms, there is no really suitable application method for smaller areas. This is not generally a serious matter because the philosophy of control rather inclines against spraying small patches anyway. For bigger acreages an aerial spraying technique has been developed successfully. Several campaigns over areas up to 3 000 acres each have been carried out and in virtually all cases, good control has not been followed by resurgence. Thus, in time, most of the areas affected by the original induced outbreaks have returned to the well-balanced effectively pest-free situation.

Selectivity is only a relative attribute in an insecticide. Too early resort even to selective chemicals, or their frequent use, cannot be recommended. Nor is there even any short-term advantage in doing this since it is generally just as easy to control a severe outbreak as a light one. The census system that has evolved permits reasonable monitoring of an infestation, so that the intensity and speed of increase can be followed. Spraying can be held back until the infestation merits it, but done before substantial damage occurs. The decision and the timing of the spray is thus made relatively easy.

In countries around West Malaysia, some similar events have occurred. DDT dusting in Sumatra has been associated with recurrent outbreaks of the same pests, with widespread damage. The possibility of utilising selective measures is now being looked at. In recent oil palm ventures in the Philippines, a nettle caterpillar from coconuts has broken out sporadically. Largely by analogy, this seems to be associated with disturbances to natural balance from one cause or another, and heavy parasitization may occur, rendering treatment unnecessary in some fields. It will be interesting to see how the situation settles. A recent visit gave me the chance of some lucky shots of parasites emerging (*Figs 1 and 2*). Some oil palms estates in Sabah

have been grown without major insect problems, but in recent years others have had major infestations, whose original trigger cannot be elucidated. The bagworm *Mahasena corbetti* has devastated large acreages, but aerial spray with trichlorphon has been successful. Parasites are now common and resurgence does not usually occur after a spray. This bagworm has a vast increase potential (around 4 000 eggs per female) and yet, although it is quite common in West Malaysia, no outbreak has ever occurred here. Nettle caterpillars, in particular *Darna trima* and *Setora nitens*, are now of frequent occurrence in Sabah. Currently, the biological factors in the control of these pests are being investigated by the local sub-station of the Commonwealth Institute of Biological Control.

The outbreaks in West Malaysia, together with a rather similar series of events on cocoa in Sabah, dealt with and critically interpreted by Gordon Conway,* have become more widely known because they have helped to illustrate some principles of biological control, in particular the great importance of naturally occurring biological factors in regulating potential pests in the fairly stable environment provided by perennial crops in the wet tropics. Sporadic insect pest attacks are characteristic, and can be worsened by wrongly-contrived attempts at control. It is also clear that we are not helpless to adopt integrated control measures in the absence of knowledge of every last detail of the workings of the agroecosystem. We must apply the most rational methods possible in the light of information to hand, and at the same time increase our knowledge by critical assessment of and (where possible) experimentation in the situation that requires the action. The more we know, of course, the sounder will be the approach, and a more solid base is developing in oil palms. An important part of the current research endeavour aims to elucidate further details of the biology and ecology of the enemies in relation to the pests.

The search for additional selective chemicals continues whenever an outbreak presents the opportunity. Once the decision is made to use a chemical a high kill is desirable, but susceptibility among the leaf-eating caterpillars to trichlorphon and lead arsenate varies. The former was the general recommendation until recently but a species of nettle caterpillar, *Thosea bisura*, reaching outbreak proportions for the first time, was very resistant. Without prejudicing further elucidation of the results of recent trials, endosulphan (Thiodan) and tetrachlorvinphos (Gardona) are chemicals of promise, which on theoretical grounds might be selective in palms, and so become additional weapons in our armoury against this group of pests.

The bunch moth, *Tirathaba mundella*, was mentioned in 1965 as an increasing problem, and since then it has been frequently recorded at outbreak levels. New plantings on former rubber land seem especially susceptible. Since young palms on established palm estates are not widely affected, it may be that these upsurges occur before any natural enemy population is established in the area. However this question is an important one still not satisfactorily answered. A wide range of chemicals has been tested and found effective, and some are used in practice. Endosulphan is widely preferred on account of its selective properties and effectiveness at low dosage, and there is no report of resurgence after its use. Other chemicals have also been used effectively, without side-effects.

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* Sabah Entomologist from 1960–1965.

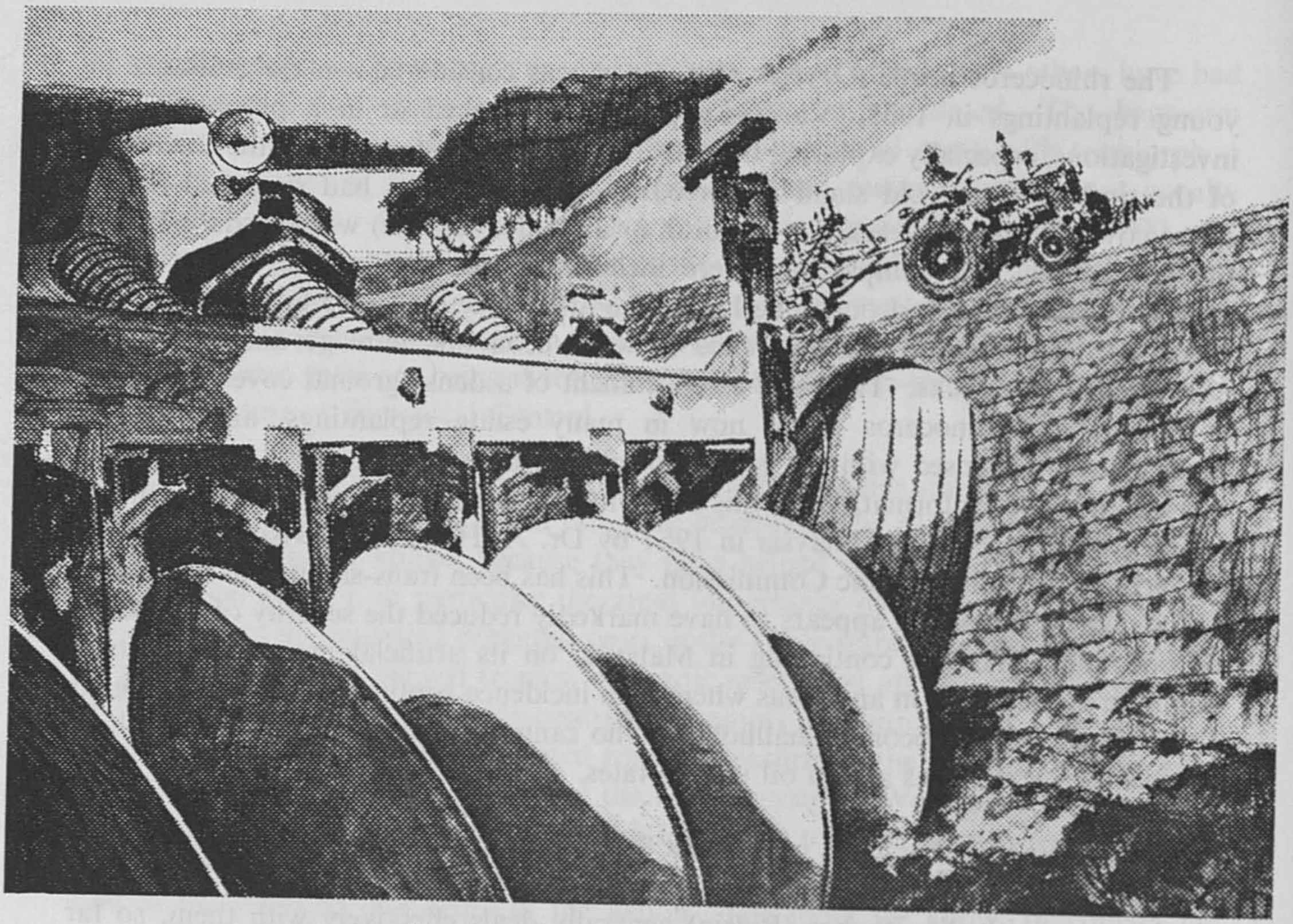
The rhinoceros beetle (*Oryctes rhinoceros*) was considered a major nuisance in young replantings in 1965. Various aspects were looked at in a programme of investigations, especially exploring the possibility of reducing some way the suitability of the timbers of the old stand for breeding. Some planters had supposed that a dense cover of ground-vegetation (natural, or a planted legume) would reduce breeding and attack, and comparisons were included in the programme, to get some objective data. It turned out to be by far the most effective single factor tested. So much so, that it made the difference between economic damage and occasional easily-tolerated attacks. The early establishment of a dense ground cover is all that is done about rhinoceros beetle now in many estate replantings, and periodic inspection is dispensed with. It is still not certain how the vegetative barrier effect works, and more information on this is obviously desirable. A virus disease of the grubs was discovered in Malaysia in 1964 by Dr. A. Huger, who visited under the auspices of the South Pacific Commission. This has been trans-shipped to the Pacific islands where initially it appears to have markedly reduced the severity of the beetle on coconuts. Work is continuing in Malaysia on its artificial propagation, which might be of help both in any areas where high incidence continues despite the ground cover effect, and to coconut smallholders who cannot exercise the same far-reaching control over conditions as can oil palm estates.

Some progress has been made with other more minor pests. Leaf-eating cockchafers and grasshoppers sometimes do severe damage to immature palms, but a single spray with dicrotophes (Bidrin) generally deals effectively with them, so far without repercussions. Root-feeding cockchafers, previously associated with rubber at certain forest margins, have attacked palms in a few localities, some hundreds of acres being severely set-back. An extensive trial is currently in progress to determine the short-and-long-term effects of various possible control measures, whilst work by B. S. Rao on the cockchafers in rubber has stood us in good stead in planning immediate action. Oddly, rotavating the soil seems markedly to reduce the numbers of the pest—this is further improved by adding insecticides, but rotavating by itself was better than any broadcast or watered-in chemical alone.

Nursery pests have not increased in importance. Occasional red spider outbreaks are controlled with specific chemicals, caterpillar outbreaks are rare now that broad spectrum contact chemicals are avoided, and various other potential pests have not developed, or, like crickets which were a minor problem in nursery raised beds, have effectively disappeared as a result of changes in planting practice.

The subject of the 1965 article was "insect pests" and I could have said little at that time about vertebrates, in particular rats, that was not well known to all planters; *i.e.* that they existed in most oil palm areas and did substantial damage. Since that time there has been opportunity to develop some objective standards to assess populations and devise effective control measures.

