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MAGAZINE OF THE INCORPORATED SOCIETY OF PLANTERS

VOL. 48 NOVEMBER 1972 No. 560

Publishing Office :

1 Pesiaran Lidcol
P O Box 262
Kuala Lumpur
MALAYSIA

Telephone : 86396

Telegrams : ISPLA

Price : M$2.50

Annual Subscription : M$30.00

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SENTIASA MAJU

The Incorporated Society of Planters

Founded 1919

THE SOCIETY REPRESENTS the Planters of Malaysia and other territories, whose personal and professional interests it is bound to endeavour to secure and promote.

OBJECTS foremost in the Society's Memorandum of Association are:

To promote the general interests of the planting profession.

To promote the advancement and facilitate the acquisition of that knowledge which constitutes the professional qualification of planter.

To watch over, promote and protect the mutual and individual interests of its members in respect of matters pertaining to or arising from their employment in the planting profession.

To promote and maintain good feeling, co-operation and understanding between members and their employers.

ACHIEVEMENTS of the Society are a technical education scheme, the publication of authoritative works on tropical agriculture, a monthly magazine featuring original technical articles, the sponsorship of conferences and symposia on tropical crops, and the organisation of joint consultation with employers.

MEMBERSHIP of the Society is open to: —

A Those directly employed in plantation management such as estate managers, assistant managers, superintendents, supervisors and cadets, and

B Executive engineers, estate medical officers, and qualified scientific or administrative staff of estates or organisations mainly concerned with the planting industry.

Category B may include those employed in such other senior executive, administrative, professional or advisory capacities as may be deemed by the Executive Council as being equivalent thereto

Neither category shall include clerks, conductors, hospital assistants, etc.

ENTRANCE FEE for new and rejoining members is $10/- and must accompany application.

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Category B		
Ordinary Members employed as Executive Engineers, Estate Medical Officers, Research Staff etc., wherever resident	$ 48	$ 48
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Editorial:

The Society's 1972 Conference

The ISP International Oil Palm Conference 1972, to give it its full title, was opened on 16 February in Kuala Lumpur by Y.B. Datuk Haji Abdul Taib bin Mahmud, Malaysia's youthful Minister of Primary Industries. As a measure of the close attention being paid by his Ministry to oil palm it was a pleasant break from tradition to have him remain after the opening ceremony to hear the conference get under way. More pleasing still was his return to hear it summed up on the Saturday morning by Mr C W S Hartley, CBE, and in place of our usual editorial we present below the greater part of what Mr Hartley told the 800 participants present:—

"It is difficult to sum up concisely a conference covering so many diverse aspects of oil palm cultivation, and it is perhaps impossible not to be controversial.

The papers have been very well grouped: the first group showed us how progress can be made through inter-disciplinary efforts. The geneticists and breeders told us which characters in our fruit bunches they could most easily pass on from one generation to another (heritability), and from what they told us it is clear that we shall judge them increasingly on the quality and composition of their fruit. The physiologist, probing ever more deeply into the mechanisms of growth, has opened new paths of selection for the breeders. At one and the same time agronomists have been given explanations for their density effects and breeders have been given a possible new tool for increasing our bunch yields. But the complaint is still heard that what is going to be done excites interest, while what has been achieved is not demonstrated. Breeders and seed suppliers will everywhere have to meet this complaint. I cannot but remember that some 30 years ago my predecessor at WAIFOR* put what was termed, (or he termed) 'bush seed' into annual comparison with the first selected seed he issued.

It was a pity that we did not have with us oil palm breeders from overseas; as a result we had no discussion of breeding methods. I still hope that sometime, somewhere, someone will organise a symposium for oil palm breeders at which they can all be present.

We then passed to matters in which planters hold sway. Nursery practice in Malaysia has become so standardised and efficient that we could do no more than applaud those refinements presented to us from Banting where, be it remembered, the polybag nursery underwent its first trials. It was Banting too, which told us what to do about *Ganoderma* and the efforts of practical planters to obey gave us our finest set of coloured slides. Talk about costs at this stage seems irreverent and out of tune. "Do it or don't come crying to me in eight years time" we were told, and we accepted this without a murmur.

---

* West African Institute for Oil Palm Research

There was so much unexpected agreement in the next section that it gave time for a lot of rather unseemly word-play. However, it..... was generally agreed that though there might be no increase in yield, removal of young inflorescences for a short period prior to bringing into harvest might be useful for managerial and perhaps for sanitary reasons. Removal over a period of more than 12 months is to be discouraged.

Many of us felt that the discussion of assisted pollination hardly had time to get under way. I have said before that in Malaysia practice often runs ahead of research. This is because the industry is often confronted with problems which demand a stop-gap answer before a fully scientific investigation can provide a real understanding. It has also been rightly said that to state a problem clearly is as important as to solve it, and is as much as many of us can do in this life. We had a paper which clearly restated the problem, and we saw that there were strongly held views in opposing directions. An understanding of all the factors involved will only come with lengthy, painstaking work.

Perhaps the highlights of the conference were the two lengthy sessions on nutrition. We were presented with the results of several fertiliser experiments and many leaf analyses and, for the first time at an oil palm conference I think, anionic nutrition was introduced and discussed. This suggested that our leaf analyses may have to be extended by inclusion of one, or perhaps two further elements. The value of leaf analysis was shown to us in a paper dealing with a fertiliser experiment on a soil where yields on uncorrected plots were very low and where visual symptoms were displayed. However, the papers as a whole, and the discussion, reflects the current disenchantment with leaf analysis for diagnosing fertiliser needs where the plain of nutrition is already high, and suggestions were made for the possible substitution of a different or supplementary indicator—vegetative dry matter production.

The real advance shown to us in some of the papers was the demonstration of economic returns from fertilisers based on the results of fertiliser experiments and (again for the first time at a conference I think) we were taught how to evaluate our agronomic results in economic terms. It has been repeatedly impressed on us that fertilisers are a very high proportion of the maintenance costs and the proper scrutiny of this expenditure by agronomists and economists together should give us much greater confidence and get us away from what might be described as the 'slap-happy era'.

From these weighty subjects we turned to pests. We saw exactly what we would lose by allowing our leaves to be eaten; we were encouraged to admire the silhouette of rhinoceros beetle damage and were convinced that the rat population can be substantially reduced. It was generally agreed that outstandingly valuable work had been done on rat control, though the need for continued testing of new poisons is well known. Though we gained further knowledge of other well-known pests, it was noticeable that there was no paper on diseases. It is perhaps not generally known that there are two serious, or even catastrophic diseases now causing much concern in Colombia and other American countries. I understand that a paper was prepared

on these by an eminent Colombian plant pathologist but that the paper unfortunately arrived too late for inclusion.

Though we did not discuss pathogenic diseases, we were given a very instructive summary of the work which has been going on concerning the symptoms and cure of boron deficiency—a matter of great controversy for a long time, but which I now feel is cleared up, if not perhaps entirely, very largely.

This morning we have been largely engaged in discussing harvesting methods and their effect on yield and quality of oil. Scientific confirmation was given to the well-known proposition that the more bumps the bunch gets the higher the f.f.a. We also had the first serious study in this country of the relations between harvesting interval, the percentage of loose fruit, oil in fruit and f.f.a. This paper clearly needs a great deal of study and consideration by all producers.

With physical methods of harvesting we got into a machine-power versus animal-power controversy; the presentation of the case for the buffalo was the most stimulating, in more ways than one, of the conference. In my view, however, the methods presented, one for the field and one for road transport, were complementary.

In conclusion I would like to thank and congratulate the Committee for the excellent organisation which we have seen throughout the three days here. I think we've all had a very happy and useful time and I, for one, have learnt a great deal."

Mr C W S Hartley, CBE, during his summing up of the I S P International Oil Palm Conference, 18 November 1972.

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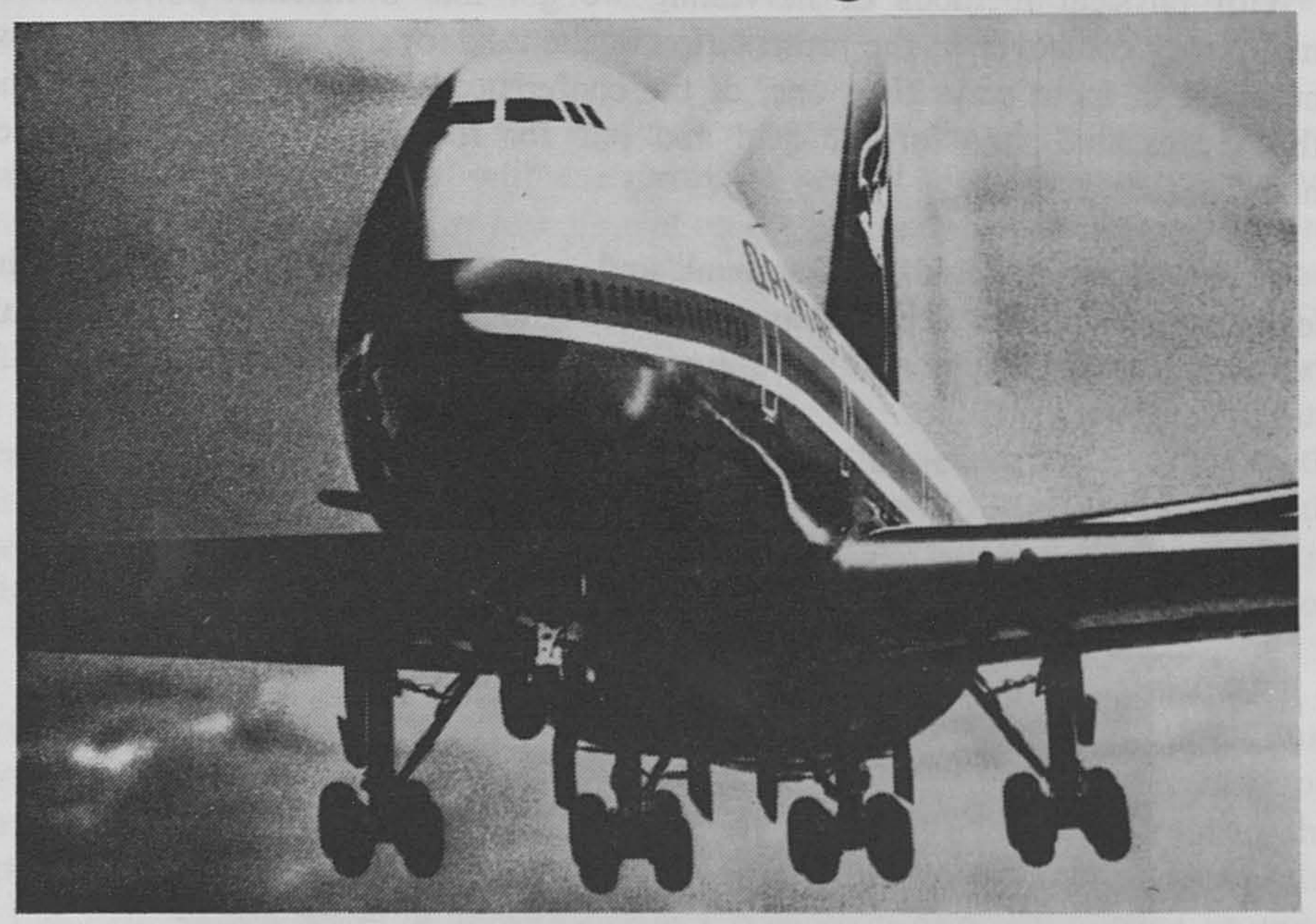

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The Society's 1972 Conference

Address by Y.B. Datuk Haji Abdul Taib bin Mahmud, Minister of Primary Industries, on the opening of the I.S.P. International Oil Palm Conference at Federal Hotel, Kuala Lumpur, on 16 November 1972.

Let me first congratulate the Incorporated Society of Planters for organising this International Oil Palm Conference. I am indeed most happy to meet such an impressive gathering of planters, researchers, scientists and others connected one way or another with the industry from both within the country and outside—all sharing a common identity of interests to work towards the good and future progress of the oil palm industry. May I take this opportunity to extend a warm welcome to our distinguished participants from abroad; I hope they will find their stay here fruitful and enjoyable.

This is the third major oil palm conference organised by the Society, apart from the Symposium on the Quality and Marketing of Oil Palm Products held in 1969. Each conference and each symposium has brought to light new and interesting ideas and research results. But each time it has also generated greater expectations and new hopes for the future. I am sure this will apply equally with the present conference—for whilst much has been achieved to bring the oil palm industry to where it is today, much more remains to be done to exploit the potentials of this growing industry and to further increase its competitive strength.

For indeed, palm oil is entering a period where in the years ahead it must be prepared to compete more effectively with other oils and fats. The position of palm oil has long stagnated for the greater part of the sixties, even as production increases in countries like Malaysia barely managed to offset production declines elsewhere. On the other hand, production of other oils and fats, particularly from the indus-

trialised advanced countries, expanded steadily to the rising demand in world consumption. Since 1968, however, the trend in world production of palm oil has started to pick up. Now with most palm oil producing countries geared to larger increases in production, the forecast, based on FAO's estimate, is that palm oil's share of total world supplies of oils and fats would increase from just over 4% to nearly 8% during the present decade. The share of palm kernel oil would also increase but still be less than 2% of all fats and oils. Exports of palm oil would rise at an even faster rate than production increases. This means that palm oil would have to compete successfully for a greater share of the growing oils and fats export market in time to come.

I am convinced that palm oil can justify, and deserves, a much bigger role in international trade in oils and fats than it at present occupies. I myself have been greatly impressed with the rapid progress made in the industry. In the case of Malaysia, oil palm emerged as a major crop of importance only in recent years. It was only in the sixties that we took on oil palm as a major crop to diversify our economic base in order to lessen our heavy dependence on our traditional twin pillars—rubber and tin. The topography and nature of our land as well as climatic conditions all tend generally to favour the cultivation of tree crops, and oil palm proved to be no exception.

The progress in our oil palm development was symbolic not only of the desire and success of our diversification programme, but also contributed greatly to the structural change in the rural sector of our economy. From a purely estate crop, oil palm was introduced to smallholder participation on a large and growing scale. The success of our efforts in this direction reflected well on the discipline and vigour of the rural workers and their ability to adapt to new and changing patterns of agricultural development. Today, smallholder output accounts for a significant percentage of overall production of palm oil and is expected to be the burgeoning force in this growing industry in the years to come.

The dynamism of the oil palm industry is seen not only in the changing agricultural landscape and in the additional new acreages which come into cultivation, but also in the rapid progress made in reducing costs and improving efficiency. Yield increases have been significant. With unselected Dura palms, as originally planted in estates, the yield was only about half a ton of oil per acre per year. But through selective breeding, yields of $1\frac{1}{2}$–2 tons or more per acre can now be obtained. Indeed, the yield of oil per acre in the case of oil palm is one of the highest among the oil-bearing vegetative crops, and the prospects are for palm oil yield to continue to increase with improved planting material, better management practices and processing techniques.

Over the years too, considerable progress has been made to improve the quality of the product itself. There is now greater knowledge about the factors giving rise to free fatty acid, those influencing the bleachability of palm oil and those affecting the resistance to oxidation. As a result the industry has been able to adopt better and more efficient techniques in harvesting, fruit collection, processing, oil storage and transportation, to enable a marked reduction in the free fatty acid content and

to produce a palm oil which is extremely pure and with excellent bleaching characteristics.

All the foregoing improvements mentioned have of course been made possible through research, and seeing that some 30 papers are to be presented for discussion during this $2\frac{1}{2}$-day conference, the scope for further fruitful research has not narrowed, but I believe has even widened. For there is room for still further improvement and upgrading of our palm oil as a product. We must produce an oil which fulfils not only a general need but also the more specific and diverse requirements of particular and important end uses.

I am aware that while palm oil has certain advantages in terms of certain uses, it has also certain disadvantages in terms of others. It is particularly these remaining disadvantages in palm oil that we must try to eliminate. We must not be satisfied that palm oil has to fetch a lower price than several of the other oils because of existing disadvantages. We can only be satisfied that palm oil can be sold at a lower price solely and purely because we can produce palm oil more efficiently and more cheaply than other competitive oils and fats.

I am confident that over time, research can provide the industry with the necessary muscle; but how well the industry can deliver the punches will depend on how well the research efforts are integrated with the needs of production, marketing, and final demand. For in the more competitive situation for oils and fats which is emerging, it has become more important than ever to ensure that we have a comprehensive and well-coordinated approach to the multi-facet problems of the industry, involving the interaction of researchers, producers, traders and users.

This kind of development is happening in the rubber industry and I would like to see it happen too, in the oil palm industry. Many of the ramifications are already there. Several of the big producers not only produce palm oil but they also undertake research and are involved in the selling of palm oil as well. On the Government side it has given a new impetus to palm oil research through the Malaysian Agricultural Research and Development Authority (MARDI) as well as through the National Institute of Scientific and Industrial Research (NISIR). However, what is needed is to have a better tie-up of all interested parties so that we can evolve a common strategy and a common programme of action.

For the purpose which I have stated my Ministry intends to set up an Advisory Council on Palm Oil Development as a first step towards evolving an integrated structure and approach for the development of the palm oil industry on a sound and more effective basis. The Council would provide closer coordination, liaison and dialogue between the Government and the private sector and among Government agencies themselves. It would ensure the necessary link-up of research, production, processing and marketing. On the research side it would see that efforts are strengthened to provide greater attention towards more efficient production on the one hand and to the needs of an evolving and more sophisticated marketing structure on the other. It would look into matters of uniformity of quality and reliability with a view to developing common standards and grades for the product.

It would also provide guidance towards achieving greater strength and coordination in our marketing structure and in our overseas promotion efforts. In this connection, I am pleased that in the Malaysian Palm Oil Producers Association we have already established the basis for a common understanding and approach in our marketing efforts. This is more than can be said for many other industries. I think the Association's framework can be further strengthened to provide leadership and consolidation of the industry. It must be forward looking and flexible to accommodate changing needs and to serve as a vehicle for creating greater opportunities and benefits for the industry and its members. On this basis I would like to see all palm oil producers in the country brought within the ambit of the Association so that we can achieve greater unity in purpose and in action.

I feel that once we have organised, streamlined and strengthened our national efforts, it would facilitate our entering into joint action and cooperation with other palm oil producing countries as well. There is need for closer cooperation on an international or regional basis particularly in research and in such matters as market and export promotion. It would also be important for palm oil producing countries to arrive at common standards on quality and grades to facilitate the international trade in palm oil and products.

There are therefore good possibilities of enhancing the prospects of palm oil on both a national and an international basis. There is also definitely a bigger role for palm oil to play in the international market of oils and fats. For when it comes to palm oil, it is less subject to the vagaries of weather, as supplies of many of the annual crops are. And neither is it as unpredictable as fish catches. And when it comes to animal fats and oils, they have, as many would say, "the least propensity for growth".

Well, gentlemen, I would like to thank the Incorporated Society of Planters for inviting me to address you today. I shall be paying close attention to your deliberations in the course of these two and a half days with great interest. Finally, may I wish you all a successful conference.

I now have great pleasure in declaring open this International Oil Palm Conference.

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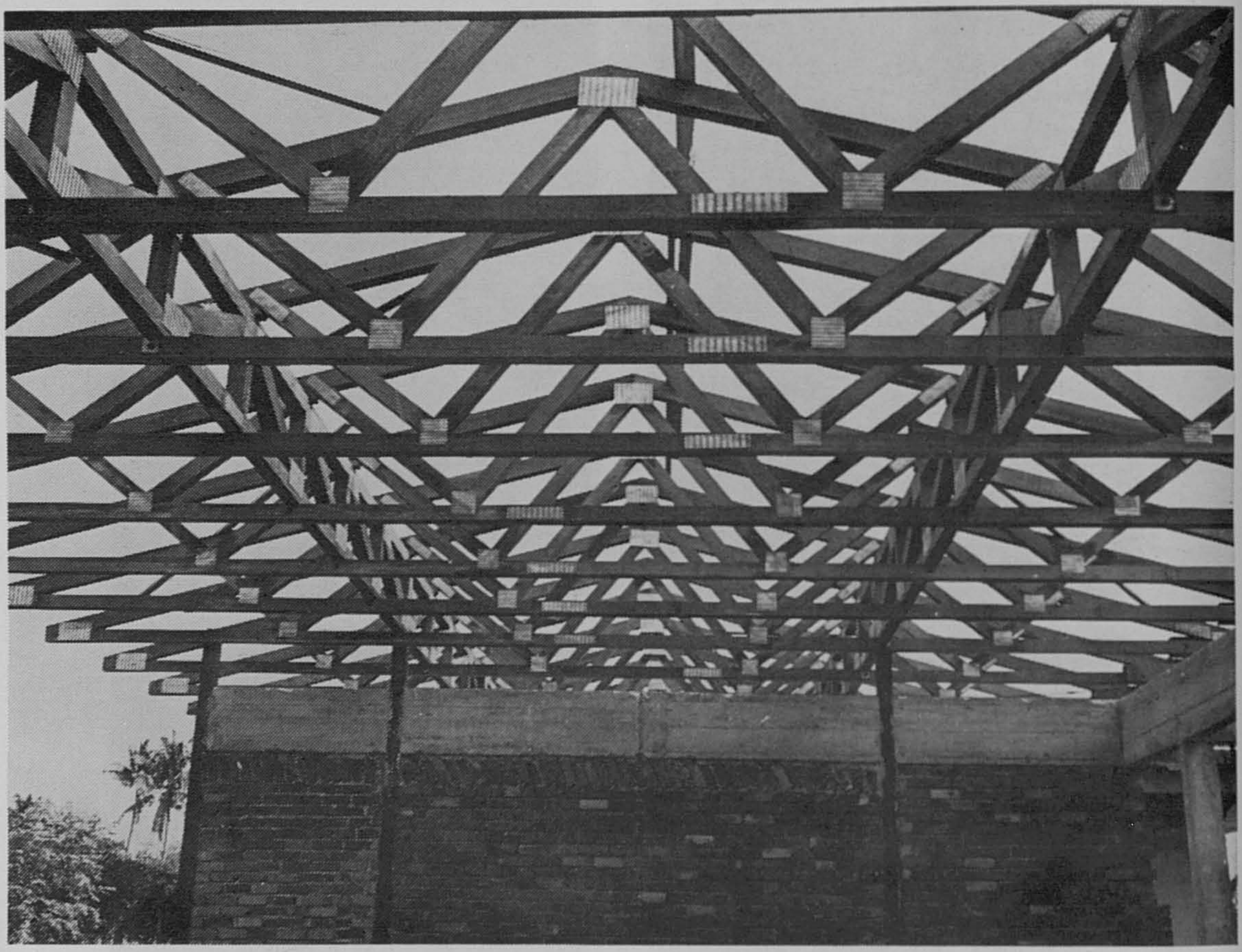

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Bukit Takun

Last month The Planter **reprinted from the** Malay Mail **of 26 October 1972 a letter from ENGINEER recommending destruction of Bukit Takun in the interests of development. Further comments have appeared in the press by Dr B. C. Stone and Dr J. B. Lowry, and over the pen-names of SASEKUMAR and MAHASISWA in favour of conservation, and by CONTRACTOR supporting ENGINEER. As promised, here are comments on the views of ENGINEER.**

Two hundred years ago the industrial revolution began in Europe and its 'where there's muck, there's money' philosophy was exported to America soon afterwards, and in our day to Japan. The workers were herded into slums, the works poured pollution into the skies, the rivers and the sea, the earth was torn apart and tip heaps were left without any attempt at rehabilitation. More than a century passed before it was realised that the social evils were not an essential part of industrialisation. It has taken even longer to realise that exploitation can be co-ordinated with conservation, the physical rape of the earth is not essential. The Americans, Europeans and Japanese have learnt the lesson from such incidents as:—the poisoning of the Great Lakes; if you fall in, get medical advice; the smog over London in December 1952 which choked thousands of elderly people, (there were more deaths than during a similar period at the height of the Blitz); the slag heap that wiped out a generation of children at Aberfan; the masked children in Tokyo schools.

The combat of pollution is the negative side of conservation. It has, however, made people aware of their interactions with their environment and popularised the conservation movement. People are now aware that the easiest and cheapest methods for the engineers and contractors at present may not be the most profitable for the community in the long run.

The positive side of conservation is the preservation of the environment and with it many living things of great potential value. All our crop plants were once wild, so were our domesticated animals. The wild is the reservoir of plants and animals for future improvements in productivity, quality, disease resistance and for biological control of pests. Almost every drug has come originally from wild plants, including the basis of the pill (for population control) and quinine (on which the synthetic anti-malarials are based). The anti-biotics from fungi are not exceptions; a few years ago, a biologist collected fungi from the guano in Malaysian caves in the search for new anti-biotics. The important thing is that no-one can say at any time that every useful plant and animal has been discovered and utilised. The more that is discovered, the more evident it is that man has yet more and more to discover. Since man eats food, wears clothes and protects his health with drugs, most of which are of direct biological origin, there is nothing academic about conservation of the raw material for improving his lot in future. Since we cannot predict what is wanted and what can be discarded with impunity, we have a moral obligation to generations yet unborn to hand on to them an adequate, representative selection of all forms of life as we have received them. The only practical way,

including a range of genetic diversity within species, is to preserve examples of every habitat.

Equally on the academic or purely scientific side, (if there is such a thing, because the purely scientific can within a generation assume a most significant role in our practical lives for good or ill, *e.g.* atomic research, ballistic projectiles, transistors, anti-biotics), no scientist will say that the potential of any object has been exhausted. The geologists and in particular the biogeographers (of plants, molluscs and cave life especially with respect to limestone) realise that future generations of Malaysian scientists will stand on our shoulders and learn more by the application of techniques, which have yet to be invented, and will collate that with the information won elsewhere. (CONTRACTOR jibed that those who want to save Bukit Takun do so in their own personal interest; this is not so, the conservationists are thinking of the future generations, we could clear up such personal observations as we wish to make, and decamp).

Therefore the need to preserve Bukit Takun, Batu Caves and the other isolated limestone hills remains as part of a deliberate plan to conserve representatives of all biological communities and living things, not only for future study, but for the future benefit of mankind. There is already a worldwide programme with this object. Malaysia should not take a selfish attitude and assume that the future is other nations' business.

Bukit Takun is a fine landmark, many humble people like the look of it and of Gunong Gajah near Gopeng and of many other characteristic scenic spots in Malaysia. CONTRACTOR might remember that these are the people, who may have more difficulty in expressing themselves than he has, but who have a right to their simple love of the way their country looks. Man-made landmarks can come and go, but Bukit Takun cannot be replaced. It is highly unlikely that future generations will thank ENGINEER for replacing Bukit Takun with thousands of dull dwellings sprawled along every road out of Kuala Lumpur. Bukit Takun has lasted thousands of years and is good for more. Can ENGINEER and CONTRACTOR be sure that any of their constructions will last that long, let alone be worth seeing? Tourists do not go to see rows of houses, they do not go to see a devastated countryside, they will go to see a few fine buildings, but as buildings become more commonplace, the attraction of unspoiled landscapes—characteristic of the country and rooted in the affection of the people—will grow. If preserving Bukit Takun increases slightly the cost of some forms of development, it should be regarded as part of the capital cost of passing on a pleasant country to future generations and of investment in tourism. Emerging nations in Africa have decided on such investments, even if Malaysia's planners take a shorter view.

ENGINEER and CONTRACTOR quote various figures to support that the alternatives of granite and subterranean limestone are uneconomic. Firstly these alternative materials are already being used profitably for all concerned in many instances, ENGINEER quotes one, namely Sungei Besi. Secondly, however the material is obtained, or in whatever form, the government can obtain its royalty on the exploitation of this resource. Saving Bukit Takun will not deny the government

revenue. Next, the costs quoted by these writers give comparisons at various stages, but the public consumer wants to know by what percentage the cost of the final article, road or building will be increased by the use of these alternatives. Since we have not been quoted this figure, it may be quite low.

Finally in other connections, Malaysia's economists and planners tell us that absolute costs are not so important as the number of 'employment opportunities' (*i.e.* jobs) created or the degree to which local resources are used or overseas currencies are earned. If the use of alternatives, especially subterranean limestone won from tin-mined areas, employs more people than blasting down the hills, this may be good for the employment situation. Local material will still be used, but from parts of the landscape already disfigured, while leaving the beautiful and interesting intact for the enjoyment of residents and overseas tourists bringing in foreign currency.

ENGINEER quotes Australia as a country which apparently presses on with exploitation and development regardless of conservation, the environment or the future. He is evidently out of touch with recent developments in Australia as well as elsewhere. The government of Western Australia has taken the advice of its Environmental Protection Authority and shifted the site of a huge new aluminium refinery at considerable expense, and was willing to abandon the whole project to preserve the Upper Swan from pollution. Some of the politicians, with a most reactionary reputation, are now championing co-ordinated and complete exploitation as the most efficient in the long run, just as we have advocated taking subterranean limestone from tin workings. A new breed of engineers is emerging, who are devoting their inventive talents to improving methods of exploitation so that there is a productive co-existence with and a contribution to conservation. Perhaps ENGINEER will yet join their ranks, because they realise that every developing country, Australia or Malaysia, does not have to repeat every stage in the industrial and urban development of Europe and America during the last two centuries.

More strength to the Mentri Besar of Selangor, who has not been rushed into a quick decision by commercial pressures. Let us hope that cultural and scientific values will be given due credit, so that it is not a purely materialistic and commercial equation.

P. R. WYCHERLEY.

Editor's note:

Dr P R Wycherley is a Fellow of the Incorporated Society of Planters and was formerly the Head of the Botany Division at The Rubber Research Institute of Malaya. He is currently the Director of King's Park and Botanic Garden in Perth, Western Australia. He was founder Chairman of the Batu Caves Protection Association, President of the Malayan Nature Society, councillor of the Malayan Zoological Society and Chairman of the Terrestrial Conservation Section West Malaysia Biological Programme.

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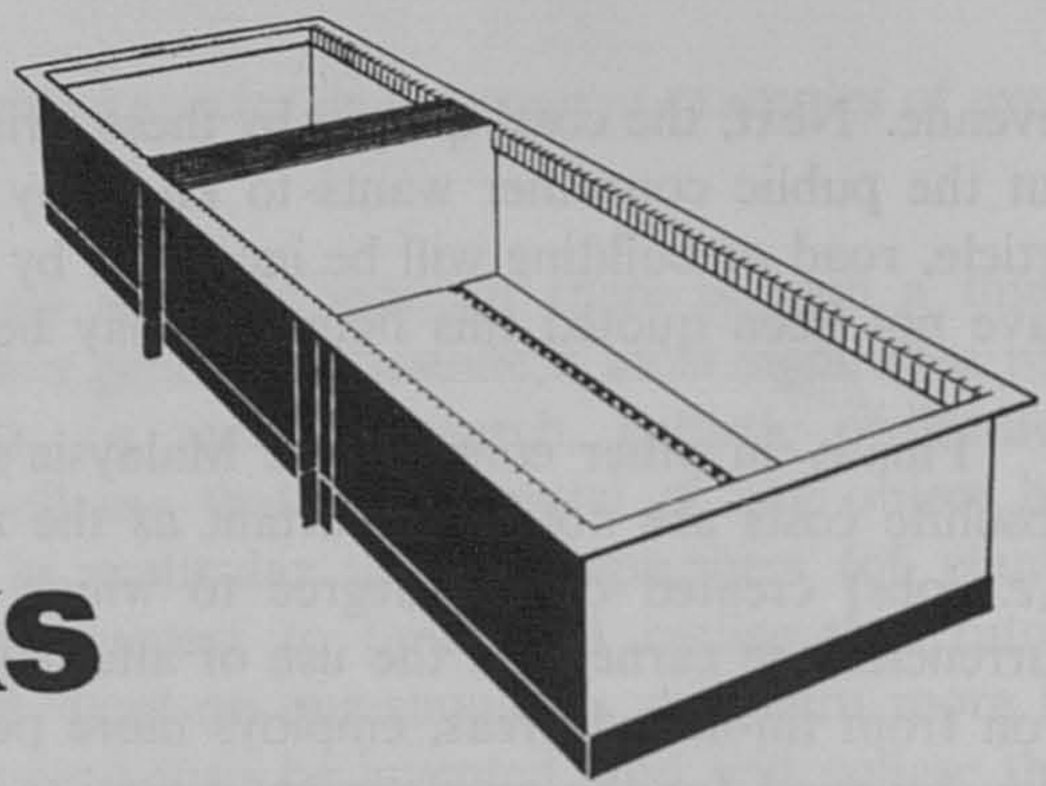

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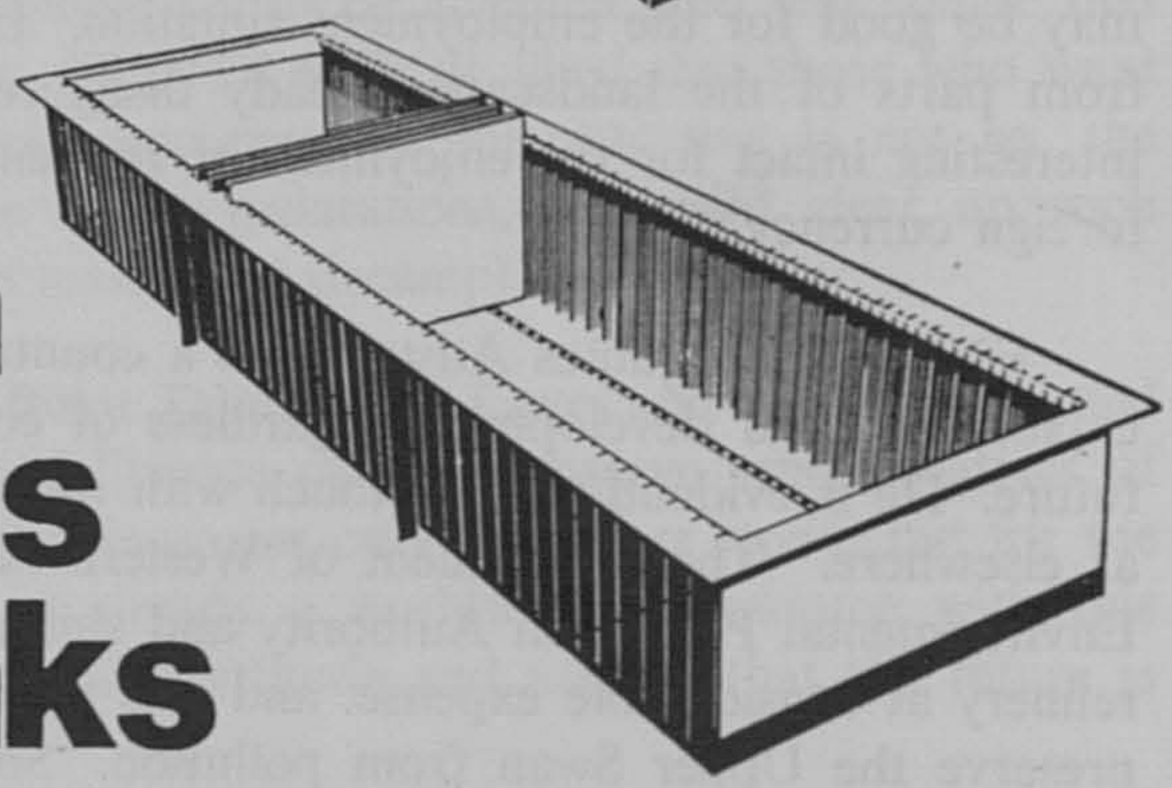

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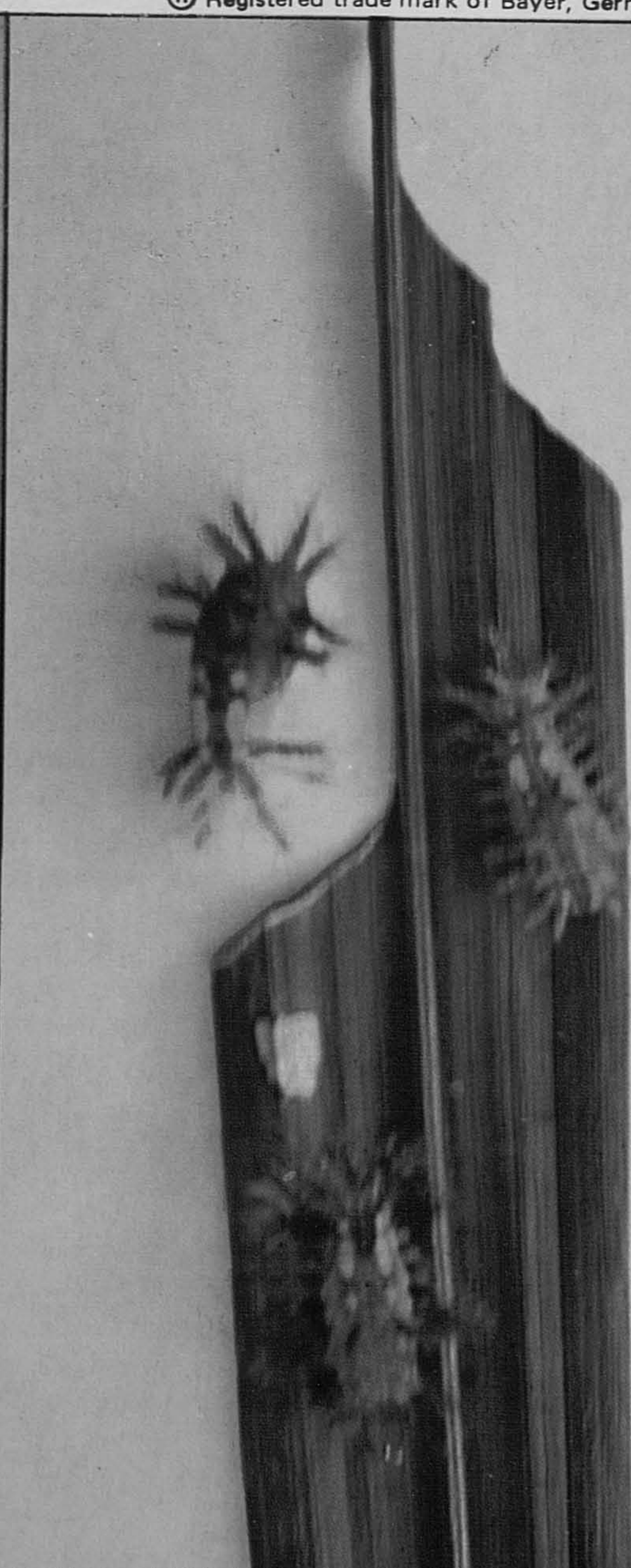