Rattus tiomanicus, the Malaysian wood rat, is the major chronic problem. Catch, mark, release, and recapture techniques proved a very powerful tool in studying this relatively easily-trapped rat. Because it does not move far within short periods, a Lincoln index technique was possible to make assessments of actual



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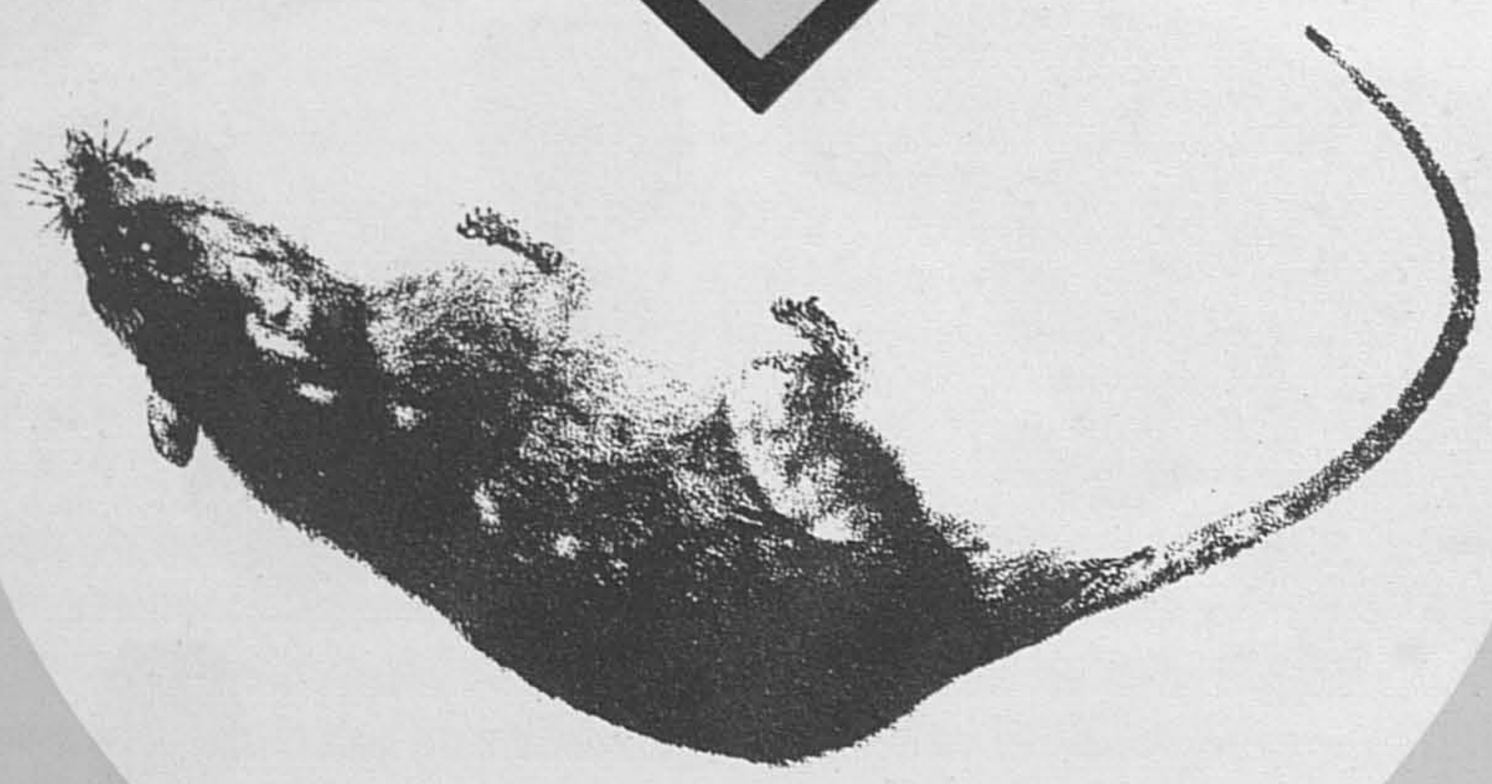
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numbers. The way this works can be likened to sample counting of, say, beans in a jar. A handful are removed, counted, marked and remixed in the jar. Another handful is then removed and the proportion of marked ones in that corresponds to the proportion of the first handful to the total in the jar. Rats are caught and marked for a few nights in a plot usually of about 1 acre, and marking is done by serial toe clipping (which permits later recognition of individuals, itself a factor of great importance to population studies). This corresponds to the first handful of beans. The second "handful" is obtained by hunting through the plot (using a different catch technique, we are not biased to only estimate the more easily trappable rats and, incidentally, we obtain a stock of dead rats for studies).

Thus the following simple equation gives a good estimate of the population, providing a reasonable number are caught by each method: —

$$\frac{\text{Number caught in traps (released)} \times \text{number caught by hunting}}{\text{Number of those caught by hunting that were also caught in traps}}$$

Such work done in many parts of Malaysia has demonstrated that populations of 100–150 per acre and more are common. Damage was indirectly estimated at $26.00 by multiplying the populations size by the amount eaten in captivity, and taking an oil price of $400.00. There are various reasons for supposing this to be a minimum estimate.

Parallel work on bait acceptance showed that there were several formulae that greatly improved on the rice bran-based baits previously in use. Eventually one using a maize base, with supplements, was chosen, prepared in paraffin-wax-bound cubes. The anticoagulant poison, warfarin, which produces no bait shyness (generally) was employed. The population studies showed that practically 100% elimination of rats was possible, and incidentally demonstrated that some older methods—the use of barium carbonate on fruit, trapping and hunting—were of little value. Continuing studies showed that it was six months or more after baiting before the rat population *began* to re-establish. Surprisingly, there seems to be a steady rate of increase rather than a sudden spurt and the increasing population does not "overshoot" the normal settled one. This work goes on and it is hoped to throw further light on the reasons for the slow increase and other factors.

Baiting technique is critical, especially the replacement of taken baits at about 4-day intervals until acceptance is low. Studies on reinfestation indicate that the main source is from already infested palms, so a policy of baiting whole estates at one time is preferable, tackling this block by block. The situation is very different from that of the well-studied brown rat (*R. norvegicus*) in temperate countries, which tends to infest discrete areas such as buildings where there is constant reinfestation, and the making of direct analogy between the two carries a considerable risk of wrong conclusions. Nonetheless, it is frequently done.



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Research on the wood rat continues to improve our chances of dealing with new eventualities. Resistance of one form or another is likely at some future date, but what form it will take and how best it can be dealt with remain to be seen. What is certain is that ineffective or partial control are mostly likely to speed its onset.

An interesting event was the discovery of another species of rat *R. argentiventer*—more usually found as a ricefield pest, in young fruiting palms in places as far apart as Klang and Central Johore. Damage from this pest can be so intense as to virtually halt production (*Fig 3*). It is a little larger than the wood rat, with a silvery rather than white belly. Other differences are that it burrows (the wood rat nests in palms or under frond piles), is a less adept climber, seems to have a more voracious appetite and can probably build up to bigger numbers. The latter point is rather difficult to establish with certainty because it is less easily trapped then the wood rat. Control is, if anything, easier, but obviously more expensive because of the large number of baits needed.

In accordance with the ecological approach, side effects of rat control are looked for, but none are recorded yet. Among possibilities are changes in the population of a pest on which the rats prey, for example snails, or replacement of rats by a competitor that is less easily baited. Squirrels are being carefully watched in this regard. Other vertebrates, in particular birds and large mammals, are known as pests, but although some preliminary work has been done, no active studies are in progress at present, so far as I know, although they would be advantageous. Some planters feel that the long-tailed parakeet causes economic damage at times.

"Damage thresholds": the point at which losses become of economic significance, need to be examined for most pests. This is not a simple matter, because the cost of control in different ways, and possible side-effects of control, have to be brought into consideration. With most pests, estimation of what is likely to happen—whether the situation may dramatically worsen, or improve, is all-important in control decisions. No set of rules on the basis that a particular size of population requires control, is likely alone to give the degree of flexibility required, although a relationship between pest numbers and likely damage can be a useful guide. Experimentation to establish correlations is in progress, but in a limited way in particular areas. This is another aspect in which more wide-ranging investigations would be useful.

In conclusion it can be said that the oil palm estate represents an environment where, with proper pest management, there should be few if any intractable or excessively expensive pest problems. On the other hand, the continuingly favourable conditions can permit devastating attack. The gradual increase in our knowledge of the pests, and the more detailed understanding of those natural factors involved in regulating their numbers is gradually strengthening our position against them.

Acknowledgements. I am grateful to Kumpulan Guthrie Sendirian Berhad for permission to publish this article.

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BIBLIOGRAPHY

Formal references have been omitted in this article, written for general readership. Those interested in more detailed information are referred to: —

WOOD, BRIAN J. (1968). *Pests of oil palms in Malaysia and their control.* Kuala Lumpur: Incorporated Society of Planters, pp. i–xvi, 1–204.

WOOD, BRIAN J. (1969c). Population studies on the Malaysian wood rat (*Rattus tiomanicus*) in oil palms, demonstrating an effective new control method and assessing some older ones. *Planter,* **45** (10), 510–526.

PAPERS BY VARIOUS AUTHORS in the pest section of *Crop Protection in Malaysia,* the proceedings of the crop protection conference organised by I.S.P., October, 1970.

(Reprinted, but with colour plates, from the 1971 Annual Report of the Selangor Planters' Association, to whom acknowledgement is made).

Book review:

Plant protection chemicals available in Malaysia.

B. J. Wood, Chemara Advisory Service, Seremban, 1971.
Price M$2.50

Mr Wood is to be complimented on the production of a most useful booklet, which lists all the plant protection chemicals—herbicides, fungicides and insecticides—currently available in West Malaysia. Nothing quite as comprehensive as this list has appeared before, and it is strongly recommended to every planter, advisory officer and others connected with plantation agriculture—in fact to anyone who from time to time has a problem in the field of plant protection for which a chemical is required.

A key is supplied to accepted common names as well as to manufacturers' and trade names, and full addresses of local suppliers are given. In addition a simple assessment of the mammalian toxicity of the active ingredient is given, and a brief sketch of the uses to which the product may be put. In a compilation of this size the latter information must of necessity be too brief to be really useful, and the main use of the booklet will be as a source of reference to the availability of specific products.

A particularly useful point is that products immediately available in commercial amounts are indicated by an asterisk. Rightly, no mention is made of price since this can change rapidly and varies according to the quantity purchased. A large body of information has nevertheless been packed into a handy and inexpensive form. Another first for Chemara!

R. L. W.


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The monthly crop

Well, that was a very enjoyable annual luncheon at Commonwealth House in Kuala Lumpur on 15 April. Informal compared with previous years, the occasion nevertheless was highlighted by the presentation to Mr Gordon McCulloch of the award and designation of Fellow of the Society; a trenchant exhortation by Dr B C Sekhar, Director of the Rubber Research Institute of Malaya; and a series of choice post-prandial anecdotes from Professor A A Sandosham, Secretary of the Malaysian Branch of the Royal Commonwealth Society. Impressed by the facilities afforded by the RCS, fifteen ISP members joined the royal society on the spot, and more will no doubt follow. In listing the amenities available Prof Sandosham forgot to mention the excellent accommodation at Royal Commonwealth House which is cheaper, and better in the writer's opinion, than any comparable place in London.