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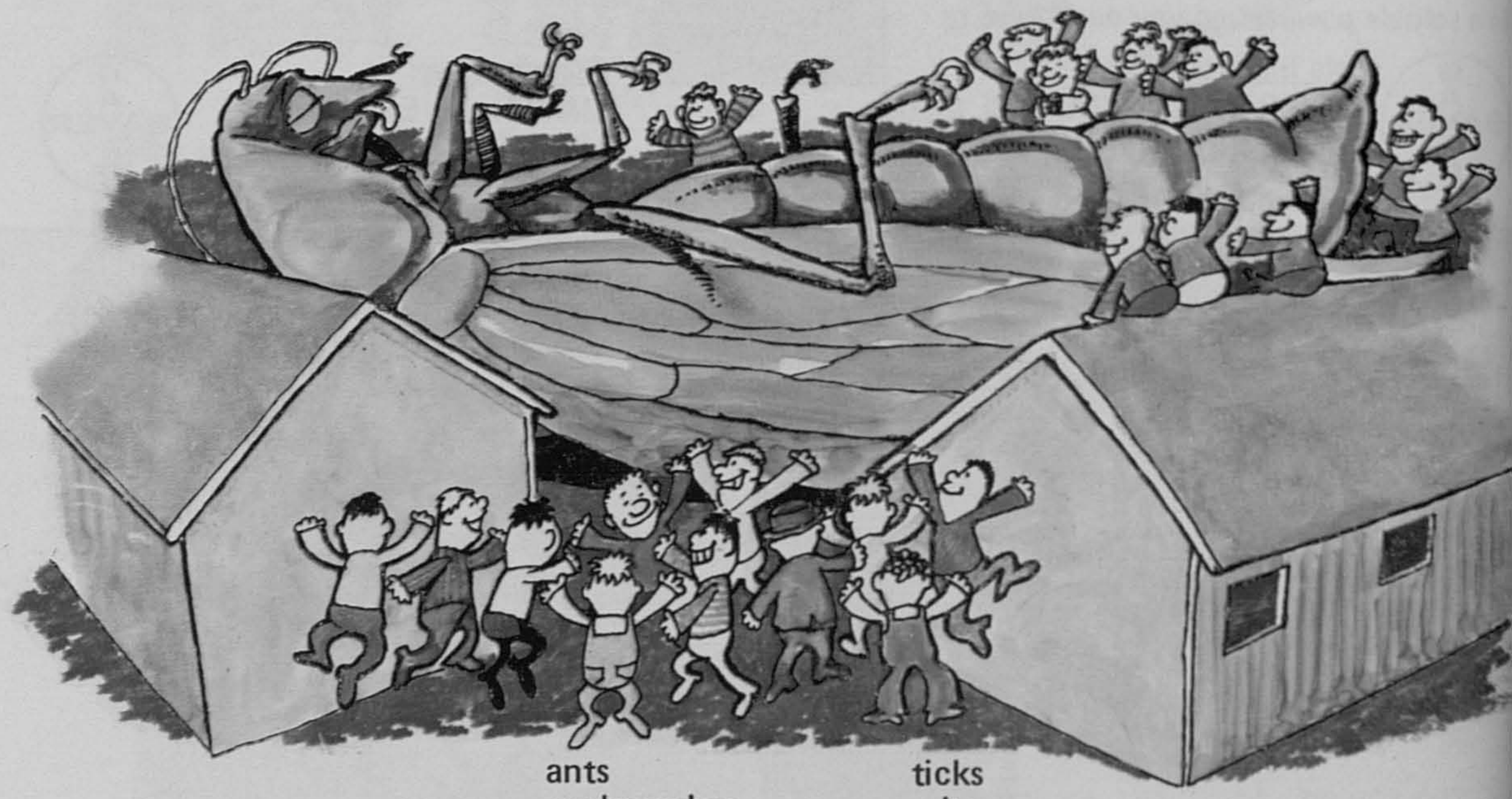

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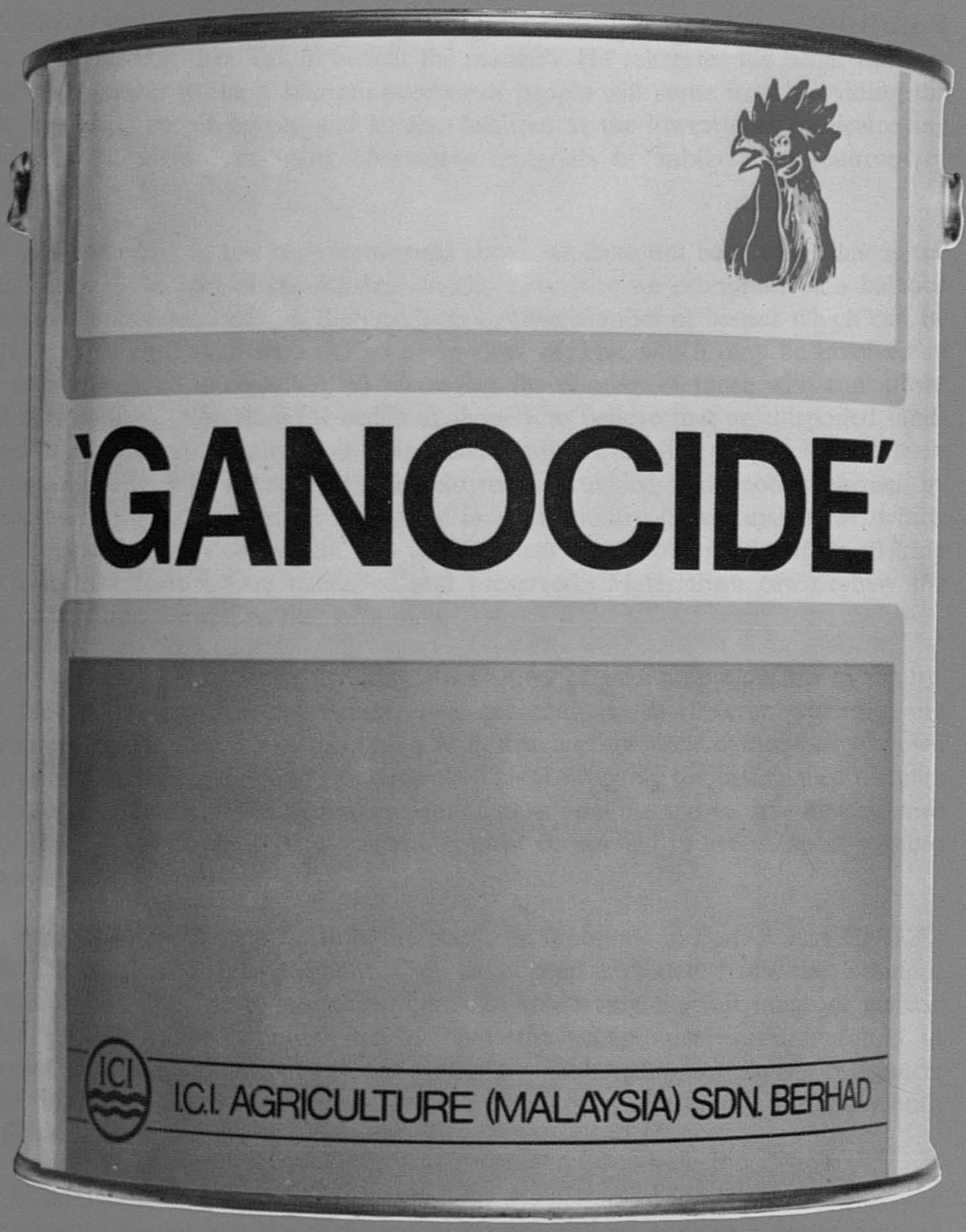

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POSTSCRIPT :

The Malay Mail of 28 November 1972 printed another letter from ENGINEER under the heading 'Let Takun benefit the masses'. He reiterates his belief that the maximum benefit to the maximum number of people will come from providing the maximum number of houses and similar facilities at the lowest cost by destroying Bukit Takun instead of using alternative materials or subterranean sources of limestone.

As indicated in the main comments above we have not been told what is the actual increase in cost of the finished article. Therefore we cannot strike a balance between the increased cost to the purchasers of the number of houses which can be built from Bukit Takun with the larger number of jobs, which may be involved in the exploitation of alternatives, so increasing the number of those who can afford to live in houses. ENGINEER scoffs at those who believe that an unspoiled landscape (not polluted visually) has a significant value, even if it is difficult to assess in money. There is not only the employment provided and money earned by tourism. There is the love for and pride in their country (*tanah ayer kita*), which is so important in a new nation, and that is much easier to engender if its striking and beautiful features are cherished and preserved. Materialism can destroy the soul of a nation as well as that of a man.

In seeking a philosophy for the 20th century of man's relationship to nature, one fact is clear. Over-population, over-exploitation, short term planning and pollution are the means whereby man is destroying not only nature but his own environment. Man is dubiously in control. This is probably the last chance for man to conserve as much of the natural environment as possible and to save himself with it. If this new philosophy is to succeed, it must be applied to every aspect without reservations.

Why don't the biologists study the plants on limestone in Perlis? asks ENGINEER. Endemics (found nowhere else) have been recorded from the Selangor limestone, but that is not the main point. In conserving the full range of genetic variability for future potential use by man, the geographical variants found in different areas are very important, for example when breeding for disease resistance. Purely biogeographic studies obviously need comparison of different areas, say both the Selangor and the Perlis limestones.

If Bukit Takun is saved as it is today for the masses of tomorrow to enjoy, the government will not lose the revenue and no one will go without a house because alternative materials are used. More employment will be created. Perhaps the profits of engineers and contractors may be reduced.

P. R. W.

Planter, Kuala Lumpur **48**: 336–347 (1972)

Conservation in Malaysia

P. R. WYCHERLEY

PART FIVE — BIOLOGICAL COMMUNITIES (1)

Two or more living things together constitute a community, whether they are of the same species or different species. The characteristics of a community derive from the identity of its components and the relationship between the components. Two communities may consist of the same component species, but differ in the relationship between them, for example in one case a particular species may play a minor role but dominate in another. The International Biological Programme and the International Union for the Conservation of Nature attach great importance to preparing an inventory or catalogue of all types of biological community and taking steps to preserve adequate examples of each. The biological communities in Malaysia are many, varied and generally very rich in species. The task of surveying and describing them, so that coordinated and planned action may be taken to save them, is formidable indeed. Moreover there is need for haste before some of the best remaining or even unique examples are lost, owing to the sites being converted for other purposes. Sometimes there may seem to be conflict between conservation of these communities and land development. Therefore various reasons for this ambitious project will be examined.

Plant species

Every crop plant is attacked by pests and diseases. Search among wild plants of the same or related species often reveals individuals which are resistant to one or other of the pests or diseases. Very rarely plants are found which are resistant to most known diseases, but usually different sources of resistance, that is different plants or populations of plants, have to be found to provide resistance against each major disease. Moreover sometimes new races of pest or disease organisms evolve, which are able to attack the hitherto resistant plants, then new sources of resistance must be found.

The plant breeder must then cross the resistant plants with high yielding varieties to produce new selections which combine these desired properties. This can be quite a long term process, with disappointments when resistance breaks down owing to the evolution of new pests and diseases. Despite the time and cost involved and the disappointments, plant breeding is the most important way of raising crop productivity and combating pest and disease. Sometimes there is no other way of obtaining healthy plants or the use of pesticides is dangerous or these and other methods are prohibitively expensive. Improved crop plants are of the greatest advantage to peasant farmers or smallholders, who have neither the educational background nor the equipment to use dangerous chemical or difficult cultural methods.

Therefore plant breeders need continuous access to the whole range of genetic variability represented by wild plants. One or two examples of the wild species in

botanic gardens are not enough. Plants breeders of many crops make regular expeditions to collect examples of wild species to replenish their stocks. They test the new acquisitions against new races of the pest and disease organisms, which may have arisen since the last selection of resistant parents. The destruction of natural biological communities and the rich variation found in them, has given rise to anxiety in the Food and Agricultural Organisation of the United Nations, in case future plant breeders are denied the raw material for their work.

Although many crops are now grown in all tropical countries, the wild species from which they are descended are found in more limited areas. Thus each region or country has responsibilities towards the rest of the world to preserve its own wild flora for posterity. Malaysia is no exception. It is at or near the centre of origin of bananas (*Musa*), relatives of sugar cane (*Saccharum*) and of rice (*Oryza*) many fruit trees (*Artocarpus*, *Citrus*, Durian, Mango, Mangosteen, Rambutan), many spice and drug plants, and several of the ornamental genera of orchids.

At one time all drugs were obtained from natural sources. The usual sequence of events was that the drug became known from the plant extract and later the chemists synthesised the drug or a related compound with similar properties. If the synthetic was cheaper or seemed more effective, then the naturally produced drug would be driven from the market. However, a further stage has been reached in several cases. Resistance to synthetic drugs has been evolved by certain parasites causing disease in humans and domestic animals. It is often found that the original natural drug is still effective against these organisms. The case of malarial parasites and quinine has already been cited. Similar cases seem to be arising for enteric complaints, diarrhea and dysentery, and recourse is again made to extracts of gambier and ipecac.

Some new drugs have been synthesised without a natural pattern, but this is still exceptional. Even when the synthetic replaces the natural drug successfully without any development of resistance, the discovery of the drug in the first place has been a major benefit to mankind, which might have been indefinitely postponed if the properties of the natural drug plant had not been discovered first. In recent years phytochemical surveys have been conducted in a number of countries, including Malaysia, when it was realised how few of the potential sources of new drugs had been investigated. Despite this activity it is recognised that so far only a beginning has been made and the greater part has yet to be tackled. The value of atropine, codeine, cortisone, digitalin, morphine, scopolamine and strychnine when correctly used in medicine to relieve pain, induce sleep or stimulate are well known. Colchicine upsets nuclear division in plants and animals, may there not be some naturally occurring drug to be found which will bring cell division under control and help to remove the scourge of cancer?

These are reasons for preserving as many species and varieties of plants. They are too numerous to be preserved in any other way than by saving representatives of every known type of vegetation. Indeed new species of plants are still being discovered and named, so that no-one could make a complete list of what to try to keep in a botanic garden, which would still be inadequate unless it included the

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variation within species too. Furthermore it is not easy to maintain little known plants, whose soil, light, moisture, temperature, and nutritional requirements are unknown.

Vegetation

Plants growing together make vegetation. Mention was made earlier of the need to preserve examples of natural forest as controls in forest management experiments. The processes of natural productivity are imperfectly understood, indeed it is one of the objects of the International Biological Programme to investigate them. We are just beginning to learn what proportion of solar energy is utilised by crop plants. We do not know how this compares with natural vegetation and what are the causes of any differences which may exist. If we knew these, in whichever direction they lay, we might be able to improve crop production by application of this information. These are reasons to preserve vegetation as a whole as well as its components.

Animal species

There are close parallels to the need to preserve plant species among the animals. Various animals, mainly insects, feed selectively on certain plants or parasitise selectively particular insect pests. If the plant gets transferred to another country without the insect which feeds on it, so that there is no natural restraint in its new environment, it may spread aggressively as a weed. This happened with Prickly Pear Cactus in Australia, Black Sage in Mauritius and Coster's Curse in Fiji, but they were all brought under control by the subsequent import of the respective insects whose feeding is restricted to them. Similarly if an insect pest is transferred without its parasites, it may be much more damaging in its new home, but again can be brought under control by introducing the parasite also.

This is yet another matter of international stewardship; each country must try to preserve the full range of beneficial insects, so that they are available to send to other countries if previous intentional or accidental exports prove to be unwelcome guests. If a plant or insect is kept under natural control here, it will not be recognised as a potential weed or pest until it escapes elsewhere without such control. It follows also that the value of the natural controls will not be recognised until this happens, so that there is no knowing what is wanted in advance. It would be quite possible for a potential weed or pest to be under such good natural control in its country of origin, that it and its controlling insect were present in such small numbers that they could easily be exterminated by habitat destruction, but meanwhile escapes could have built up a large damaging population elsewhere, the prospect of finding the natural control being lost forever.

The potential of Malaysian wild cattle, *seladang* (gaur) and *banteng* (*temadau*), do not seem to have been fully realised either as ranging beef cattle or as breeding stock, although the Bali cattle are derived from the *banteng*. Protein is a major dietary shortage in the region. In such diverse areas as Scotland and East Africa it has been shown that ranging wild deer and cattle periodically culled can produce more meat than grazing domesticated cattle, sheep or goats over the same area. This

warrants investigation here. Tolerance to heat is variable in cattle and so is their ability to convert coarse grazing, valuable genes for these characters may be carried by the wild cattle. Sometimes it is said that crosses between wild and domesticated cattle are impossible, however, this was said of Swamp and Murrah Buffaloes, but it has been achieved. These and other threatened species should be saved for their possible utility to mankind. Preliminary results from the domestication of Sambur and other local species of deer are encouraging that a high level of protein production is possible without the health and feeding problems found with introduced livestock. Fur animals such as the big cats and skin animals such as crocodiles and monitor lizards are being hunted to extinction. This is destruction of a future source of revenue.

The use of animals for research purposes raises moral and humane issues. However, already the majority of people in urban areas and soon most of those in rural areas will have benefited by research on vaccines, antibiotics and numerous medical investigations using animals. All the golden hamsters in the world are descended from one pregnant female. It is a very convenient laboratory animal and its significance for Malaysians is its extreme susceptibility to leptospirosis. By the time a clinical diagnosis has been made, the patient will be very ill, perhaps fatally. There are powerful antibiotics which can effect a cure if given early, but it is unwise to treat with these antibiotics until a firm diagnosis has been made, because there are serious side-effects in some causes which should be avoided unless leptospirosis infection is proven. Moreover these might be the wrong treatment if another disease had in fact been contracted, also indiscriminate use of antibiotics may result in resistance and loss of effect when needed. Nowadays blood is taken at an early stage from a suspected leptospirosis case and injected into a hamster, which rapidly multiplies the leptospirochaetes if present, and dies. Microscopic examination of the hamster's blood shows the leptospirochaetes before they can be detected in the human victim. There may be many other animals equally important for medical research or diagnostic technique waiting to be discovered.