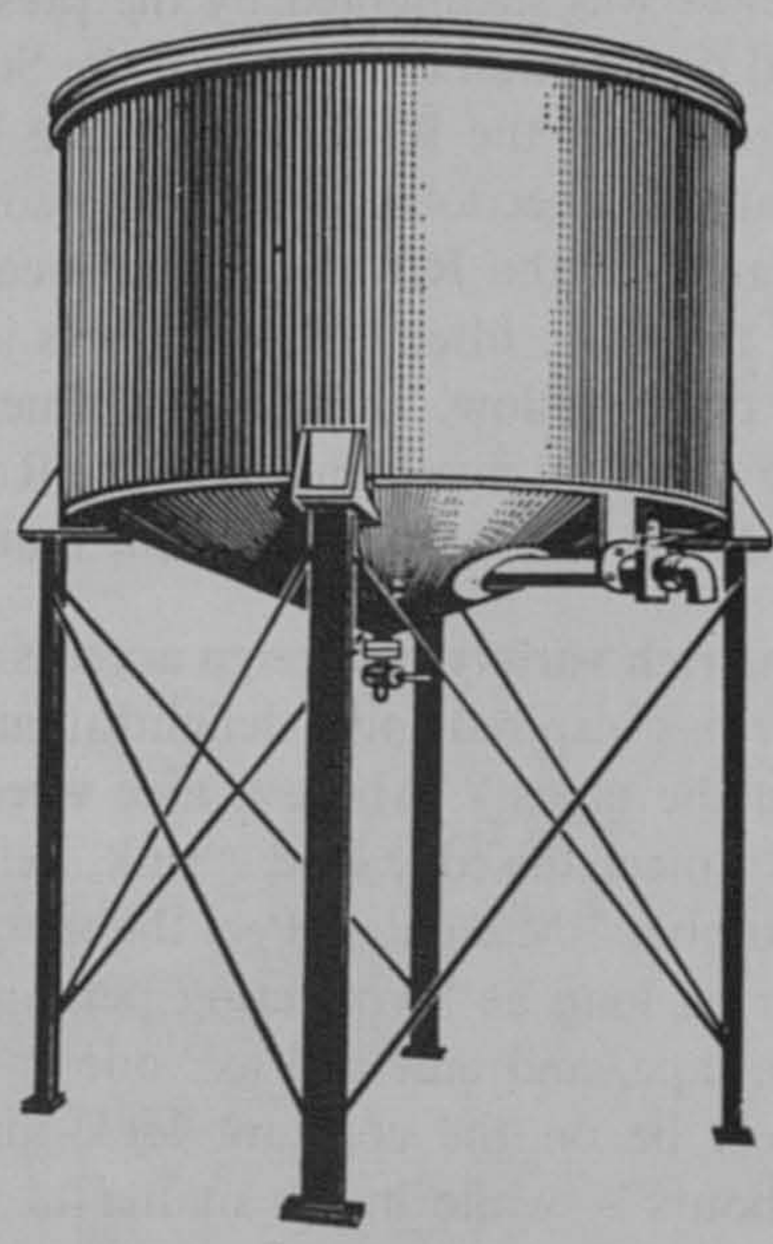
The rich variety of foreign accents at the Cocoa & Coconuts Conference last November has inspired some delightful guesses by the good people currently busy transcribing the tapes. "Make a nice weeding policy" is we feel, infinitely to be preferred to "mechanised", and "sink deficiency" might have come straight out of the Plumbers' Manual. "Peel the merge herbicide" had us stumped for a while, but not for as long as "wondering perhaps the nursery" which had to be found again on the tape, and emerged as "one is perhaps at the mercy". And then cocoa planters must be on the constant look-out for "swivelbeans"—especially those with "off-labours"—while in the matter of establishing quality standards for cocoa, did you know that "manufacturers are ceasing every opportunity"?

In a note received from Miss Eileen Shotton, the outgoing Principal of Uplands School, she writes:

> "If the rest of the world could integrate as happily and readily as our children do at Uplands there would be little future fear of the turbulence which prevails in the four corners of the earth at present. Our academic standards are high; in spite of considerable differences in ability, culture and background, each and every child is well up to standard when they eventually move on to their next school. The earlier we get children whose mother tongue is not English, the better. As a gentle introduction to boarding school life, prior to entry in the more formal, rugged Public Schools abroad, Uplands is ideal. The Staff know the children as individuals, their families, their worries, their loves, their hates.
>
> What would happen to all these children should it ever be decided to close Uplands? The pleasure children give parents in their early years, is far too precious for most people to want to part with their young any earlier than is absolutely necessary. How many would be prepared to send them to boarding school, in say England, aged five?
>
> As I leave Uplands may I appeal to those concerned to do all in their power to keep the school going? There is no reason at all, financial or otherwise, why it should not."

We hope that many will heed Miss Shotton's appeal, and in thanking her for her splendid services to Uplands, we wish her every happiness and success in her future.

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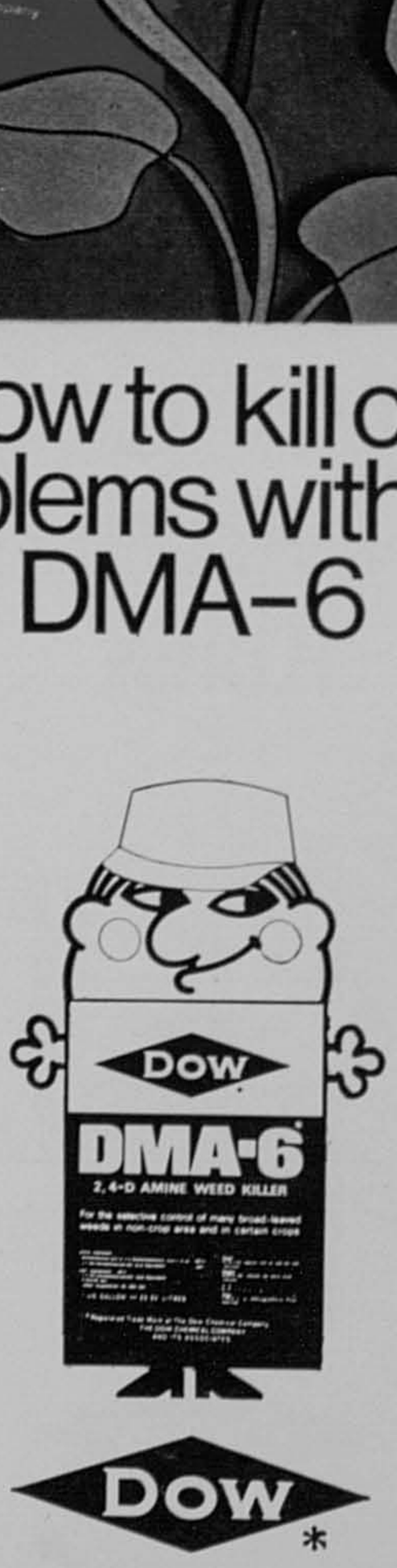
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DMA-6 with DOWPON-S, MSMA 529 and water is fatal to tough and hardy grasses. Just spray on the foliage and watch your problem wither away. DMA-6 is non-poisonous and non-toxic to your crops and animals. And a hint from the doctor from Dow. For economical application use either the 5 or 55 US gallon drum of DMA-6. DMA-6, another example of Dow's commitment to making your profit grow through agricultural science.

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Revised examination dates for Agricultural Science and Estate Practice will be found on the front page of the Supplement to this issue. Candidates who had already registered have been written to.

The Editor will be on overseas leave until mid-June. Authors and contributors with any problems may consult any of the gentlemen listed under Editorial Committee. Advertising matters may be referred to the Assistant Secretary, Mr K S Lim.

Members in Sabah are keen for the Society to have its own car badge, and this matter was bandied about at the annual general meeting. Will branches who find the idea attractive please let us know? The question of design, cost etc can then be gone into. Such a badge would not be a *club* emblem since sadly, the ISP Car Club has been wound up and de-registered.

A Harlequin Great Dane aged only 18 months needs a good home. He is available free through the SPCA (Tel KL 64142) but the present owner will retain the dog's papers. Please mention *The Planter* if you enquire about this noble beast.

Black humour, or "sick" humour as some call it, has its devotees. We prefer the milder (?) kind of more than half a century ago. In his *Ruthless Rhymes,* the author Harry Graham has the following:

> I had written to Aunt Maud
> Who was on a trip abroad,
> When I heard she'd died of cramp
> Just too late to save the stamp.

Highlands Estate
P O Box 203
Klang
Selangor

23 April 1972

D A Earp Esq
The Executive Secretary
I S P
P O Box 262
Kuala Lumpur

Dear Sir,

Please convey to all members of the Society my appreciation of the award of Fellow of the Society.

As I said in my acceptance speech, I would like to accept the award as a measure of the gratitude of Society members to all those who do so much for the Society. That I should be singled out is my good fortune. I just happened to be "leader" for a while and probably collected a disproportionate share of the credit.

I look forward to contribute to the progress of the Society as far as my other considerable commitments will permit.

Yours faithfully
(*Sgd*) G C McCulloch FISP



The Queen and Prince Philip meet Uplands School children during the royal visit to Penang Hill, 8 March, 1972.



Photographs by The Sun *newspaper*

Queen Elizabeth II visits Penang Hill

On Wednesday, 8th March all the children of Uplands School had breakfast then went to their dorms. After a while a bell rang and we went up to the "Lookout" to see *H.M.Y. Britannia.* We saw the yacht in front of four small craft and a Frigate which was escorting her. When it reached port a loud horn went off but there was no twenty one gun salute or National Anthem.

After lunch we dressed in our walking out uniform, the ones we go home in. We walked to the Top Station and went to our places, behind the railings, to wait for the Queen and Prince Philip to come off the train. Most of us had three flags, one Malaysian, one Penang State flag and one Union Jack. While we were waiting we saw a man fast asleep.

When the Queen stepped out of the train, Jeffrey Middleton shouted "Long Live the Queen", then he shouted "Hip Hip" and we shouted "Hurray". Jeffrey shouted "Hip Hip" three times, and we shouted "Hurray" three times. The Queen was beautiful. She wore a purple dress and a nice hat with a purple band. We also saw Prince Philip and he wore a man's usual going out uniform. We all started waving our flags. Prince Philip was going to come and talk to us but we were so excited we waved the flags too close to his face and lots of us couldn't see.

When they had seen us they got into a green jeep with red carpets and white covers with dunlopillo cushions to sit on. They went to a house called "Bel Retiro" to have some tea and something to eat. When they had finished they came back to the Station.

The Queen and Prince Philip came and talked to us and this time we didn't wave our flags so hard. The Queen said "Do you come from Uplands School?" and we said "Yes Ma'am". Prince Philip asked how many girls there were at our school, but we didn't know. They chatted for a very long time then Prince Philip said "Happy Christmas" and Queen Elizabeth said "Happy Easter". As they walked away we called out "Goodbye Ma'am Goodbye Sir". Then we came back for tea.

Neil Maclean
Minoli Salgado
Quentin Templeton
Elizabeth Gillbanks
Mary Anderson
(Grade 4: $8\frac{1}{2}$–$9\frac{1}{2}$ yrs)

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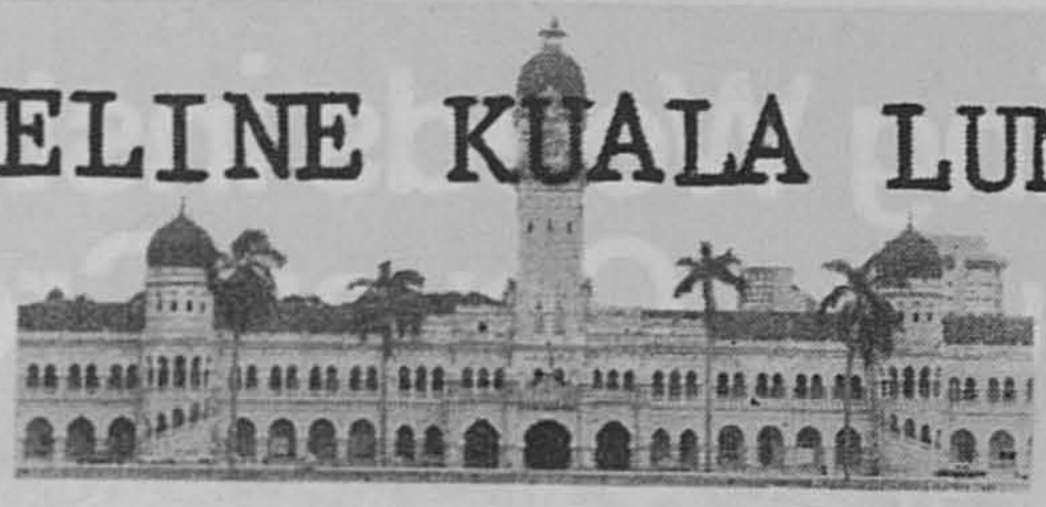
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DATELINE KUALA LUMPUR



Motor cyclists in Kuala Lumpur are an optimistic lot (they have to be, riding those two-wheelers). They have yet to give up on the love bug. It's not the film of the same name they are concerned with. Theirs is a genuine search for that rare insect Beetleus Appiness Luv. Necessity in the shape of that horrible traffic cop has appeared to test their agile wits again.

A recently instituted witch-hunt has singled out scooterists and motor cyclists for persecution. The police claim they are responsible for nearly every accident on the road and have labelled them one and all "reckless, inconsiderate and incorrigible." A traffic police chief has rather charmingly described them as opportunists.

Rather hurt by this sudden publicity and even more by the current open season, these "two-wheeled fiends" are desperate for a remedy. Hence the sudden search for Beetleus Appiness Luv, that rare bug whose bite is love.

If only a male and a female can be caught, and persuaded to breed, and all traffic policemen are bitten . . . The possibilities are infinite.

In the meantime, all that motor cyclists can do is nurse their hurt and develop paranoia. Why pick on them alone? Why not reckless bus, lorry and automobile drivers as well? Or do drivers of souped-up four-wheeled monsters never sin?

Instead of merely collaring motor cyclists, the authorities should perhaps adopt a more positive approach. The Malaysian Motor Sports Club for example included a race for Vespa scooters at the recent Malaysia Grand Prix meeting. There were 50 machines entered, and everyone had great fun tearing round the Batu Tiga circuit. An excellent way of allowing youngsters to let off steam and learn to handle their machines.

As expected, the Grand Prix made temperatures rise. Unfortunately, it wasn't the excitement of the racing which aroused so many competitors. Customs red tape held up a number of cars at the local railway station and made their owners hopping mad. These competitors needed all the time they could get to prepare their machines and to practice, and a lost day meant a great deal to them. But they were the lucky ones. A wagonload of racing cars was listed as "missing" while in transit from the Singapore Grand Prix. After some frantic hunting, the cars were located but not before a number of foreign competitors had uttered dire warnings to comrades back home about Malaysian hospitality and efficiency. Recriminations then flew thick

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and fast with even the local press taking part in the finger-pointing. The Customs assumed an angelic air. Regulations were regulations, and racing drivers, they insinuated, should perhaps learn how to read and write and fill in forms if they wanted to get anywhere. MMSC officials came under fire for not wet-nursing the drivers from abroad, and almost everyone blamed everyone else.

But it must be remembered that most MMSC officials hold regular jobs and they can only devote a little of their time to motor racing. The Malaysia Grand Prix is internationally recognised and the State Government might do well to take a greater interest in the event. The Government has a stake in the Batu Tiga circuit and it is discouraging to note that motor racing here has not received much direct Government support. So much has been said of tourism but apparently the potential of motor racing in this respect has been overlooked.

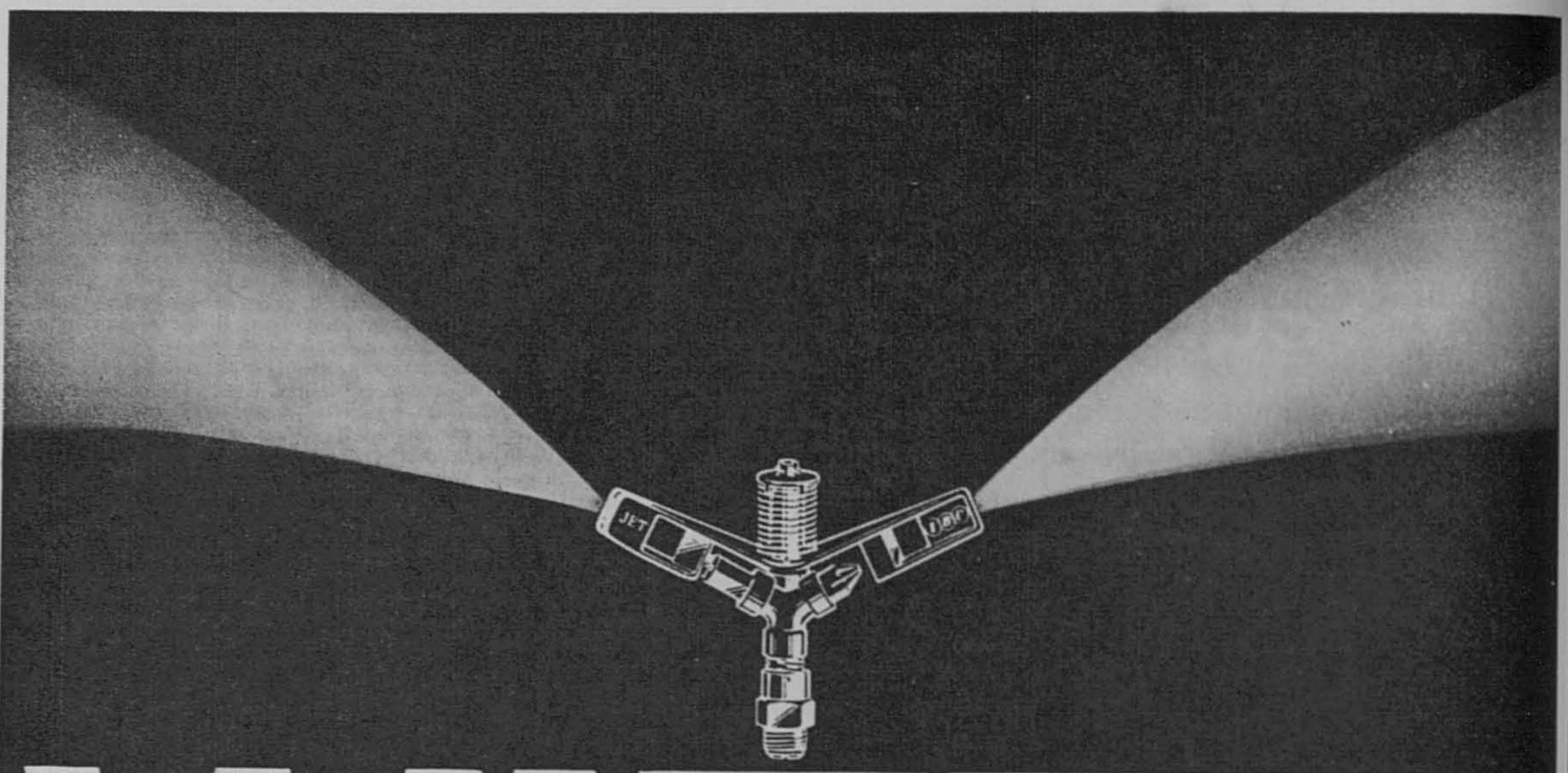
Heigh ho, and on to another hobby horse. The God of Concrete has demanded another sacrifice. The old Pudu Gaol here is to be demolished. Originally, a park was to go up in its stead. But there are disquieting rumours that a high rise building is being planned for the site. The prison is hemmed in by crowded tenements and flats and a park is the logical thing for the area. A "lung" is badly needed and no doubt a wee spot of greenery would be much appreciated by residents. Let's hope it's just another rumour and there'll not be another skyscraper to claw the skyline.

Tigers in West Malaysia might soon be confined to those we have in Zoo Negara, and that chummy feline creature gracing a certain brand of petrol. The tiger situation here and in all parts of the world is so critical that the World Wildlife Fund has decided to launch a Save the Tiger campaign here in June. But even at this late hour, Malaysians still fail to realise the importance of saving one of the country's most beautiful and striking creatures.

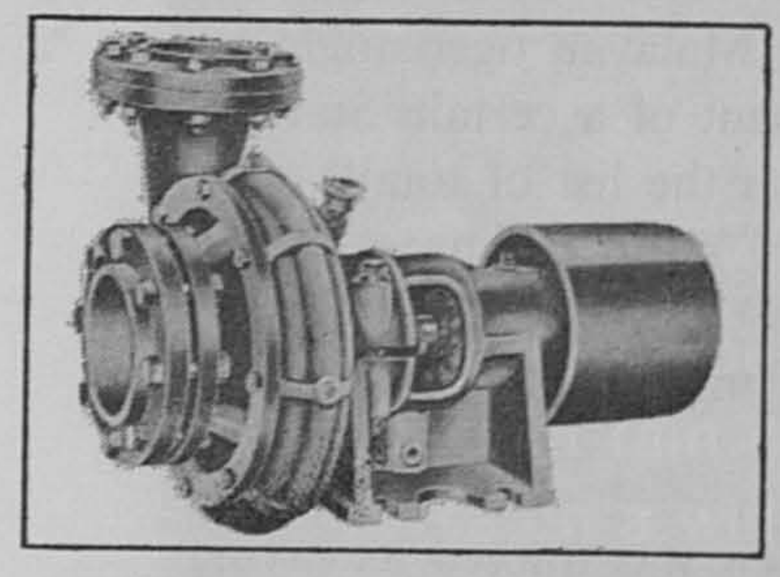
The World Wildlife Fund expressed the view that the Malayan tiger might be "facing extinction". When told of this, the game department of a certain State in Malaysia said rather coolly that "tigers *might* be placed on the list of totally protected animals". A spokesman added that most tigers were killed by snares meant for wild pigs which were ravaging crops. Ironically, as any ecologist will tell you, it is the tiger which is responsible for keeping the population of wild pigs down to reasonable levels.

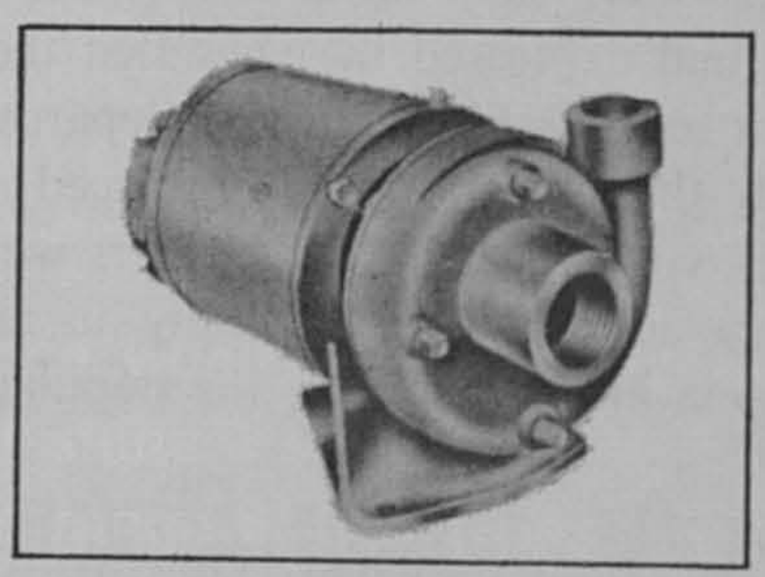
Only two years ago, the country's Chief Game Warden was quoted as saying brightly that "tigers will still exist for at least another decade in Malaysia's evergreen jungle . . ." Even worse, he is credited with saying that "the national game laws are another reason for the tiger's flourishing existence in Malaysia." And as part of the Department's service to the big cat, it "discourages" hunters from shooting them. Let's hope it's all some poor reporter's misquotes. This must be the shortest 10 years for tigers! And more food for thought: The particular report added that "other Malaysian animals which are abundant in the jungles are the elephant and the seladang."