Animal communities

Human populations are growing rapidly, human communities display competition, greed and aggression. Study of these phenomena in mankind is much needed, so that something constructive may be done towards their abatement. However, we find it difficult to study ourselves critically and dispassionately owing to our own emotional involvement. It may be easier to investigate these problems in animal communities, preferably in nature rather than under the artificial restraints of a laboratory. Any chance, however small, that this could lead to the removal of want by population control and the relief of fear by understanding and correcting the causes of aggression, should be seized, which means the preservation now of the living material for such investigation.

These are all practical reasons for preserving representatives of all living things. There are moral and aesthetic reasons too for consideration later. The types of vegetation in Malaysia will be reviewed to indicate the range for conservation.

The main types of Vegetation

Broad types of vegetation are easily recognised. The littoral communities of the beaches and mangrove swamps are our defence against the sea, behind them are found the freshwater swamp and lowland dipterocarp forest, which in turn give way to the dipterocarp forest of the hills, above which are various montane types. Only in Sabah on Mount Kinabalu and other mountains is there any vegetation with alpine elements.

These main types are subdivided into various kinds of natural vegetation usually characterised by the more important timber species present. Areas originally covered by undisturbed, primary or natural climax vegetation have had timber extracted or been cleared for cultivation or mining. After extraction of timber from forest reserves, the trees are allowed to regenerate the forest, although usually various weeding oprations (discussed under arboricides) are carried out to increase the stocking with economic timber trees, so that neither the first nor the final stages of regenerated forest are quite the same as the natural primary forest. The secondary vegetation which develops on land abandoned after cultivation is very different from primary vegetation and it takes many years (several human generations) before anything approximately like the original forest appears. After hydraulic mining the recolonisation of the land is very slow and may remain almost without any vegetation for 5 to 50 years according to the proportion of sand in the soil. Thus throughout the areas naturally covered by the main types of primary vegetation are found parts cultivated and mined, and within the latter parts abandoned to secondary vegetation.

Within the areas occupied by the main vegetation types there are parts where the natural vegetation is different due to geological and topographical factors affecting the soil and its drainage, for example the vegetation of quartz ridges, limestone and sandstone hills, or on the ultrabasic rocks of Mount Kinabalu. These types of natural vegetation, which owe their presence to soil conditions, are called edaphic climax formations to distinguish them from the climatic climax formations, which are the types of primary vegetation determined by the climate of the region.

If the objective of preserving living specimens of all species of plants is to be achieved, then adequate examples of all types of natural primary vegetation, including climatic and edaphic climax formations, must be conserved. It is usually considered that the types of secondary or disturbed vegetation will occur all too frequently and need not be specifically maintained. This is largely true, but certain special cases warrant provision in overall planning. For example, to make valid comparisons of forest management methods untouched forest is required as control and also areas which have been logged and treated in different ways, it is most important to retain the oldest examples of the latter. The wild ginger and plantain type of secondary vegetation arises on the better soils after the milder types of shifting cultivation; the plantains or wild bananas are important material for plant breeding, which may be true of the gingers to a lesser extent. It is important to see that the preservation of this wild ginger and plantain vegetation is not left entirely to chance. It is normally of relatively short duration, soon giving way to *mahang*

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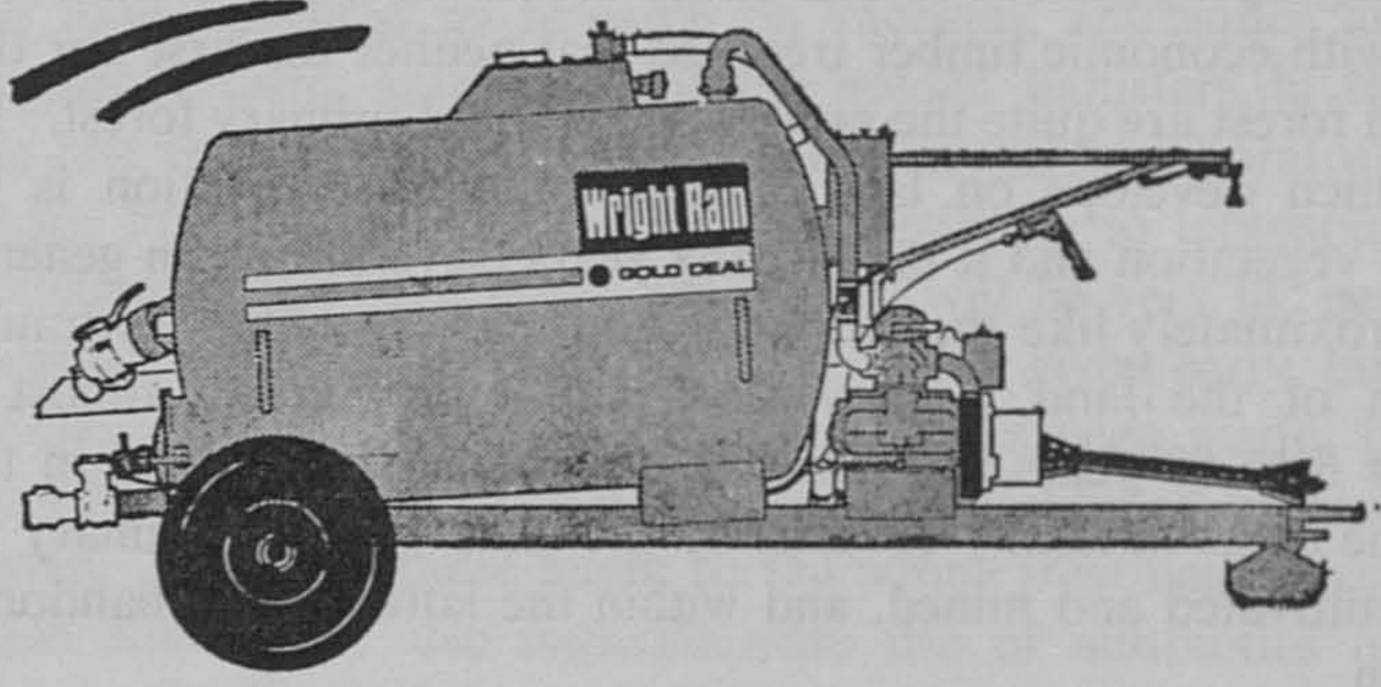

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type *belukar*, and is less likely to appear if the aborigines have to abandon shifting cultivation or modify the method so that *lallang* replaces wild gingers and plantains in the succession. Large herbivores such as rhinoceros, elephant and wild cattle seem to achieve their maximum stocking in some kinds of secondary vegetation, the provision of which may prove essential for their survival.

Mangrove swamps

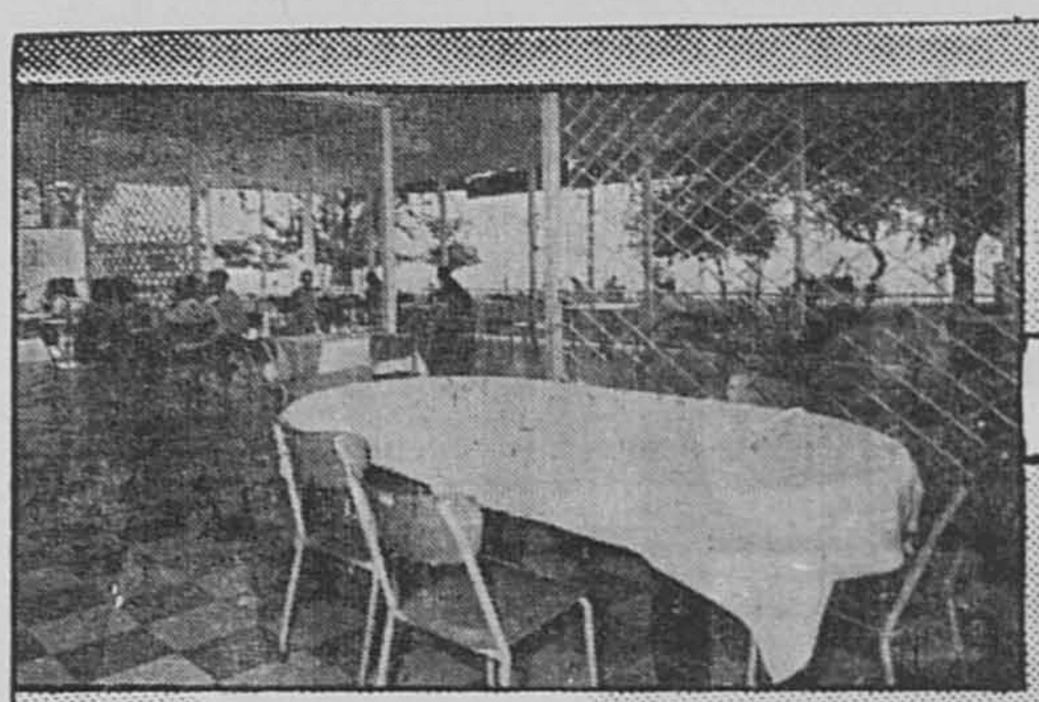
These are the swamp forest flanking the sheltered coasts. Many of the trees produce viviparous seeds, that is the embryo has already germinated before leaving the mother plant; this may speed their establishment in adjacent newly deposited mud, or merely reflect a loss of dormancy where there is no need for it. The zonation of the mangrove vegetation is related to the frequency of inundation by salt water. The pioneer trees, especially *api-api*, the *Avicennia* species, have a web of roots radiating out in the mud from which arise vertical finger-like 'breathing' roots. These pioneers in the areas where new land is being won from the sea withstannd frequent inundation, although it is doubtful if any can tolerate total immersion every day. The next zone is covered by normal high tides but not by the neap high tides, the stilt rooted *Rhizophora* species are characteristic.

The zones inundated by spring tides or by exceptional equinoctial tides only are the most productive of poles for fishing stakes and scaffolding, firewood and charcoal. *Bruguiera* species predominate and *Acrostichum* fern is characteristic of the ground flora, but the number of species present shows a distinct enrichment in the flora compared with the pioneer zones. Prawns improve aeration and raise the land level in the zone covered by spring tides. In the seldom flooded zone some timber species occur, also several palms are found including *Nipa*, the source of the best *atap*.

The major significance of mangrove is that it is an advancing frontier winning land from the sea. The resultant coastal clay soils are often very fertile if properly managed. The fuel resources are renewable provided they are not over exploited to destroy the protective fringe against the sea. Shell-fisheries are valuable. There is fairly rich animal life, including crocodiles and monitor lizards which are now hunted heavily for their skins. Crocodiles are an occasional risk to humans, understandably exaggerated by fear, and their extermination may be viewed with favour by some. Nevertheless they seem to play an important role in controlling the number of monkeys (*kera* and *lotong*) and to a lesser extent of wild pig, which would otherwise increase and raid more often the crops on the adjacent drained fertile coastal clay soils. The reptile skins are a valuable export, whose hunting and cropping should be carefully controlled if this source of revenue is to continue.

Beach Vegetation

Whereas the mangrove forests are usually accreting new land if undisturbed, the strand vegetation of exposed sandy and gravelly beaches may be in accretion or recession. Where the land is advancing creeping herbs such as bindweeds, legumes and grasses are found with a fringe of *Casuarina equisetifolia* or *ru* trees. Behind this is mixed woodland or a grass and sedge community, the latter if grazing



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is heavy. The woodland includes various trees such as *Terminalia catappa, Calophyllum inophyllum* and *Barringtonia asiatica* (*ketapang, penaga laut* and *putat laut*), which are left fringing the sea strand if the shore is receding. Human activity often ensures the replacement of the woodland by coconut groves, but these are usually low yielding. Where the coast is receding rapidly, coconut palms or beach woodland trees are commonly found leaning onto the beach.

Perhaps because there are few timber species and other economic products from this beach forest, its management seems to have been neglected. The sandy beaches are much more popular seaside holiday areas than the muddy mangrove swamps or slimy rocks or sharp coral. Therefore the strand vegetation is much disturbed at popular resorts near large towns. It is probable that holiday makers are speeding the rate of regression. Much as controls may be irksome or engineering works unsightly in the early stages, it is not too soon for precautions to protect the sandy beaches by groins and their fringing vegetation by rotation of public access, as easy transport brings them within the reach of ever greater crowds. Otherwise this amenity may be lost and the coast line left raw and unsightly. The undisturbed beach succession is one of the simplest to study in the tropics, (and is free from the unpleasant conditions of the equally simple mangrove), therefore some examples should be retained for training teachers and students.

Heath forest

This is the vegetation of old raised beaches with podzol soils left after prehistoric falls in sea-level. There is little of this left undisturbed. It easily degenerates. It is alternately dry and water-logged so that the *gelam* association which can tolerate both fire and swampy conditions is often found in such situations today.

At Padang Mulud on the east cost of the Penggerang peninsula a small area of heath forest survives, little disturbed on a raised beach in association with an example of seasonal swamp forest in its own drainage basin, so that this complex would make a good reserve which would not interfere with or be modified by major land developments projected elsewhere in south-east Johore. There are other small examples of heath forest worth saving at Tanjong Hantu, Dindings, on the west coast, and at Jambu Bongkok, Trengganu and at Menchali, Pahang on the east coast of Malaya.

Swamp forest

There are two main types of freshwater swamp forest; firstly the *lopak* or alluvial type fed by streams and rivers, secondly the peat swamp type, which when fully developed receives only rainwater and as its name indicates builds up a much deeper layer of peat. In areas of high rainfall the alluvial type may be followed by the peat swamp after the vegetable remains have built up the soil level above that of the river water level. Both alluvial and peat swamp forests occur in both East and West Malaysia, but the peat attains its greatest depth and the forest its most extreme form in Sarawak.

Some timber species are valuable and highly productive, forestry may prove the best land use for peat swamp forest. For the general reasons already given some areas of the other types of swamp forest should be retained, where water levels have not been unduly disturbed. *Gelam* (*Melaleuca leucadendron*) is common where alluvial swamp has been heavily disturbed, especially if the water is brackish as mentioned under mangrove. *Gelam* produces plenty of firewood and charcoal. In places, such as on the margins of Tasek Bera, the great inland lake in Central Malaya, palms, *rotan*, screw pines (*pandan*) and sedges predominate. The direct economic value of this community is probably low, but its indirect value for fish production may be more significant. Its ecological interest is great and its genetic reserve potential as yet unknown.

River banks and fringes

Except where human interference has destroyed it, there is a distinct vegetation fringing the rivers. This strip may vary in width from a single line of trees on the river bank to broad mangrove swamps flanking the river estuary and merging with those along the coast. Neither the pioneer mangrove nor the river bank fringe is rich in trees of direct economic value. The main exception to this is the *nipah* palm, source of the best *atap*, which occurs extensively alongside the brackish tidal waters of the upper reaches of wide estuaries. The valuable mangrove is behind the pioneer fringe. The valuable forests and agricultural land are behind the river banks, which protect them.

Moving upstream from the mangrove and *nipah*, a belt of *rassau*, characterised by a screw pine and associated species, is passed. Then for twenty to a hundred miles according to the width of the lowland plain, gallery forests fringe and overhang the rivers in their natural state. The name gallery is derived perhaps from the resemblance to a choir gallery overhanging the nave of a gothic cathedral. Where *Dipterocarpus oblongifolius* is the main tree species, the Malay name *neram* may be preferred for this type of forest.

Beyond the usually fairly broad smooth flowing rivers, the rocky streams are reached. These are bounded by bamboos or by *Saraca* trees (*gapis* or *golak* in Malay). The related tree *Saraca indica* is known in its homeland after the Emperor Asoka, who turned from war and planted trees as a more satisfying way to establish his memory. Whichever of *nipah, rassau, neram, gapis* or *buloh* vegetation fringing the rivers and streams is concerned, the law in most of Malaysia requires that it be left uncut and undamaged in a defined strip along each river bank. This law is frequently not observed, nevertheless the law is on the statute book and nature has provided the fringe vegetation, both are there for a very good reason, simply to provide the mutual protection of the river and the agricultural and forest lands adjoining it.

The reader may turn to the first chapter to recapitulate the basis of water and river conservation. The situation is typical of many; the conservationist, scientist and plant breeder wish all types of vegetation to be preserved according to their general principles, but equally putting this into practice will afford protection of much more.

As a bonus, many of the best wild orchids for breeding purposes are found as epiphytes in the *neram* and *gapis* river fringes, especially near waterfalls, some of which are scenically beautiful in their natural setting.

Inland dryland forest

The vegetation of the coastal fringe and immediately behind it has been considered and also the swamp and river communities. The broad classification of the inland vegetation follows altitudinal zones modified by soil and climatic factors, examples of the latter are where the influence of the monsoons is marked or minor. Foresters consider the lowlands to extend to about 1 000 ft (305m) above sea-level, agriculturalists have usually taken a somewhat lower level about 750 ft (230 m), because this is the common limit of rubber and oil palm, however, geographers and land capability planners are increasingly using the 'steep land line' mentioned earlier, which varies from district to district. However, the foresters will be followed in this section.

The greater part of the inland lowland dryland forest can be described as lowland dipterocarp forest, which is characterised by the majority of large trees which emerge above the lower forest storeys being members of the family Dipterocarpaceae, many of which are the most important timber trees. The main exceptions are the specialised vegetation of quartz ridges and limestone hills, most of the latter are less than 1 000 ft high, and some marginal forms characterised by leguminous trees sometimes with *kedongdong* (Burseraceae).

Lowland dipterocarp forest

In Malaya various sub-divisions have been recognised according to timber species of importance. Similar studies are proceeding in East Malaysia, but exactly the same classification is not applicable in each country. The Malayan types are quoted to illustrate the range in such a relatively small area.

Keruing forest is characterised by the large proportion of *Dipterocarpus* species. Water-logging occurs occasionally and the community is probably marginal to freshwater alluvial swamp. *Keruing* timber is medium hardwood.

Red *meranti-keruing* is named after a group of several *Shorea* and *Dipterocarpus* species which are light and medium hardwoods. This forest type is common on lateritic soils, which may indicate impeded drainage but not to the extent of water-logging as in *Keruing* forest; the two types merge into each other.

Most of the other types occur on fair to well-drained soil, and are separated in different areas probably due to climatic and perhaps soil differences. These forests produce the most valuable timbers and the lands are under the highest pressure for agricultural purposes because the soil is usually deep and well drained. *Chengal* or *Balanocarpus heimii* is Malaya's best known and one of the heaviest hardwoods. This very valuable timber species is most common on rich soils in mid-and north Malaya (except in Perlis); it is especially common in the foothills where these are called *Chengal* forest. Another heavy hardwood is *damah laut merah* (*Shorea kunstleri*) which has given its name to a forest type also found

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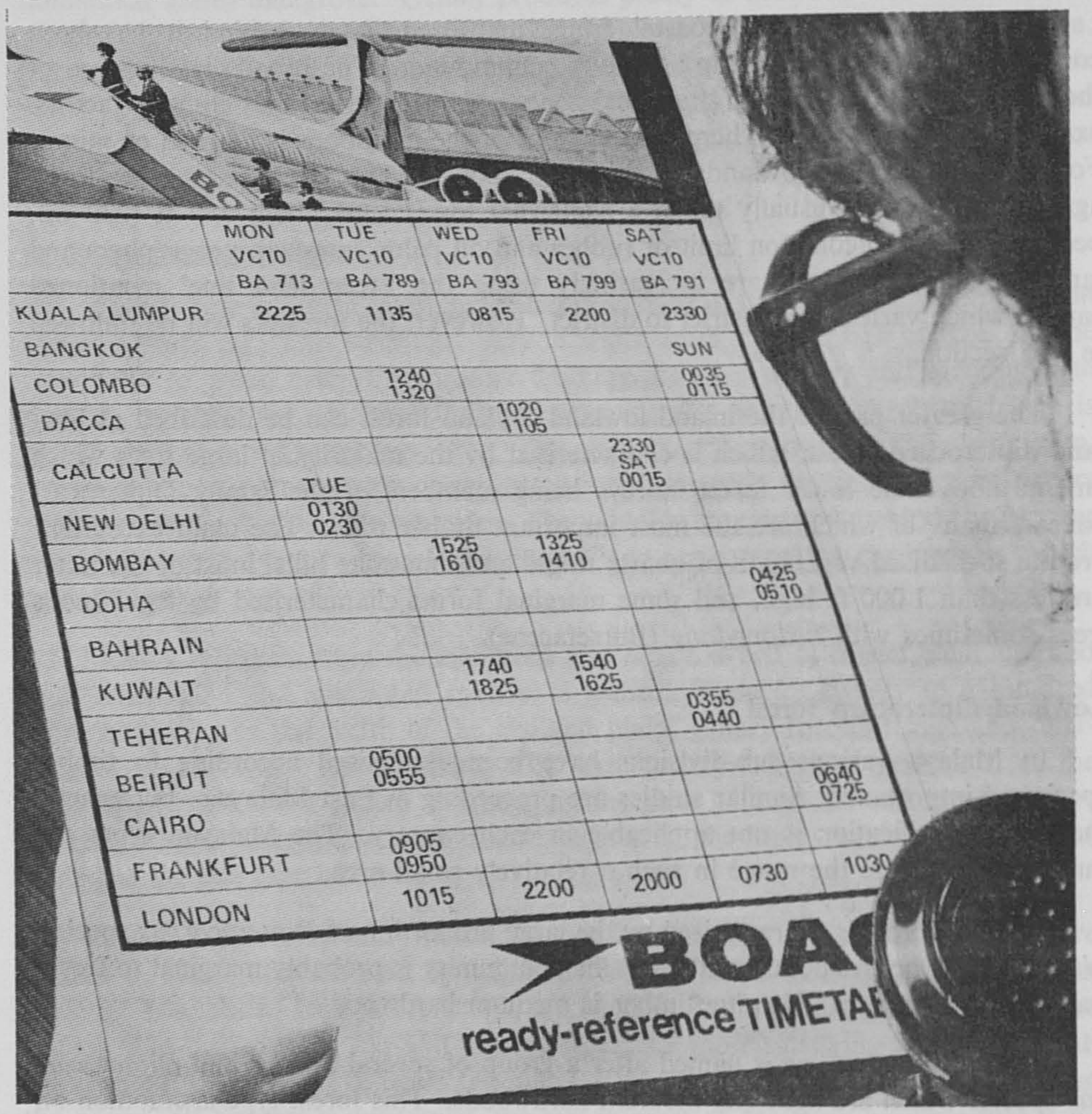

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mainly in the north. *Balau* forest named after a group of *Shorea* species yielding heavy hardwoods is more common in the southern and eastern half of the country. None of these forests—*chengal, damah laut merah* or *balau*—is dominated solely by the characteristic species, which in each case is simply more common among the emergents and valuable timber species present. Many other tree species are present in all canopy layers of storeys of the forest. This is very different from the temperate regions where one species may form a pure stand.

Kapur forest is about the only type to approach single species dominance among the lowland dipterocarp forests. *Kapur* (*Dryobalanops aromatica*) is a gregarious species, which flowers and sets seed more often than most dipterocarps, some of which may not seed for seven or more years. The natural range of *Kapur* is near the East Coast of Malaya. There are small almost pure stands of *Kapur* in Selangor and Negri Sembilan. No one seems to know how they got there, perhaps planted by aborigines. Their exceptional purity suggests artificial aid.

Nemusu forest is also widespread in north-west Malaya, where it is replaced by the mixed white *meranti-gerutu* forest. The latter is rich in species typical of the monsoon areas further north. There are many other types of lowland dipterocarp forest still ill-defined or considered to be intermediate forms.

Non-dipterocarp lowland forests

The non-dipterocarp lowland forests, that is those in which dipterocarps do not form the larger proportion of the emergents, are less valuable economically because most of the preferred timber species are dipterocarps. Circumstances such as supply and ease of growing may cause some changes in preferences in future.

Kempas-kedongdong forest is named after the large leguminous tree *Koompassia melaccensis* (*Kempas*) and a variety of trees in the Burseraceae, mainly of the genera *Canarium* and *Santiria*. *Kempas* is a medium hardwood but the *kedongdong* group are light hardwoods, all have some undesirable characteristics which detract from their worth as first quality timbers. The forester is less concerned with conservation of this forest type because of its low economic value and since it occurs usually on poor swampy soils there is less pressure to convert it to agricultural purposes. Nevertheless it should not be omitted. from the plan to conserve representatives of every type of vegetation recognised because no one wants it or the land it occupies at present. Furthermore some of the defects of *kempas* and *kedongdong* timber can be overcome with modern treatments, so their relative value may increase in future, especially if supplies of the currently preferred timbers are exhausted later. Impregnated *kempas* is currently much used for railway sleepers, especially in Australia where there is a large market for this Malaysian product at present.

The situation is much the same with the *merbau-kekotong* forest of the foothills characterised by several leguminous heavy hardwood species of *Intsia* and *Cynometra*. *Merbau* timber is of growing importance and this type of forest is often along the border of agriculturally desirable land. There is opportunity to

manage such forest for its timber and its wildlife in such a way that it forms a protective boundary for plantations on the one side and wildlife on the other.

Some classifiers of the vegetation do not separate these non-dipterocarp lowland forests from the main lowland dipterocarp formation. They regard the non-dipterocarp types as extreme variants of the dipterocarp formation, because there are so many intermediate transitional types. However, the forester must often devise different methods of management for these types and the conservationist needs to recognise them too in order to preserve as wide a range as possible.

Specialised lowland vegetation

The specialised vegetation of quartz ridges and limestone hills is poor in economic timber species and the small quantities present are difficult to extract. Some timber trees including *Agathis alta* are more common at the foot of quartz ridges although not actually on them. Some quartz ridges and limestone hills are entirely below 1 000 ft (305 m), that is they are within the arbitrary limit of the lowlands. Others straddle or rise through this artificial division and yet other quartz dikes and limestone outcrops are entirely above it. The vegetation of these specialised habitats is determined largely by their peculiar environmental features irrespective of altitude. Thus although these features may occur within lowland forest and provide an additional reason for conserving a particular area, the vegetation of specialised habitats will be considered as a separate problem, intermediate in some ways between lowland and hill forests and separate from either in others, they are largely free from agricultural pressures, but sometimes exploited for minerals. The general problem of lowland forest conservation will be discussed first.

Virgin jungle reserves

Foresters have always appreciated the need for untouched portions of forest as controls for their experiments, which serve also as living museums or genetic pools. They have set aside one or more virgin jungle reserves to be kept entirely unfelled in each of a number of the 400 forest reserves. Originally there were over 70 virgin jungle reserves in Malaya varying in size from 25 to over 4 000 acres (10 to 1 600 hectares), the larger ones being catchment areas also, the usual area being about 300 acres (120 hectares). This is entirely a departmental arrangement and if the forest reserve as a whole is alienated for other purposes, usually for agriculture, the virgin jungle reserve is lost with it. This has already occurred in a few cases and others are pending.

Despite the inroads already made, there are reasonable prospects of finding examples of all the major types of primary lowland forest in those virgin jungle reserves still surviving, especially if supplemented by new ones in forest reserves lacking them. However, if forest reserves are felled and planted with other crops in an unco-ordinated manner, the last examples of some particular community may easily be lost. Furthermore the smaller virgin jungle reserves cannot survive as entirely isolated islands, they must have a cushioning boundary belt, ideally of forest, although it will be felled, treated and regenerated forest in

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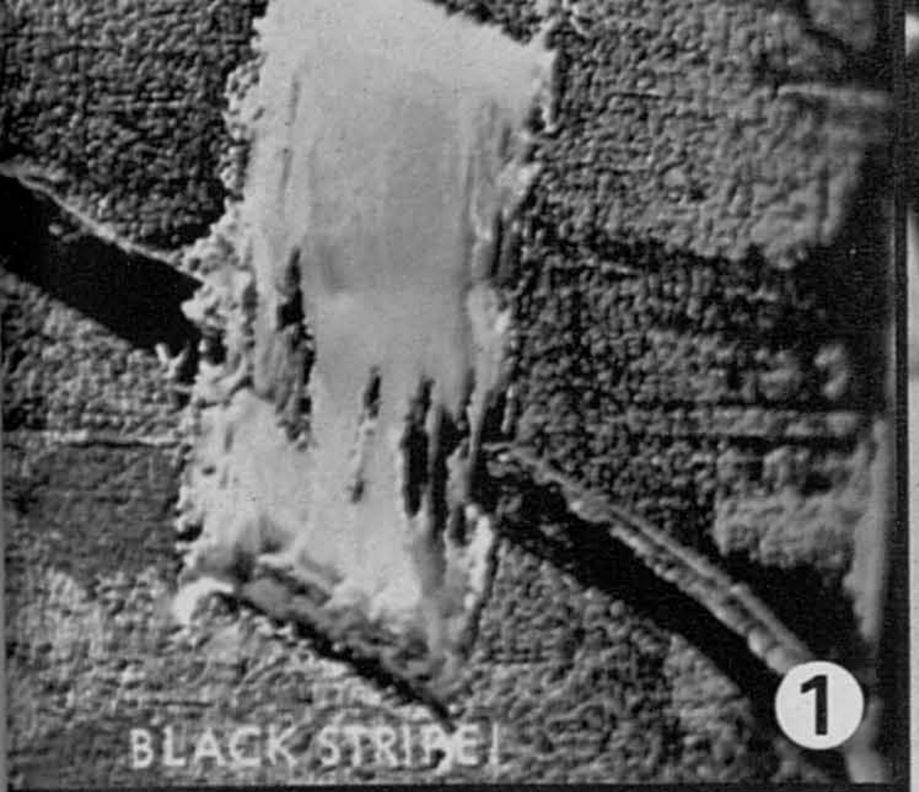

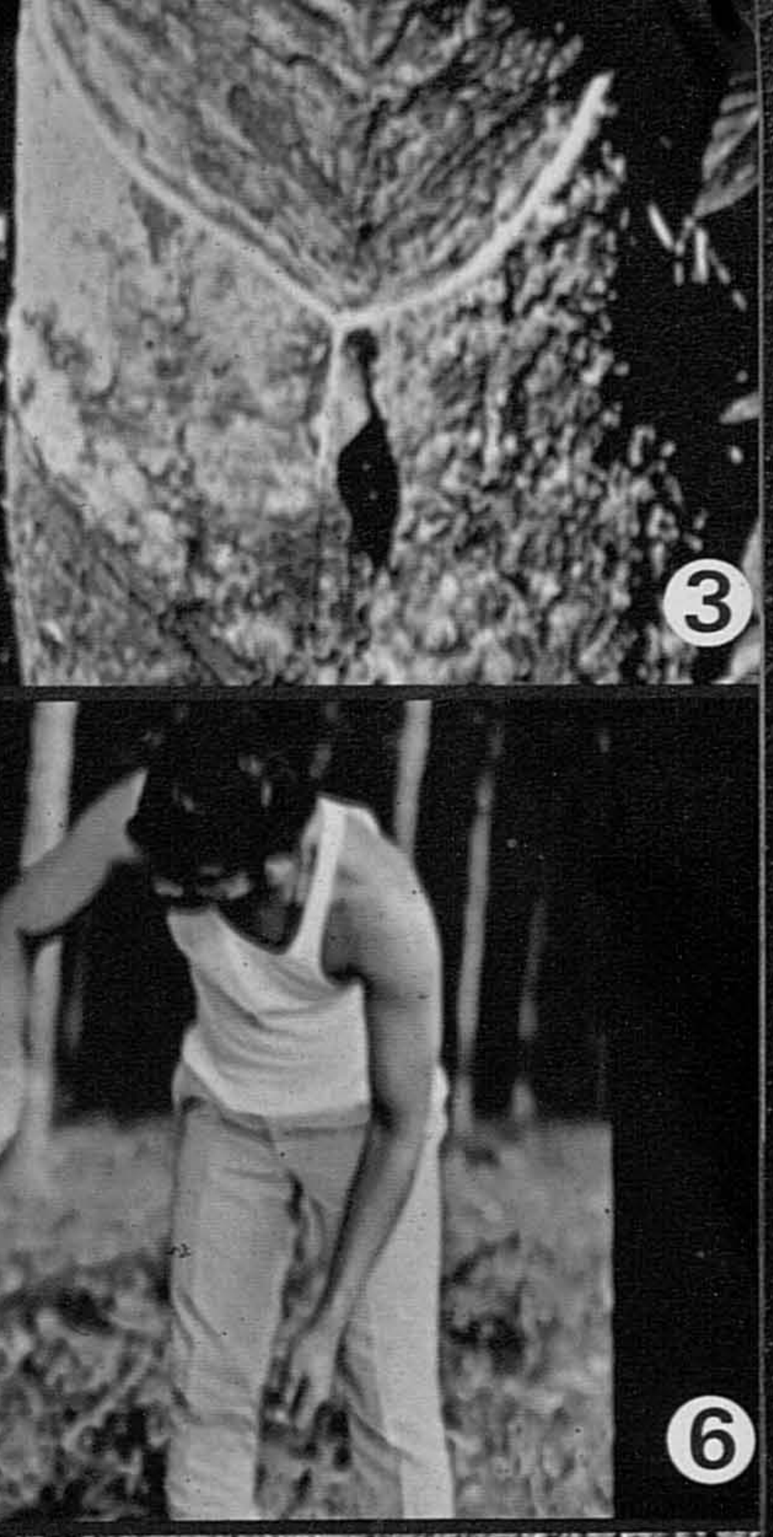

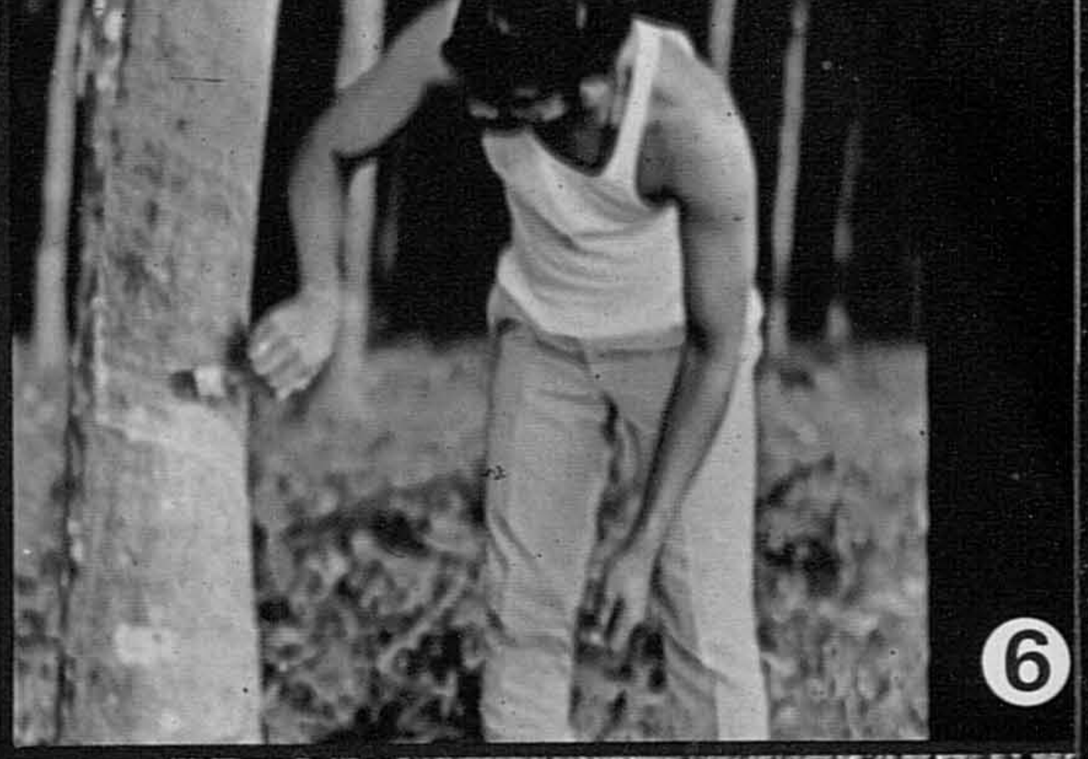

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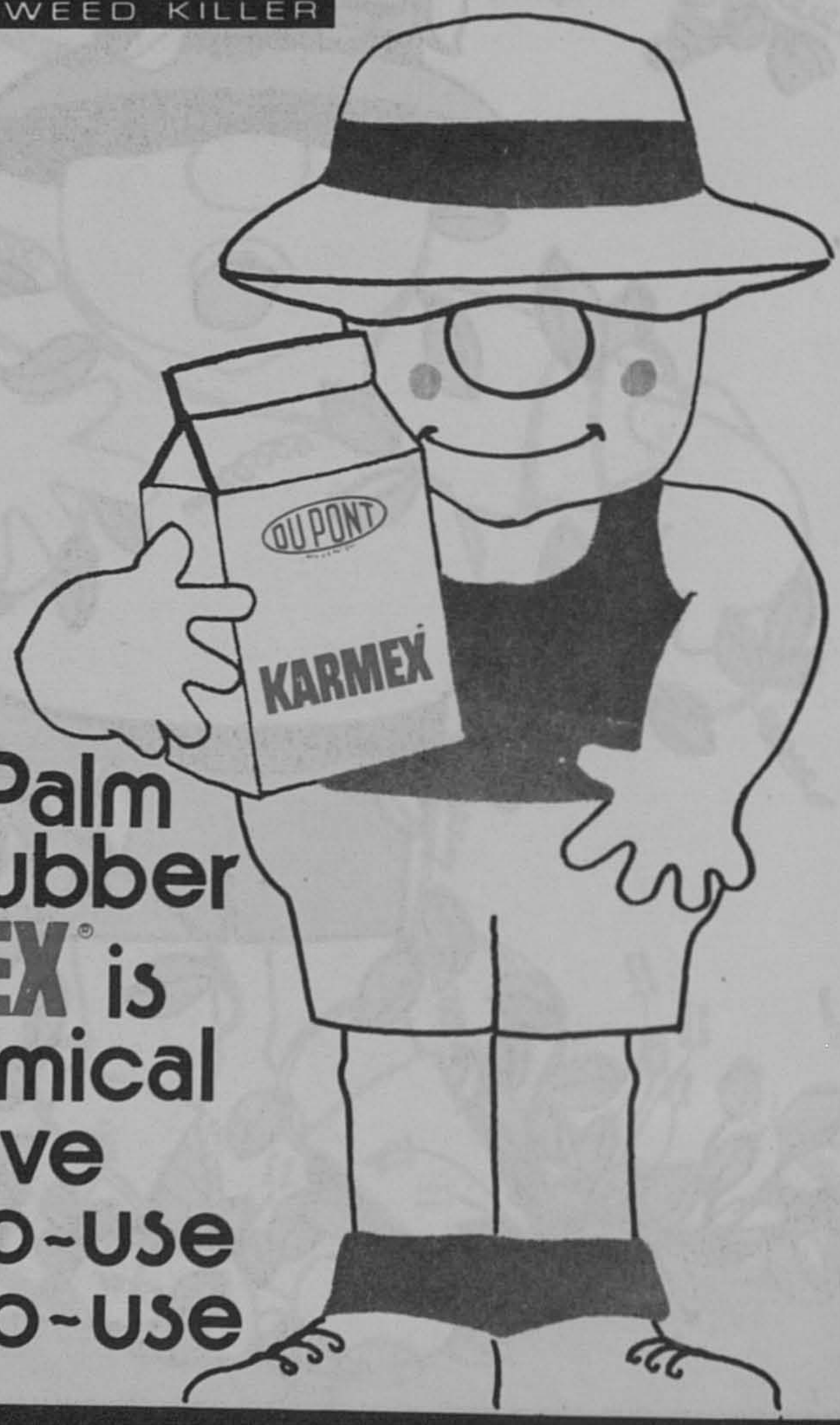