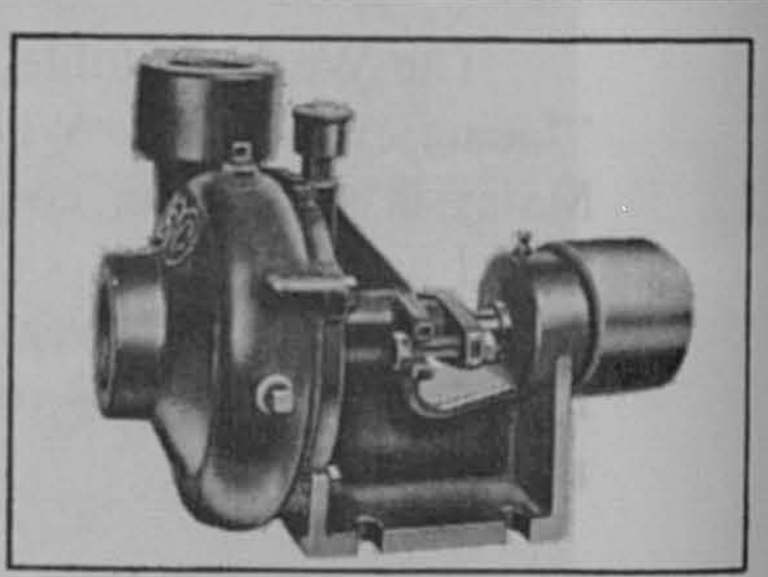
Obviously, the Wildlife Fund must have thought otherwise. An estimate of 500 tigers is already very optimistic.



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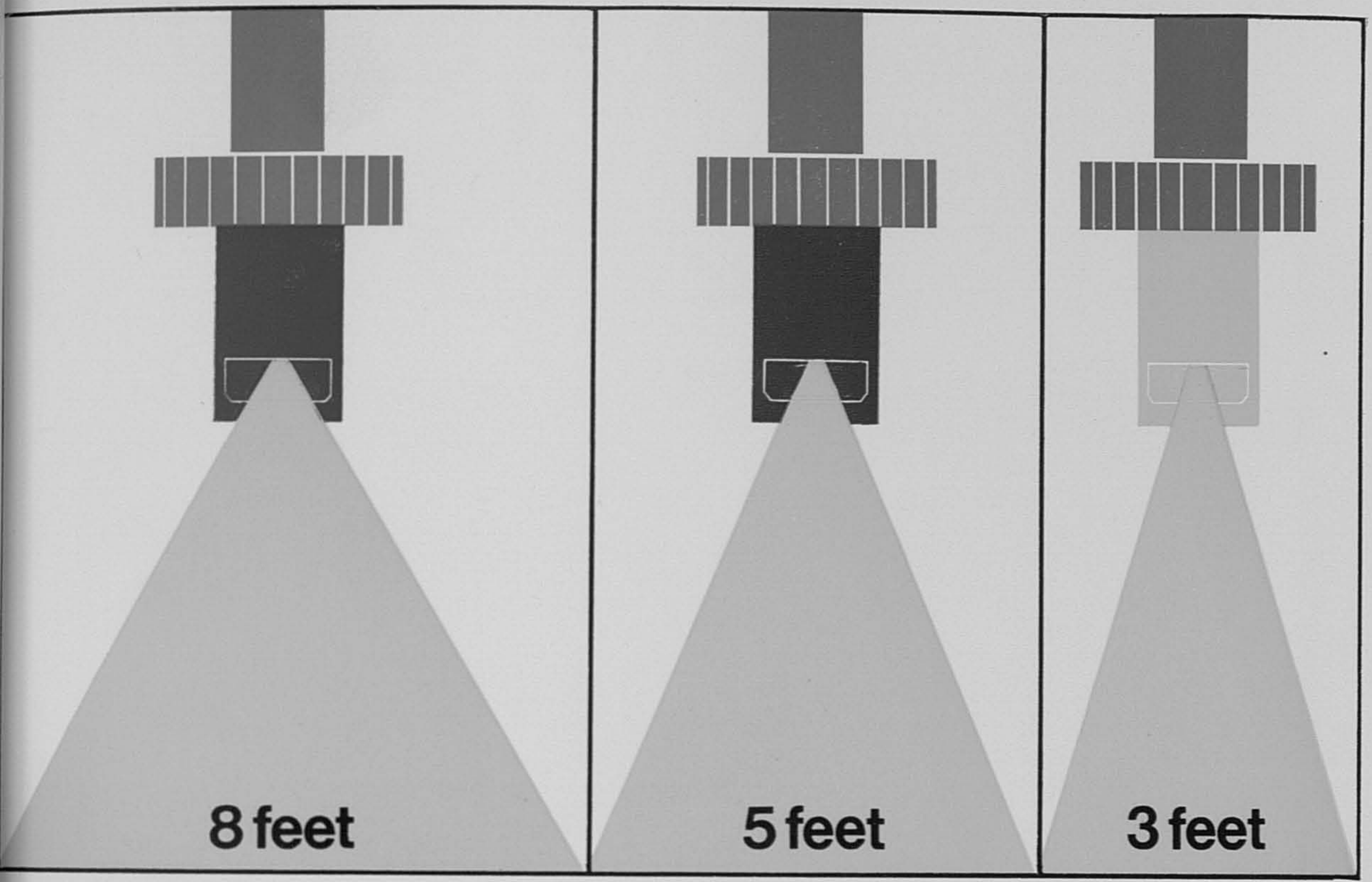
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Hats off to the brave artist who reared a tiger so that he could paint a picture entitled The Tiger's Roar. It took him 10 years to capture the Roar in powdered turquoise and 24-carat gold dust. Dedicated soul that he is, the artist brought up the tiger on opium-seasoned meat. Surely he deserves the honour of being the owner of the first feline drug addict. It couldn't have been very much of a Roar.

J. N. M.

Letters to the Editor

Chemara Agricultural Services,
Seremban.
28 March 1972.

Dear Sir,

On oil palm plantations it is a common practice to remove developing flowers from young palms in the hope of improving vegetative growth and consequently early yields. Unfortunately there is no common term; no simple, generally-accepted word to describe what is done.

'Castration' is often used, both in English and French, but is technically incorrect being associated with emasculation only. Here, immature flowers of both sexes are removed. In any case this operation can be expected to reduce fruitfulness, although it is reputed to result in a girth increment if the nutritional standard is adequate.

Another common term is 'Deflowering' which, to the agriculturalist, suggests the removal, or destruction, of flowers. It also implies maturity and, by inference, is a necessary prelude to productivity.

There are others. 'Disbudding', a horticultural term for the removal of side shoots to improve plant shape or flower form. 'Debudding' presumably similar. 'Deflorescence', 'Flower ablation', and so on; a number of words for the same thing. But which is the best one to use?

May I suggest that the ISP, in its publications and conferences, insists upon one term only. You, Sir, are responsible for choosing the one to print and the purpose of this letter is to suggest that 'deflowering' may be the most suitable word. It is English, rather than Latin; it is understood—what is 'ablation' anyway?—and it is easy to say. There is no sequence of hard consonants, no hissing 'esses'. It flows easily off the tongue and describes precisely what is done. Let us 'deflower', avoiding 'castration' and prissy words such as 'disbud'.

The Planter is authoritative on such matters and by regular usage can stabilise technical terminology. It is time that one basic word, and one word only, is used for such a normal part of estate work.

Yours faithfully,

C. J. PIGGOTT.

We tend to agree. Any dissenters?—Ed.

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Estate Practice examination (Cocoa)

PART I

Time: 3 hours

1. (a) What functions do shades perform in cocoa cultivation? (5 marks)

The role of shade covers in maintaining a satisfactory soil organic matter status, low soil temperatures and suppression of weeds was omitted from some answers.

(b) Describe your choice of low (temporary) and high (permanent) shade regimes for cocoa which is to be planted as a monocrop after rubber. Illustrate, by means of a diagram, the planting patterns/spacings you would adopt for both cocoa and the selected shade. (5 marks)

Sabah candidates would not appear to favour planting of bush legumes to provide early shading and enable planting of cocoa at an earlier stage.

2. You have the task of replanting 500 acres of rubber with cocoa in September 1973. Construct a programme of work chart from the date of ordering planting material to first harvesting of cocoa. The programme should include both dates and details of the major operations involved. Costs are not required. (20 marks)

One candidate (061) did not consider post-planting operations. Some candididates forgot to place orders for planting material. Timings of operations in some instances were unsuitable and insufficient details were provided of major operations.

3. Provide particulars of the planting materials you would order, their source and estimated annual yields until the fifth year of bearing. (10 marks)

Two candidates did not provide estimates of annual yields and one was clearly unfamiliar with the identities of planting materials available to the industry.

4. Define the main characteristics of soils suitable for cocoa cultivation on your estate and advise on your choice of fertiliser programme until trees are five years old. (10 marks)

One candidate failed to answer this question and another revealed little knowledge of soils suitable for cocoa cultivation. A third candidate misread this question and described soils in East and West Malaysia which are suitable for cocoa cultivation. Most candidates omitted to describe the texture and structure of their soils and only one referred to their organic matter contents.

5. Discuss modes of action of insecticides and the principles of their usage on cocoa. (10 marks)

Few candidates seem to appreciate the importance of natural predators in insect pest control. The spraying of Bidrin, a broad-spectrum residual insecticide of high mammalian toxicity, was favoured by Sabah candidates.

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6. Write short notes, giving recognition features and treatment for each of the following: —

(a) Vascular streak dieback (5 marks)

Two candidates provided model answers. Other candidates did not record the correct identity of the causal pathogen and/or made no reference to predisposing factors.

(b) Diseases caused by *Phytophthora* (5 marks)

Descriptions of the two diseases—black pod and stem canker—tended to be inaccurate and control measures were sometimess omitted from answers.

(c) Helopeltis (5 marks)

Generally well answered.

(d) Mammalian pests (5 marks)

One candidate advocated use of Bidrin insecticide for rat control!

7. Write short notes on the following: —

(a) Formation pruning of cocoa (5 marks)

Although candidates may have had clear ideas of what pruning should be done, answers tended to be rather vague.