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most cases. It is not easy to define a minimum area for an effective reserve, either to be adequately buffered against the external environment, in particular the lateral penetration of strong sunshine and drying winds, or on floristic grounds. About 100 tree species are found in an acre (0.4 hectare) of undisturbed dipterocarp forest or 250 in 5 acres (2 hectares), each represented by an average of only five individuals, the rarer by only one or two. Some of the largest virgin jungle reserves covering catchment areas can survive on their own. The majority of intermediate size would be most secure if surrounded by productive forest, however, a compromise may have to be accepted in certain cases. For instance if a virgin jungle reserve is the unique remaining example of a particular forest type surrounded by very valuable agricultural land, it would be better to surround it by tree or palm crops as a partial protection than to lose it altogether or to provide no shield at all.

Several virgin jungle reserves have been selected to coincide with natural salt licks visited by wild life. They all have enduring educational, scenic and recreational values in addition to their basic scientific worth. Some are catchments. The need is to classify the virgin jungle reserves according to forest type, to take into account all the other existing and potential attributes, such as providing a wide regional distribution of parks in easy reach of all centres of population, and to make definite recommendations which should be protected in perpetuity. Private individuals, associations like the Malayan Nature Society and official projects such as the Land Capability Classification and the Conservation Section of the International Biological Programme, are all tackling this problem from their respective approaches. It is a complex task and time-consuming if a fully comprehensive survey is to be made, meanwhile pressure on land continues, therefore some compromise between the ideal complete knowledge for decision making and the urgency of making decisions must be adopted.

Saving the virgin jungle reserves for posterity should conserve a large proportion of plant species, many invertebrates and smaller warm blooded animals. However, even all the virgin jungle reserves together would hardly support one tiger or one elephant and, fragmented as they are, they cannot support a single large animal. The extent to which the larger forms of wild life can adapt themselves to the conditions of managed productive forest, which will surround the virgin jungle reserves in most cases, is unknown. The most promising approaches to saving the large mammals will be discussed under National Parks.

(*Next month:* *BIOLOGICAL COMMUNITIES* contd.)

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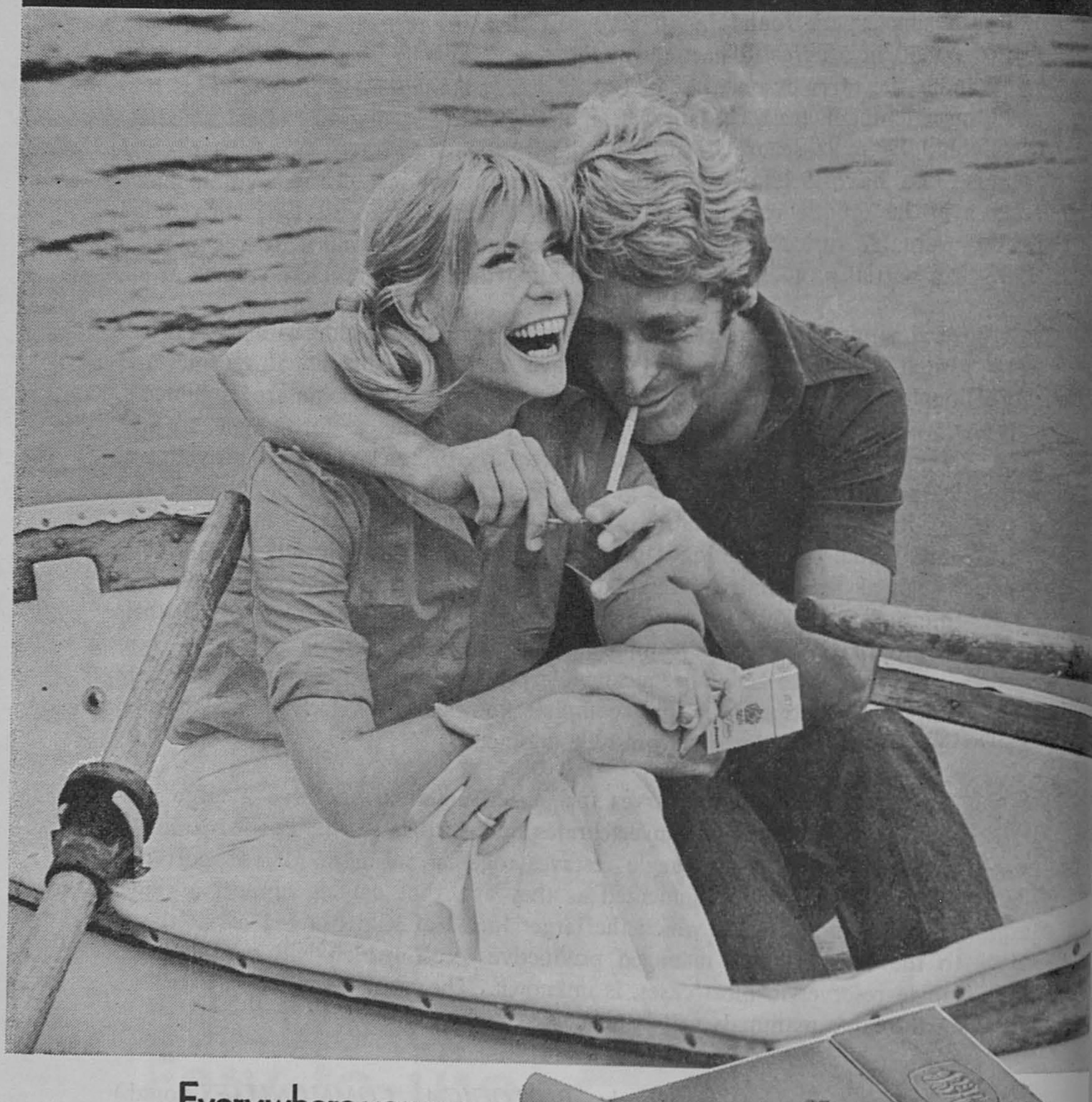

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The monthly crop

The total number attending the Oil Palm Conference reached 733—a hundred more than had registered by the due date and we thought we had room for. A queue of late arrivals began to form in the conference office early on the first day and the extent to which we had gone 'international' was soon clear. Such pleas as 'But I've come all the way from Belgium!' and 'My embassy said they'd arranged everything!' vied with 'I wrote to you from Colombia weeks ago!' and 'But you *must* let him in, he's my *Chairman!*'. In the end there was only one thing to do: throw up our hands in resignation and, in one smooth movement, bring them down again to collect the entry fees.

There were some light-hearted moments in the conference and Mr David Wan's running commentary on his film of harvesting with buffaloes was constantly diverting and at times hilarious. A good, robust four-letter word found its way on to the tape during this commentary and was unblushingly reproduced by the ladies doing the transcription. Only twice were they baffled by foreign accents; once when a session chairman suggested that speakers start "chewing at the microphones" (he meant 'queueing') and again where a leading protagonist of the Wan paper mentioned above, said he thought it was "pathetic", (he meant 'prophetic').

Mr Andrew Taylor, past Chairman and Secretary of the Society, and a Fellow, celebrated his 75th birthday on 21 November. A large number of planters and ex-planters all over the world will join us in wishing him many happy returns. His friends will be glad to hear that he is well, and enjoying a life of slippered ease at Rumah Bintang, Batu Caves, Selangor; about 9 miles from Kuala Lumpur.

The Scottish mind according to Patrick Ryan writing in *Punch* 'is inhabited by the Peculiar Haggis Hallucination which leads the sufferer to believe that this flaccid lump is his native ambrosia', and now that we have our Scottish readers sitting up bug-eyed with fury, here's more of the same: 'Its recipe openly proclaims it to be a type of Boiled Butcher's Dustbin. The Scots make haggis from those intimate parts of animals which all other nations but the vultures throw away . . . it is a sort of Offal Steamed Pudding which looks like a pale castrated bagpipe, tastes of savoury cardboard, and is monstrously productive of the wind.'

By chance there was a story going round* at the Oil Palm Conference about this very dish. An important American visitor to Britain was being entertained by a group of Scottish businessmen and was gazing thoughtfully at a portion of haggis which had been placed reverently before him. 'Have you eaten haggis before?' his host enquired. 'No' replied the visitor 'though I guess I may have trodden in it a couple of times.'

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* There was in fact another : something about a lady who had led a life of such promiscuity that they had to bury her in a Y-shaped coffin; but this is stretching things too far.

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Miss Anne Wong is a very good racing driver who can belt a Mini-Cooper round the Selangor Racing Circuit in less time than it takes most men. She also writes a sensible motoring feature in *The Sunday Times*, and from a recent issue of this we conclude that all that arm twisting on full lock has wrought havoc with Anne's anatomy, as 'Recently' she wrote, 'I was asked to give my opinion about two books on motoring. So, I duly put them under my arm and looked through them.'

This month's recipe, that of a very popular Indian dessert, is too short to claim a page all to itself. If you want to have a go at *kayserie*, turn to page 364.

'Certain kinds of executives seem to be intimately associated with labour trouble..... In particular, the difficulty seems to flow from five traits.....' and an executive possessing some of these traits, being in a decision-making spot with regard to employees, is likely to enhance labour trouble no matter what the money situation is—in fact money is by no means the only cause of labour disputes.'

So began an article in *Rubber World*, June 1972, p. 38, by A. A. Imberman, an American authority on management and a personnel consultant to major American companies.

The traits are: motivation by prestige or salary rather than actual achievement; resentment of and efforts to circumvent unpalatable decisions of superior management; inability to coordinate all the resources of management; undue self-satisfaction; a disposition to haggle over details rather than see the whole picture.

The remedy is to listen, systematically and deliberately, to the realities, often intangible, of the employees' working life, to their sentiments, hopes, fears, and desires. The dynamic listening should embrace all employees, operatives, staff, managers. 'It doesn't come natural to all of us' says *Rubber Journal*, (from which the above is taken), 'but we are learning.'

There was absolutely no call for Reuter's correspondent at the Conference to get so personal. Reporting in *The Malay Mail* (20 November) he wrote that 'the conference discussed topics covering planting expansion, weed control, nutrition, and *breeding by the Incorporated Society of Planters.*'

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Book review:

The British in the Far East

by G. WOODCOCK, pp 245, Weidenfeld & Nicolson, 1969. M$35.00

This book is one of a series dealing with the social history of the British overseas which together present a much truer perspective of the British Empire than normally comes out of history books.

As pointed out this is because although the Empire endured for a relatively short time politically, British influence, geographically and historically covered a much greater span than political history suggests.

Other great Empires, like the Roman, declined gradually and their demise was the slow death of old age. But the British Empire came to its end with a startling suddenness as though electrocuted on the spot.

Not only was it startling to the rulers themselves to wake up and find themselves without an empire but frequently this was even more surprising to the ruled. The traumatic experiences of West and East Africa and of India and Pakistan since independence bear good testimony to this.

But this book is concerned as much with the individual, both those who made history like Raffles and Rajah Brooke as well as the lesser names who never made the history books, as with the purely historical aspect.

Almost as surprising as the rapid end of the Empire was the frequent ease with which it was established.

Francis Light, promoted to Captain in the East India Company's Marine for the occasion occupied Penang with a force of one hundred and fifty men only twenty of whom were Europeans. Raffles did the same with Singapore with a force twice as large but with only thirty British officers.

Admittedly no opposition was expected since negotiations had already taken place, but even in 1819 a single battalion of Bengal Native Infantry was considered all that was required to garrison not only Penang and Singapore but also Bencoolen.

The belief that all that was necessary to maintain the British Raj, sometimes in areas as large as the British Isles itself, was a couple of Europeans and a handful of native troops received a rude shock after the Indian Mutiny. But even up to the last days of the Empire the number of British administrators was infinitesimal compared with the number of people and the area administered. In India for instance a mere 5,000 British officials ruled over 300 million Indians.

Contrary to popular belief the acquisition of Empire was not a deliberate act. In most cases it was forced upon an unwilling government by business interests and charismatic characters like Raffles and Rhodes.

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NUTRIENT REMOVAL CHART
Pounds of nutrient per acre used by various crops

	Nitrogen	Phos-phate	Potash	Mg.	Sulph
Banana plants/ acre (1200)	400	400	1500	156	•
Coffee lbs/acre (1784)	27	4	43	61	16
Oil Palm lbs/acre (13382)	80	18	120	18	•
Pineapple plants/acre (15000)	134	170	535	53	•
Corn bu/acre (100)	150	60	125	33	22
Tobacco lbs/acre (2000)	75	15	120	18	14
Grain Sorghum lbs/acre (8000)	260	110	220	36	38
Rice lbs/acre (6500)	135	51	18	15	18

*No information

The Sul-Po-Mag nutrien

(nature's natural combination of magnesium, potash and sulphur)

While most farmers are familiar with the needs for nitrogen, phosphate and potash, they are sometimes surprised to learn how important other nutrients can be in the diet of a growing plant.

SPM SUL-PO-MAG ®

Magnesium and sulphur often deserve special consideration. As the chart above shows, some crops need *more* sulphur than phosphate and some crops need more magnesium than nitrogen. All crops need both sulphur and magnesium and if these needs cannot be provided by your soil, crop yields and quality can be seriously reduced. Here's why:

Stimulates Growth

Proper magnesium balance stimulates growth. If a plant is deprived of magnesium, all growth processes will be slowed, and the plant will be unable to produce high yields.

Improves Quality

The addition of sulphur can improve the quality of crops. Without sulphur, proteins cannot be formed, thus, crop quality can suffer.

Deficiencies are Widespread

Magnesium and sulphur deficiencies have been observed in every major crop and in most crop-production sections of the world. And in many cases Sul-Po-Mag has been used to help correct these deficiencies.

Use Sul-Po-Mag

Sul-Po-Mag is a natural combination of available magnesium, sulphur and potassium, and it is essentially chlorine free. Although it is 100% soluble, Sul-Po-Mag does not leach out even in sandy soil. This means the nutrients are available for plants throughout the growing season. It can be mixed with your regular fertilizer or it can be applied directly to the soil. Sul-Po-Mag will not affect the soil pH.

Please check with your local IMC Representative about the best methods of application and proper application rates for your area.

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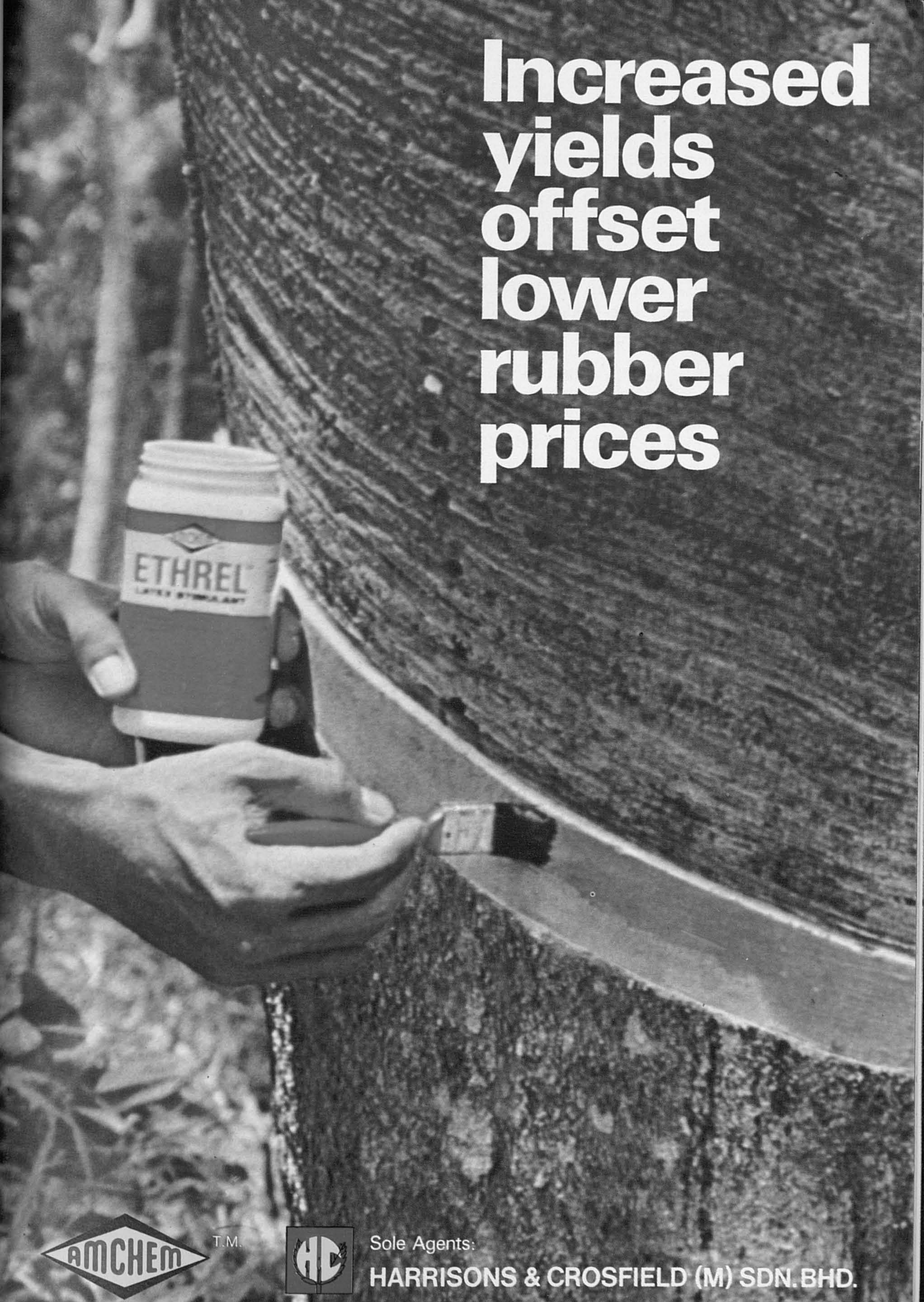
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The marching legions of Rome which established that Empire throughout the Mediterranean littoral and beyond, finds no corrollary in the establishment of the British Empire. It was the traders and later the cotton mills of Lancashire which led to the acquisition for British of a quarter of the world's land surface and a quarter of its population.

But life was not easy for the early traders whether on the China Coast, Bencoolen or in India itself. In Bombay it was said that two monsoons were the life of a man and at most stations cholera, smallpox, typhoid and dysentery were endemic.

There were other problems too, as Collet, one of Raffles officers at Bencoolen made plain. He wrote to his friends that there were only four white women in the settlement; 'one was a lunatic and kept confined in a dark room, another was a termagant whom he was sending away for her husband's protection, the third was a young woman as well shaped as a Madagascar cow and the fourth a woman of the most indifferent personage but yet of consummate virtue.' Obviously it would have been a brave or desperate man who made his choice from among that lot. Collet, however, was careful not to recommend the obvious alternative. Asian women were a great danger he advised, and 'a man that ventures on them seldom fails to get the Bencoolen fever.' Be that as it may it is hardly surprising that many preferred 'Bencoolen fever' (whatever that may have been) to a Madagascar cow, for the settlement became increasingly peopled with Eurasians.

The traders on the China coast were only better off inasmuch as the terms of their settlement with the Chinese forbade them to bring their wives, whether mad or sane, to live with them. But they were worse off than their counter-parts elsewhere in being allowed to leave their tiny ghetto only three times a month, being forbidden to go in sedan chairs or go for pleasure trips on the river. However, things improved after the Chinese defeat in the two Opium Wars and the acquisition of Hong Kong.

But in the Malay Archipelago and the waters of Borneo and the Indonesian Islands little changed up to the beginning of the Second World War. The traders quietly got on with their business without the pomp and monolithic government and military machinery which eventually developed in India. Unrivalled British naval power and a handful of small garrisons scattered throughout the area served to remind local rulers that the British were in a position to dictate terms if necessary. This situation was helped to a large extent by the absence of any strong nationalist movement in the area until after the Second World War.

Inevitably, however, a shift in emphasis took place from pure trading to trading and administration; trade could only function properly if the politics of the area were fairly stable and this they frequently were not.

In the Malay States for instance, internecine warfare was rife until British Residents were appointed to 'advise' the Sultans. This was a typical British euphemism since the 'advice' offered had to be acted upon whether the Sultan liked it or not. As it happened most of them did, since the protection which went along with

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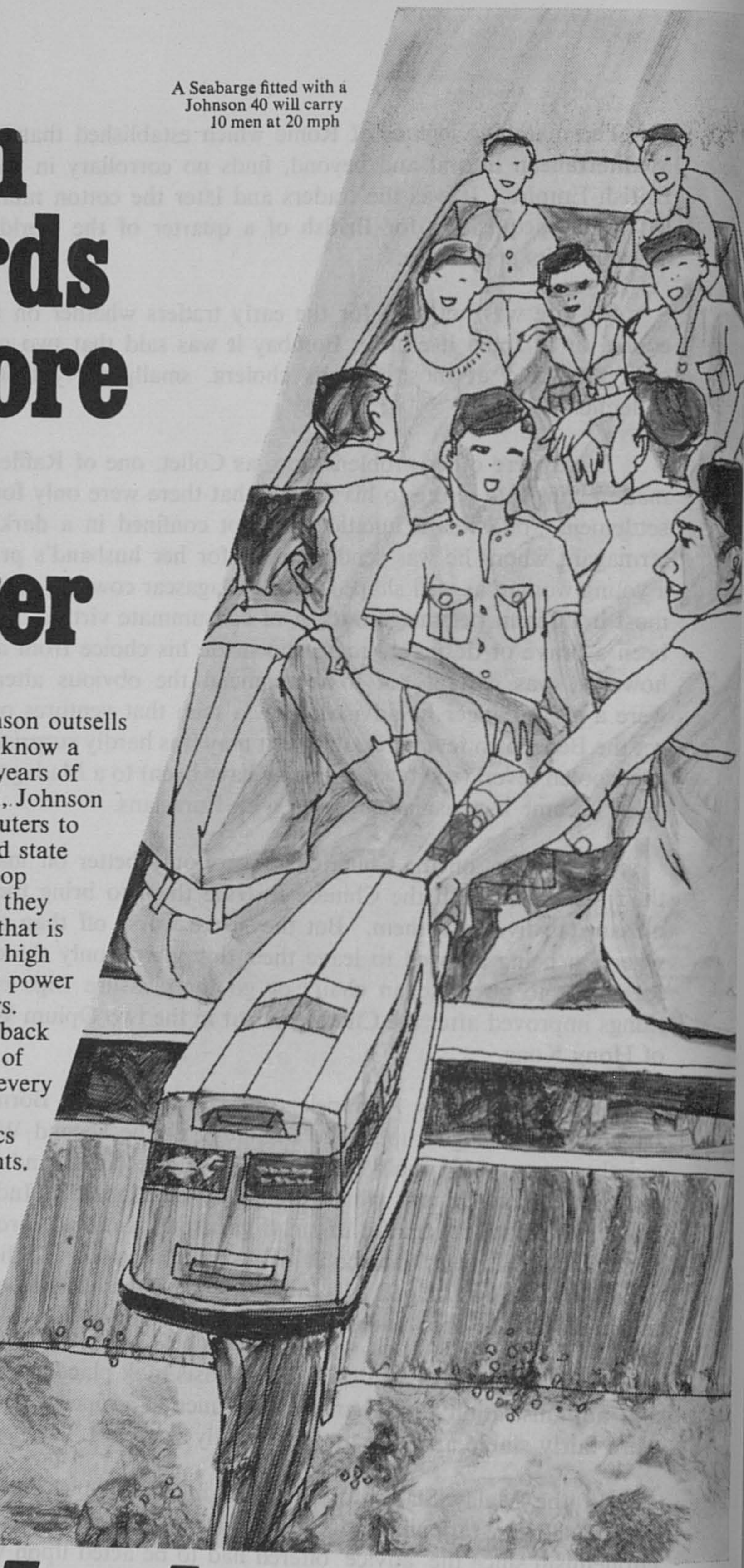
A Seabarge fitted with a Johnson 40 will carry 10 men at 20 mph



In Malaysia and Singapore, Johnson outsells all others 2 to 1. Because people know a Johnson is *dependable*. With 50 years of outboard experience behind them, Johnson engineers know how to use computers to improve the design, innovate solid state electronics in the ignition and Loop Charging in the combustion. But they still know how to build a motor that is simple. That *dependably* delivers high torque in low revs and maximum power from every drop of fuel. For years. From 2 to 125 HP. And then we back it up. We're the Marine Division of The Borneo Company. We stock every spare that could be called for. We have factory-trained mechanics with the right tools and instruments. We make Johnsons *doubly dependable*.

BORNEO

Johnson

the advice allowed them to feel more secure than they had ever been in the past and they received their fair share of taxes without having to fight for it.

A separate administrative service was set up in 1910 to which Malays were recruited and by 1935 there were twenty Malay District Officers. But the political and economic direction of Malaya was in the hands of some seventeen hundred British officers who controlled all the key posts.

As the author points out, by 1920 Malaya was one of the most prosperous and progressive countries in Asia, which says much for the administration.

Although it is fashionable nowadays among politicians to blame all and any ills on the Colonial administration it is well to remember that many of the administrators of that period were dedicated men whose only reward frequently was the satisfaction of a job well done. They were not where they were for profit or even for glory as were the traders and adventurers of an earlier age. But then we might ask ourselves what was the reason that made young men of upper middle-class families exile themselves for a lifetime to some forgotten corner of the world where disease, boredom and frequently danger were endemic.

The author does not answer this question.

To myself, having served in Africa for a time in the Native Affairs Department it appears something almost religious. Between 1837 when Queen Victoria came to the throne and 1901 when she died Imperialism became a religion in itself. The *Pax Britannica* with its Roman ideas of *gravitas, ordo lex* was a creed to Victorian administrators and even to those who saw out the last days of Empire.

And then there were the lyrical poets who with their imperial ethic contributed to this idea of service. 'The white man's burden'; the 'soldier on the passes in obedience to the Widow at Windsor' and the 'lone task of the younger son' administering 'lesser breeds without the Law." A vision born out of English superiority perhaps but also one of a dedication to social justice.

Of the adventurers, James Brooke was the most successful but not the first.

Alexander Hamilton called at Johore in 1703 on his way to China and met the 'King' of Johore. 'He treated me very kindly and made me a present of the island of Singapore' he records. He turned the offer down but it is interesting to wonder how Mr Lee Kuan Yew would have got on with a 'White Raja'.

Alexander Hare was less reluctant when offered a principality in Southern Borneo but 'spent his money building a palace and his energy enjoying the girls of his numerous harem.' His partner John Clunies-Ross was less romantically inclined and when the inevitable crash came moved himself to the Cocos Islands, (where his descendants still perpetuate their feudal rule if the Australian Government is to be believed).

The Brooke dynasty survived because they were less interested in material gain than were other contemporary adventurers.

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But apart from those who carved out kingdoms for themselves, there were those whose names are not recorded in the history books.

The soldiers of fortune who appeared briefly on the scene and then disappeared. Men like Sergeant Pennefather 'converted to Islam and commanding a ragged company of Arab and Indian mercenaries' who, however, proved an even less able fighter than his Malay opponents and died with fifty-two of his men in Selangor.

China was always a great place for mercenaries the most famous of whom was undoubtedly 'Chinese' Gordon who led his men with only a cane in his hand and later died at Khartoum. But Gordon was not typical of the majority of mercenaries and soldiers of fortune. He was, first and foremost an English Christian gentleman and 'after God it was England he served.' His remorseless defeat of the Taipings was not due to any loyalty to his temporary employers but because 'he had been given that duty as a British officer.' But Christian gentlemen or not, they were all great characters. Two-Gun Cohen, One-Arm Sutton and all the others who stalk the pages, larger than life, of any book on pre-World War China.

In dealing with the social world the author inevitably picks on The Club; capitalized to mean anyone of the numerous clubs which were so much a part of Colonial life.

Whilst admitting that the Selangor Club from its inception admitted 'a few carefully chosen Malay Aristocrats' (for which reason he erroneously attributes the popular name 'Spotted Dog') he is careful to make the point that throughout the East the 'Club' was usually the stronghold of European exclusiveness. This was probably true, although there were clubs, not mentioned by the author, such as the Royal Western India Turf Club and the Willingdon which were non-exclusive right from the start. It is also true that there were exclusive Hindu, Mohamedan, Parsi and Chinese clubs to which no one objected and to which an expatriate would not have been admitted.

The real sore point against the British Clubs was that they were the meeting place of the then ruling race and it was galling to think of this small community shutting itself up in seeming superiority.

It was felt that there was something more vital to club life than there actually was and I suspect that when the British Clubs eventually opened their doors to all and sundry there were many who were disappointed that there was nothing more than could have been found in their own institutions. After all, what did the clubs really offer? A game of billiards, a meal, conversation and primarily a well-stocked bar (the author notes that the Shanghai Club spent $16,724 on drinks in 1870 against $72 on its reading room).

That the British communities in the Far East were philistine in taste and uncreative in intellectual thought is largely true, although Malaya was better off than elsewhere since at least many of the civil servants were the possessors of a classical education.

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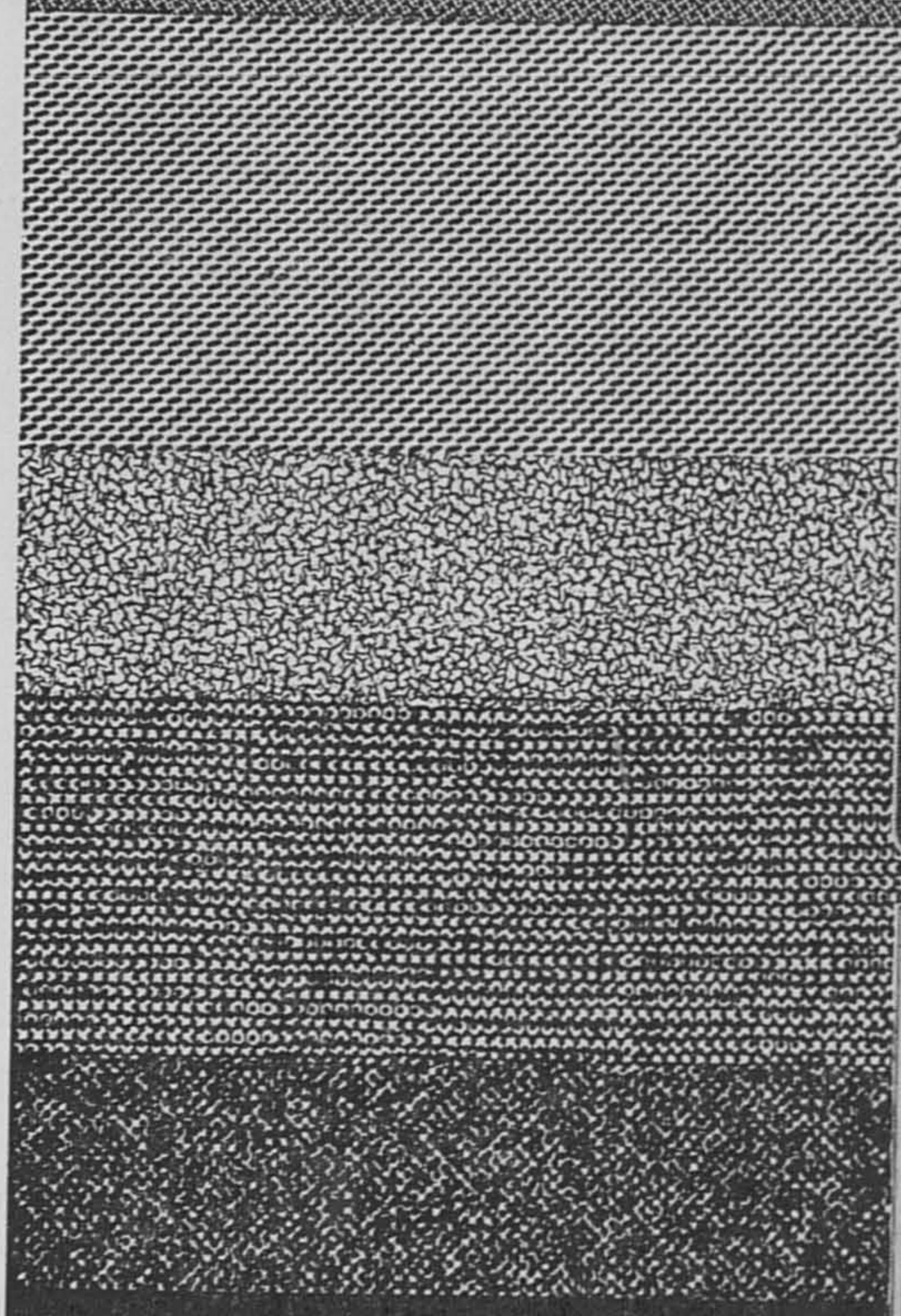

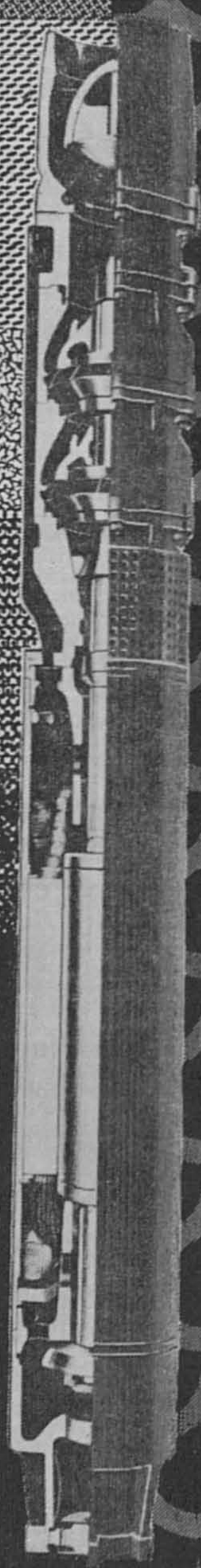

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Crawford, Swettenham and Windstedt all contributed to the history of the area as did Leyden with his translation of the *Sejarah Melayu.* Raffles himself would have achieved much more in this sphere had his great collection of manuscripts collected in Java not been destroyed in the fire that gutted the boat taking him back to England.

At a time when it appears necessary to most authors to debunk empire-builders and minimize the achievements of colonial administration it is refreshing to read the impartial judgement presented in this book.

The warts are not powdered over but neither is the complexion blackened, and what emerges is a fair and fascinating study of over 300 years of British connection with this part of the world.