(b) *Cynodon dactylon* or *Cyperus rotundus* (5 marks)

Badly answered. Few candidates appreciated that most Upper Amazon clones *are self-incompatible, but individuals within* progenies *derived from these clones are generally cross-compatible.*

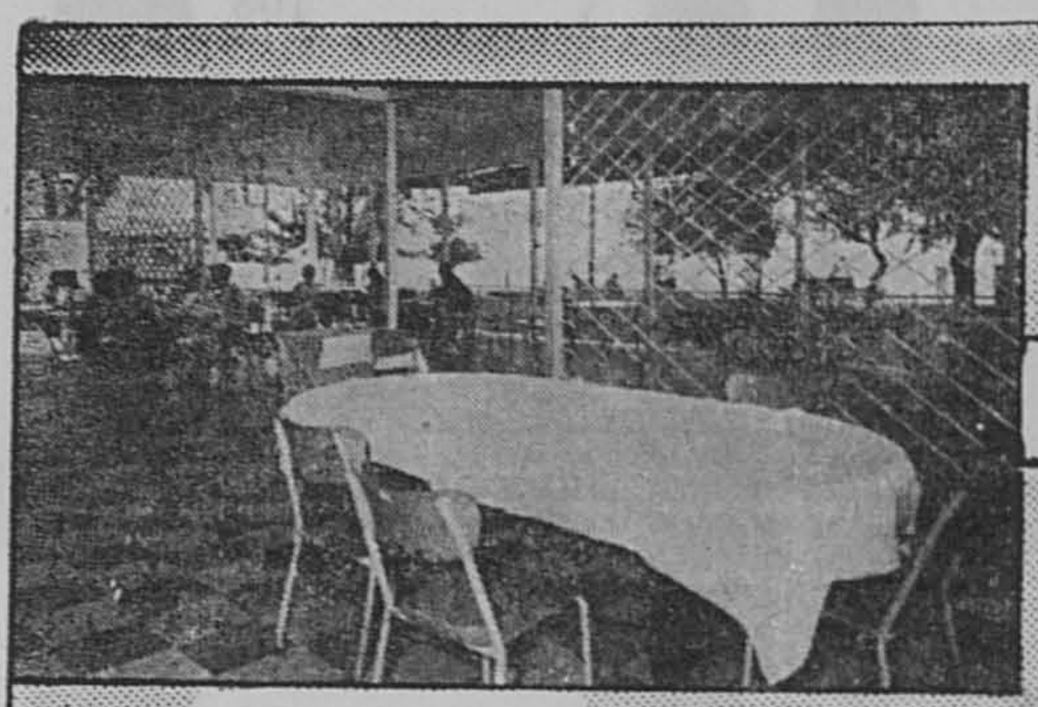
(c) Pollinating insects and compatibility mechanisms of cocoa (5 marks)

The role of midges (one candidate wrote migits!) as pollinating agents was not always appreciated. One candidate incorrectly cited bees as pollinating agents.

(d) Urea (5 marks)

The problem of volatilisation of nitrogen following application of urea and circumstances conducive to such losses were not discussed by most candidates.

Details of Part II will appear next month



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PRICES ON APPLICATION

Trends in natural and synthetic rubber

Producers and Users examine prospects at UNIDO meeting in Vienna

Future trends in, and competition between, natural and synthetic rubber were examined by experts from a number of countries directly concerned with these industries at a four-day meeting which started in Vienna on 27 March. It was arranged by the United Nations Industrial Development Organization (UNIDO).

Until 1962 most of the rubber used in the world came from trees in Asian plantations, but since then synthetic rubber has surpassed it and now provides three-fifths of the total. Nevertheless, the quantities produced are in both cases still increasing, with research and improvements in production adding continuously to their applications. For industry throughout the world connected with either type there are many problems to be faced, among them those of planning for future demands, calls for diversification and specialization, and pressures for reduced prices combined with higher freight charges. Many of them are of immediate concern to developing countries, especially those where rubber production was pioneered.

Countries from which about 40 participants and observers for the meeting were drawn included Austria, Brazil, Canada, Egypt, Finland, Federal Republic of Germany, India, Indonesia, Italy, Malaysia, the Netherlands, Poland, Romania, Switzerland, the United Kingdom and the United States, among them government officials and representatives of private industry. In looking at prospects they were due to consider the most recent information from international and other organizations.

In opening the first session Nikolai K. Grigoriev, Director of the UNIDO Industrial Technology Division, speaking on behalf of the Executive Director, Ibrahim Helmi Abdel-Rahman, said that rubber, either natural or synthetic, plays a significant role in all branches of national and international industries and economics of developing and developed countries.

"Remarkable results" he added "have been achieved recently through the development and utilization of new types of synthetic rubber which up to a certain limit can replace natural rubber for many uses. At the same time, through extensive research and development programmes accomplished in developing countries, the quality and yield of natural rubber have been substantially improved, enabling further progress to be made. Standardization of natural rubber has also helped in international trade."

Mr. Grigoriev also drew attention to UNIDO's particular interest in the industrial progress of developing countries and hoped the meeting would assist by identifying future work in the promotion of new projects through transfer of technology and encouraging new investments. UNIDO would also welcome the considered conclusions reached as well as recommendations for its future activities in this field.

Dr. L.C. Bateman of the Malayan Rubber Fund Board was elected Chairman of the meeting; Ralph T. Lamberson, International Institute of Synthetic Rubber Producers, Inc., USA, Vice-Chairman; and George W. Bricker, of C.W. Robinson and Co. Inc., USA, Rapporteur.

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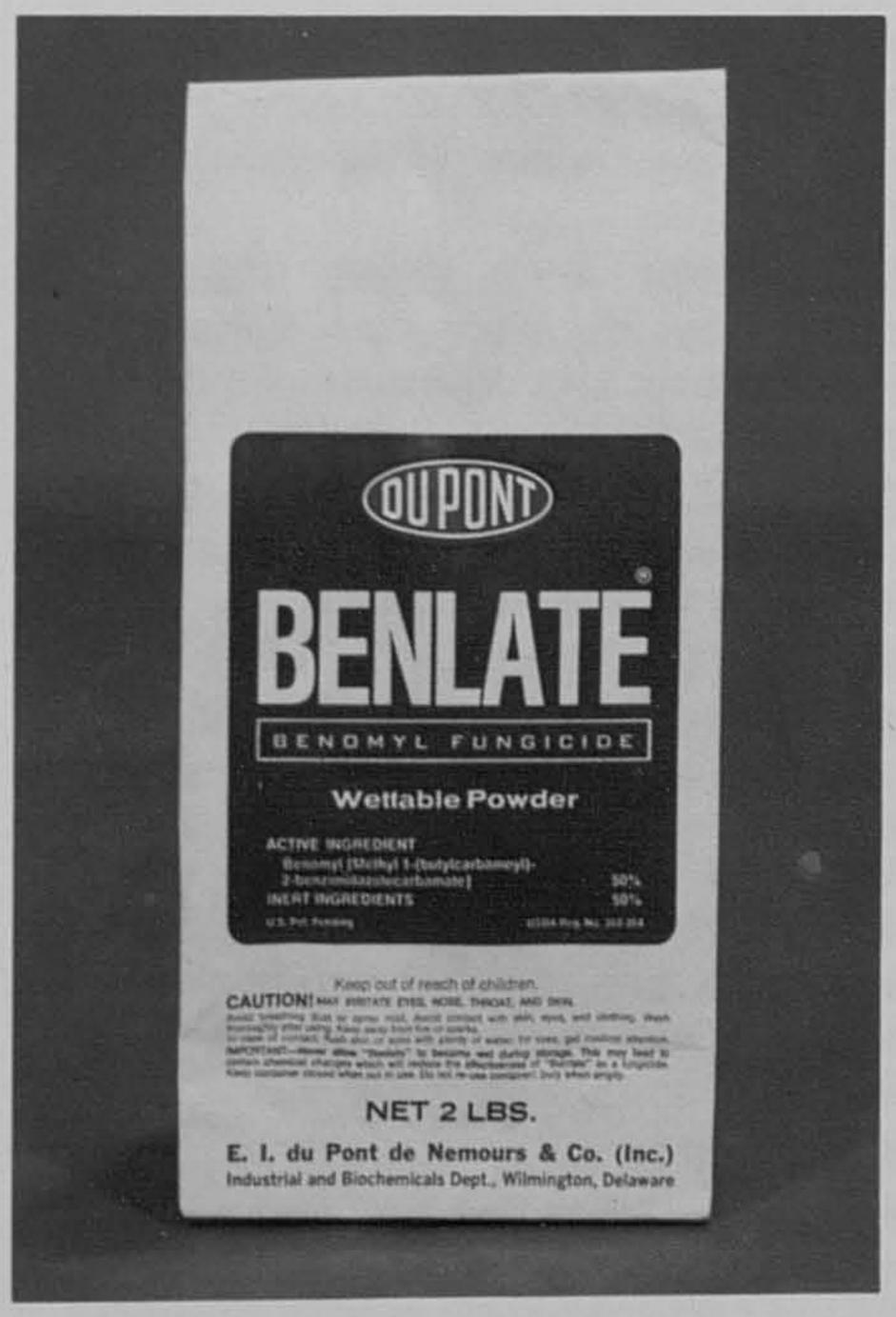
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Apply Lannate® as a spray at the rate of 4 oz. per 80 imp. gallons of water (6 grams in 4 gallons) and add a wetting agent at the manufacturer's recommended rate. Use a conical nozzle and adjust the spray until coarse. Use a high pressure to obtain good penetration into the bunches and spray to run-off.

WHEN TO APPLY:

Begin application when the first signs of insect attack are apparent on the bunches. Repeat at 14 day intervals as long as needed.

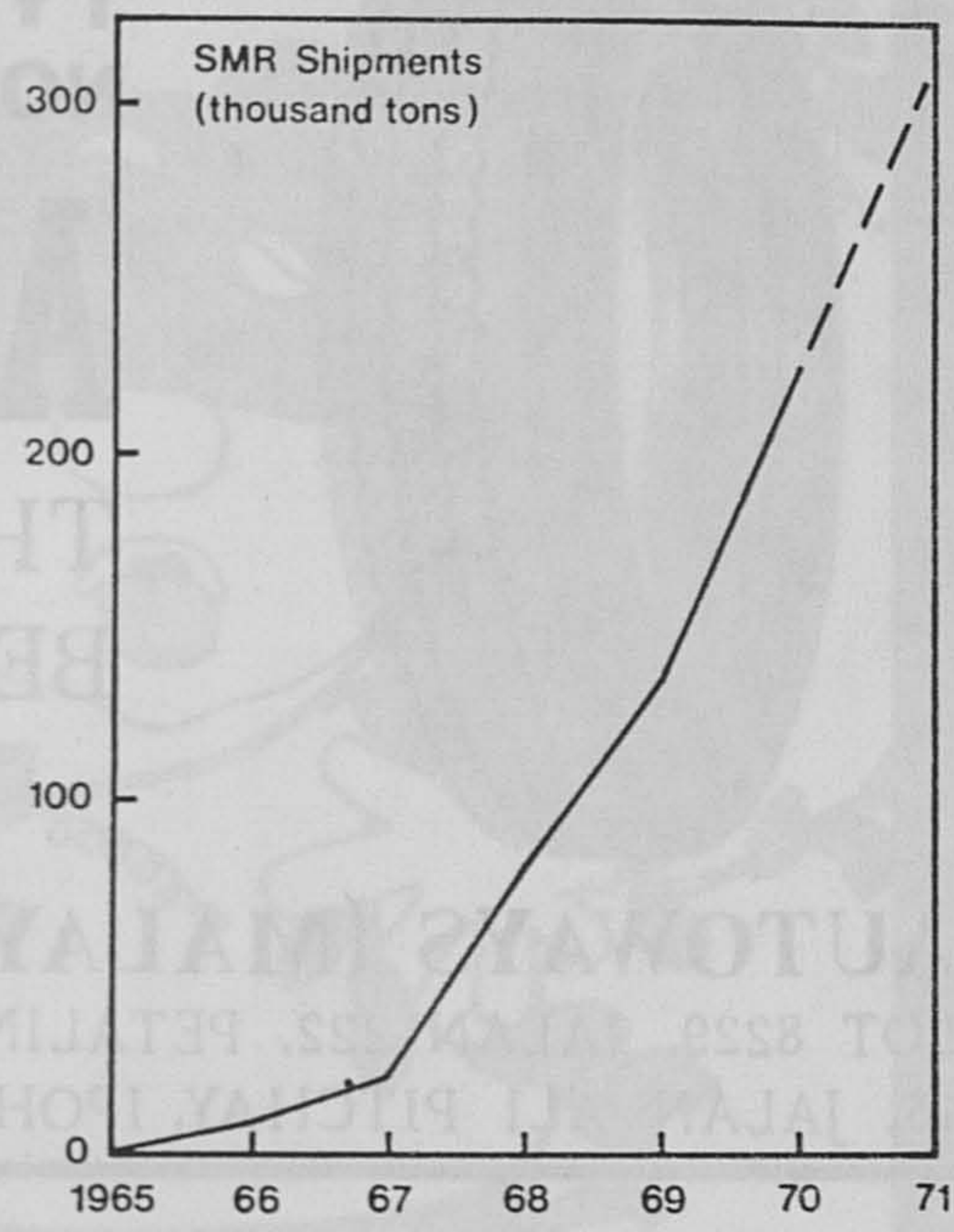


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Rapid growth in 1971 SMR shipments

(from *Rubber Developments*)

Standard Malaysian Rubber (SMR) shipments for 1971 look like comfortably exceeding earlier forecasts. The end-year total should be around 320 000 tons. Producers have shown their faith in the SMR concept and consumers have supported this faith by taking 100 000 tons more this year than last, an increase of nearly 50%. Nearly one-quarter of Malaysia's natural rubber now travels as SMR.



Above: The chart of SMR shipments since the introduction of the scheme in 1965 shows clearly the dramatic increase in offtake.

The rapidity of SMR growth makes longer term forecasting very difficult, but the indications are that 1975 will see an output of perhaps one million tons. It is interesting to reflect that only six years ago there were observers, especially in the 'markets', who doubted whether SMR would really succeed. They failed to recognize the imperative need for natural rubber to break away from traditional grading methods and move fast into the era of technical specifications.

If only the price could reflect the statistical scene! Price, alas, is determined by so many things that are outside the direct laws of supply and demand. Rubber is part of the world economy and has to take its chances with everything else. The fact is that rubber, whether from the tree or from petrochemicals, is really far too cheap. For that matter it is possible to believe that no polymers, plastics or fibres are commanding prices that really reflect their value to the community. They have certainly not 'enjoyed' any measure of price inflation; quite the reverse.

If the Malaysian producers are worried by the price situation, so also are their synthetic counterparts—not that this is very much comfort to either side. 'Straws in the wind' are the closure of a large synthetic rubber plant in the USA as old and uneconomic, and a spate of complaints in North America concerning dumping and price cutting. A longer term worry for the synthetic rubber producers is the prognosis by experts at the recent UNCTAD meetings of slower growth for the synthetics in the next decade. According to a *Financial Times* report on November 17, 1971, 'Demand will be down significantly from the rate of nearly 10% annually which was sustained throughout the 1960s'. Growth rates between 6 and 8% are forecast. At least the Malaysian industry can take some grain of comfort from the fact that it has done and is continuing to do all that it can to cope with bad as well as with good days. SMR is one weapon; ethylene stimulation is another that promises to help keep down production costs and to inject badly needed flexibility into the system. As reported in our last issue[1] ethylene stimulation is working out well and the recent publishing of *Guide for Ethrel Stimulation* by the Rubber Research Institute of Malaya shows the extent to which it is now part of the established scene.

P. W. A.

REFERENCE

1. ALLEN, P.W. (1971). Ethylene latex yield stimulation—a progress report. *Rubber Developments*, **24**, 74.



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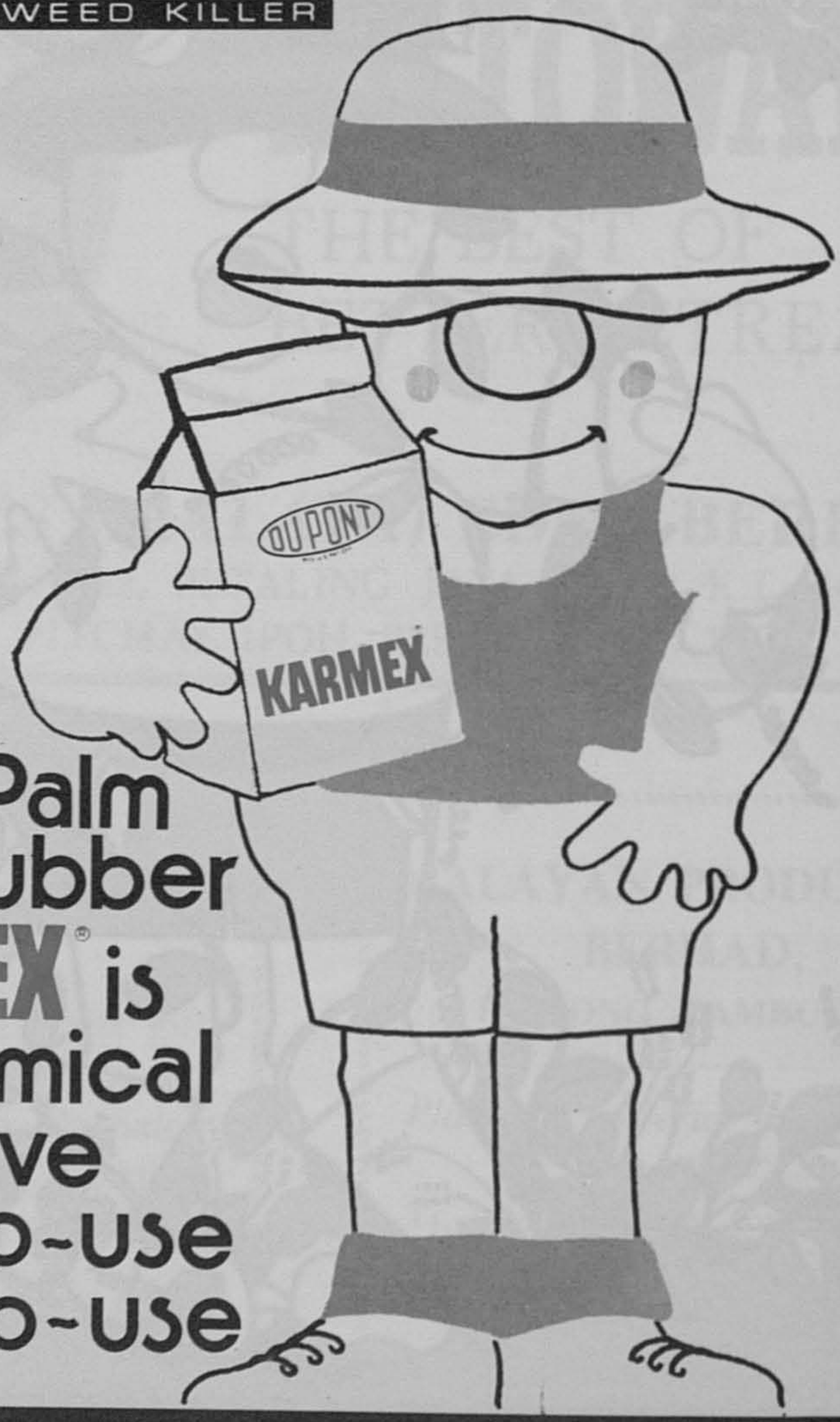


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21 January 1972

J L R Jayatilaka	(West Pahang)	Passed
J L Anthony	(Selangor)	,,
Dixon Chok Khen Kong	(Sabah–Tawau)	,,
Titus Ng Man Yin	(Sabah–Tawau)	,,
Peter Lee Yun Siung	(Sabah–Tawau)	,,

Agricultural Science Examination (Soils)
21 January 1972

J L Anthony	(Selangor)	Passed
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Peter Lee Yun Siung	(Sabah–Tawau)	,,

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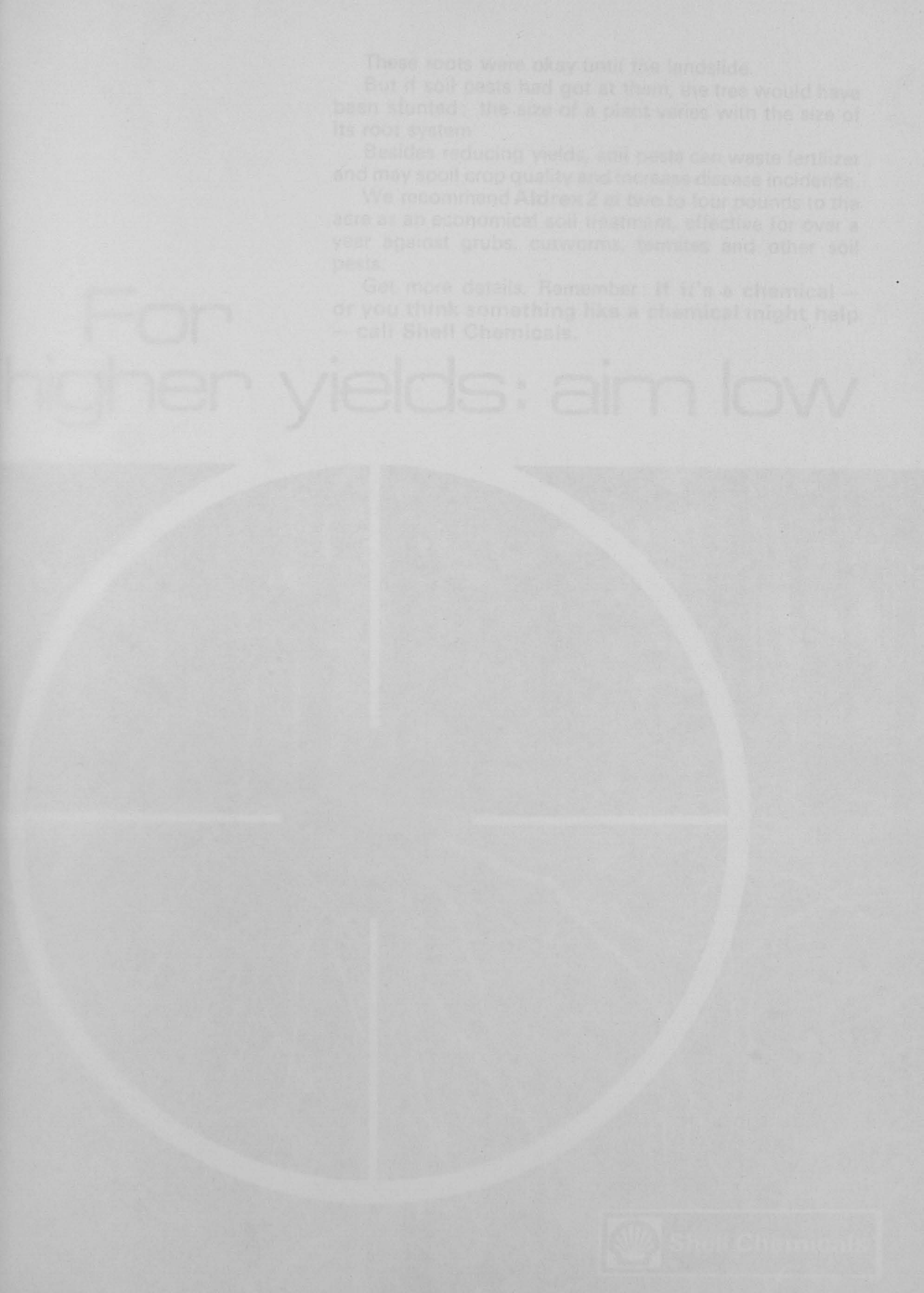
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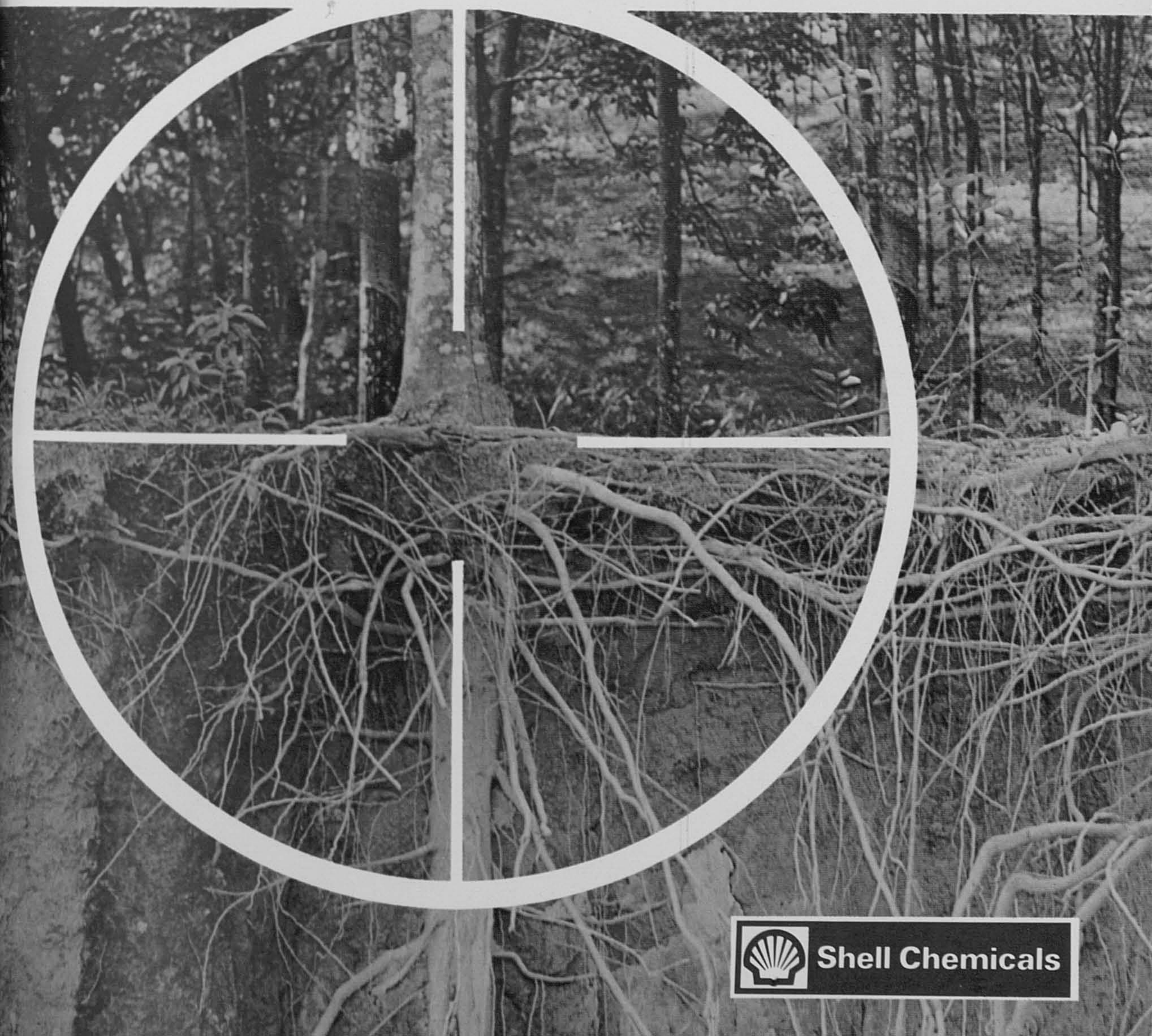
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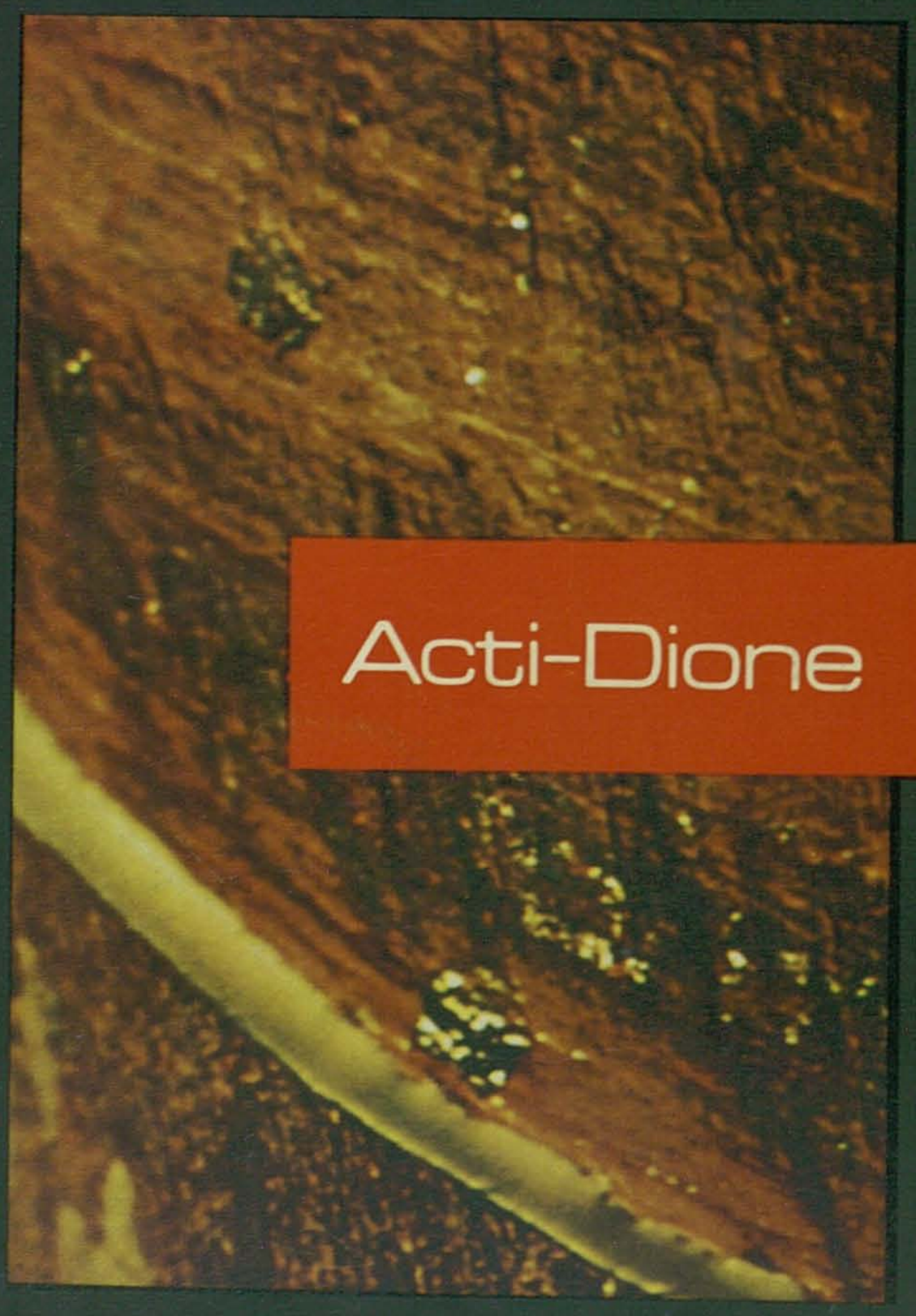
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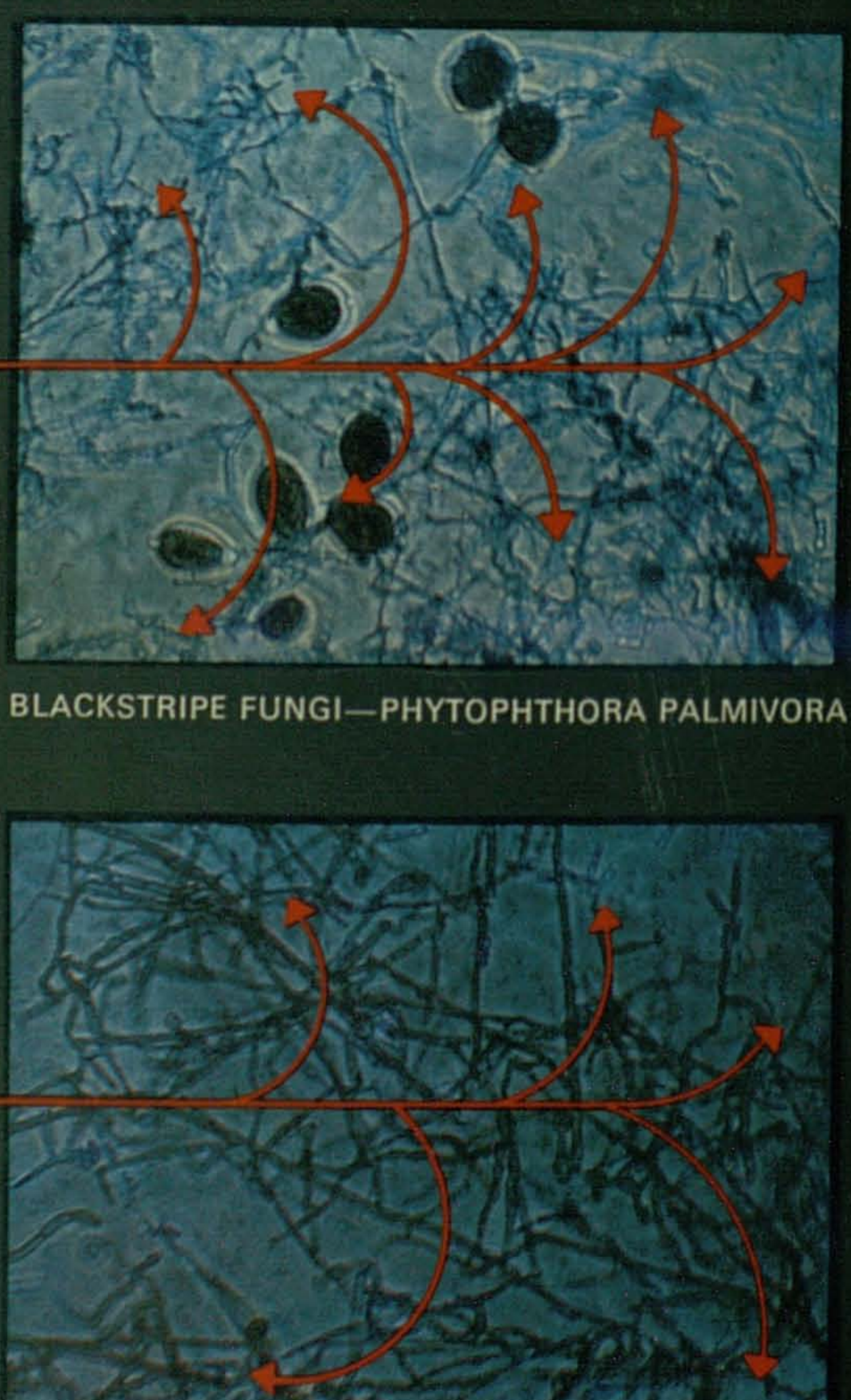
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