P. H. DALE RUDWICK.

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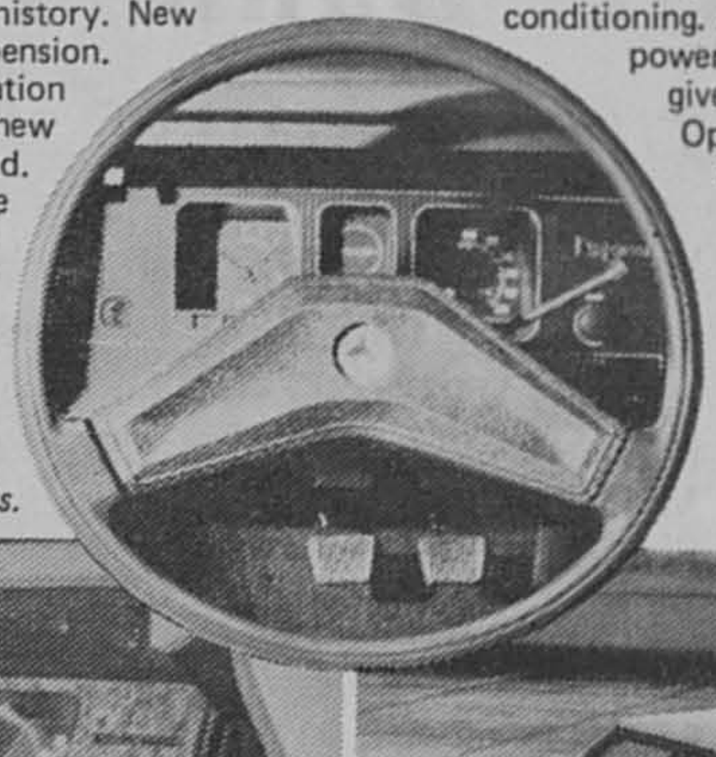
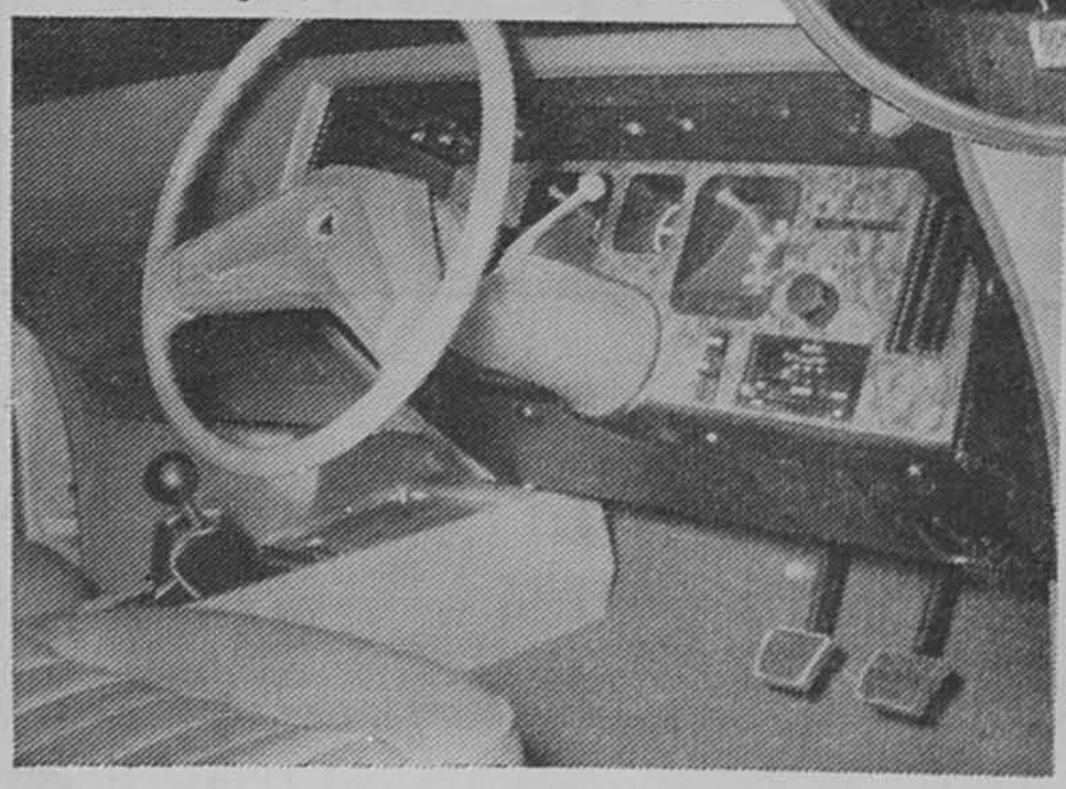
The new Holdens have already changed Australia's ideas about how a good car should look. Drive one . . . and you'll change your ideas about how a great car should ride. A five foot wide track and new big coil springs over each wheel see to that . . . but these are only two changes in the most changed Holdens in history. New styling. New front chassis design. New suspension. New seating comfort. New flow-thru ventilation system. New steering. New brakes. Exciting, new Kingswood, built with your family in mind. Luxurious new Monaro LS model for prestige two-door motoring. Australia's first long-wheelbase wagons. You've got to drive new Holden to believe it . . . and we've got them ready waiting for you to do just that. Do it today. The superb Premier range offers luxurious fold-flat bucket seats with folding arm rests front and rear, and superb fully instrumented walnut facia, with built-in, forced-flow ventilation and concealed air conditioning. A smooth six-cylinder engine provides ample power in silky silence, while power disc brakes give fade-free, safe stopping from high speeds. Optional power steering completes your comfort and safety. And finally a choice of a 3-speed column gearchange, full automatic transmission, or the sporty, 4-speed console shift, with new manual gear-box that allows optimum gear ratios, maximum reliability.



The superb new Premier with 4-speed floor console gear, bucket seats and headrests.



The new Holden Premier looks what it is — luxurious motoring.

All it wanted was an anti~biotic

Fungi attacked its tapping panel. Little was done to stop the dreaded Blackstripe and Mouldy Rot diseases. Now it's drying up. Latex flow is slow. Yield is low. Things would have been better if an anti-biotic was used.

We recommend ACTI-DIONE 4.2%. It's an anti-biotic fungicide that efficiently controls panel diseases, at economical costs. It is absorbed into the plant tissues and destroys fungi cells. One tree needs about 15 c.c. of diluted ACTI-DIONE 4.2% sprayed or painted around the tapping area.

But get more details from your nearest Shell office. And remember: if it's a chemical — or you think there may be a chemical that might help you — call Shell Chemicals.

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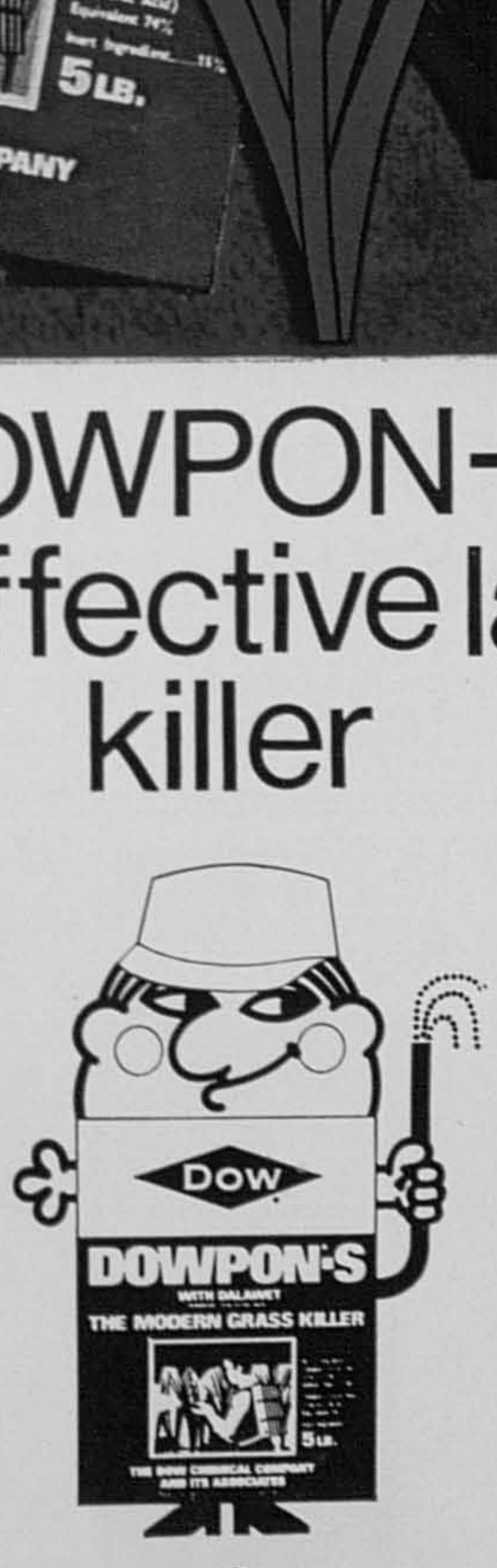
DOWPON-S is the quick complete 14 days cure for lalang headaches. DOWPON-S, containing Dow's exclusive Dalawet penetrating agent, attacks the lalang roots, killing it completely. Easily applied by spraying or wiping after mixing with water, swift and economical



DOWPON-S, is only one of Dow's solutions to your agricultural problems. Dow specialises in agricultural science and every product is the result of years of research. So when you're faced with a weed problem, consult the Dr. from Dow. He has the solution.

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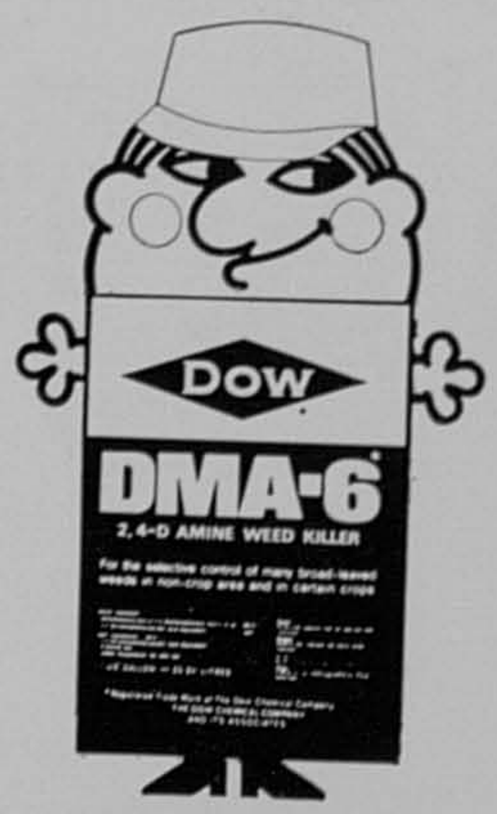
How to kill off all weed problems with one solution DMA-6

DMA-6 from Dow. No matter what your problem is, broad leaf weeds, hairy or woody stemmed weeds, a mixture of weeds of all shapes and sizes, even tough and hardy grasses, DMA-6 kills them all, completely. For selective weed control, just mix DMA-6 with water. It will kill off broad-leaf, hairy and woody stemmed weeds. A dose of DMA-6 with Sodium Chlorate, Lissapol and water gives you total weed control over a mixed company of weeds, while



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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Report from Uplands School

The Christmas Term is drawing to a close. Only three weeks more as I write these words.

I have been at Uplands since May and as yet have not made a contribution to *The Planter*. Feelings of guilt to add to the usual end-of-term rush. So here I sit, determined not to get up until I have put down my impressions of the school.

First, it seems to me that our standards are nothing to be ashamed of; in fact in many ways we ought to be proud of them. For instance, a standardised Reading Test administered to every pupil in the Upper School revealed that 74% are above average. With no class exceeding 16 children there is reason to believe though, that we can do even better.

Maths and Science are receiving considerable attention too, because two new teachers were in fact specialists in these subjects before joining the Staff, and standards are rising. Next term we are to be visited by a group of Maths and Science teachers taking a course at RECSAM (the Regional Centre for Science and Maths which is based at the Universiti Sains). They come from 8 countries in this region, and together with their British and American instructors will be here to see how a British school tackles these subjects. We regard it as an honour to have been invited to participate in their training scheme.

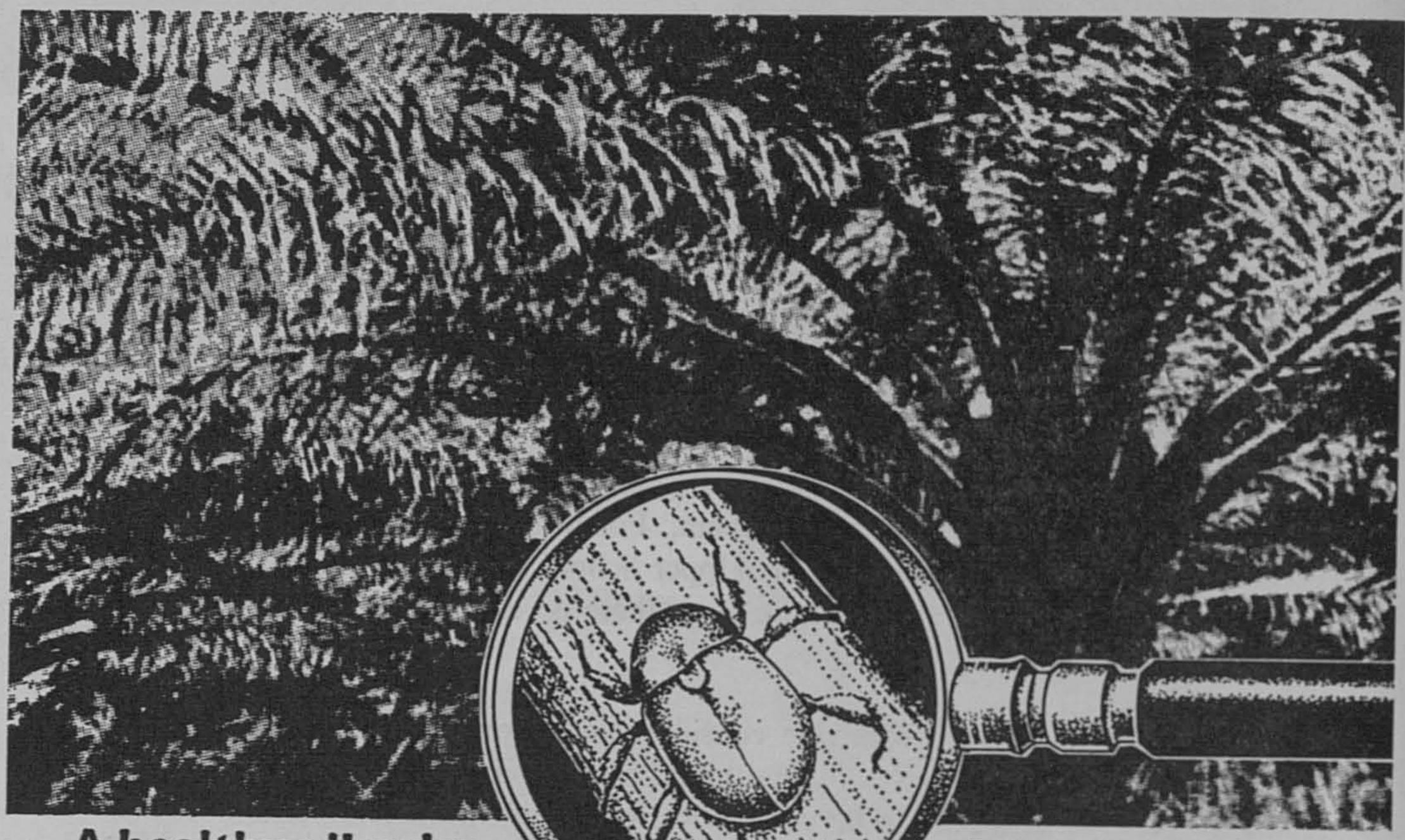
The "frill" subjects are not being neglected either. Uplands' Art and Craft room is most impressive. It is the best room of its type that I have come across anywhere.

All in all I can safely say that the School compares favourably with any other in which I have served, and this is due largely to the Staff, who are doing all they can to bring new ideas to bear on old subjects. We do not intend to stagnate, isolated as we are.

In conclusion I must say a word about our intake. Numbers were down on last term but there are signs that things are picking up again. It looks as though we shall have more children next term than we have at present. This is because we have cast our net wider and now have several pupils from as far away as Laos and Cambodia.

Let us do all we can to keep Uplands on the map because it is serving an excellent purpose and, in my opinion at least, the fees are very reasonable.

P. E. DRURY,
Principal.



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Kills crop pests to help crops grow.

Estate Practice examination (Cocoa)

PART I

22 September 1972 *Time: 3 hours*

(The mark value of each question is given in brackets and the examiner's comments in italics)

Q1. (a) Cocoas are classified into three botanical groups. Name these groups and describe their possible inter-relationship and general characteristics of cocoas in each group. (5)

Well answered by two candidates, one of whom provided too lengthy an answer in relation to marks allocated.

(b) Write notes on factors which influence the choice of cocoa planting materials. With special reference to circumstances (which should be defined) on your estate, name the materials you would select for planting and indicate expected yield progressions in the initial five years of bearing. (10)

Not well answered. Insufficient details was provided of materials selected for planting. One candidate considered Amelonado seedlings higher yielding than Upper Amazon hybrids.

Q2. Describe the germination method and various nursery practices you would adopt up to the time when hybrid seedlings are to be planted in the field. Provide justification for the period you intend retaining seedlings in the nursery. (15)

Candidate 087 failed badly as he did not describe nursery practices—valued at 6 points. Although all three candidates obviously come from the same organisation, one advocated planting ungerminated seeds directly into bags whereas the others correctly recommended germinating seeds prior to planting, which results in more uniform nursery development. All agreed it desirable to retain seedlings in the nursery for five months, but none quoted better establishment success in adverse circumstances (e.g. *if drought after planting*) *and the advantage in time to maturity when compared with material retained in the nursery for a longer period. All stated that shade would be well enough established if seedlings are held in the nursery for five months, but that point is irrelevant as timing of shade planting is largely independent of age of cocoa seedlings to be planted.*

Q3. Write notes on the following in relation to cocoa nutrition: — (20)

(a) Soil pH

All candidates recommended application of ground magnesium *limestone to raise soil pH. No reference was made to choice of fertilisers in relation to soil acidity* e.g. *preference for calcium ammonium nitrate or urea as sources of nitrogen for highly acidic soils.*

(b) Means of determining fertiliser requirements

The value of field trials and visual symptoms in diagnosing fertiliser requirements were not mentioned. All referred to foliar analysis as a diagnostic technique, but none mentioned its limitations.

(c) Relationship between shade intensity and nutrient requirements

(d) Timing and placement of fertilisers

Insufficient emphasis was placed on timing of fertiliser applications in relation to cropping pattern.

Q4. Provide, with reasons for your choice, full particulars of the shade regime you would select for monocrop cocoa. Illustrate, by means of a diagram, the planting pattern/spacings you would adopt for both cocoa and shades. Describe briefly how the various shades would be planted and maintained. (20)

Quite well answered, but no candidate considered use of economic shades such as coconuts.

Q5. List the major pests encountered on cocoa estates in West Malaysia and describe the nature and significance of damage they incur. What control measures should be adopted against these pests? (10)

One candidate included Sahlbergella singularis *(a serious capsid pest in W. Africa, but not found in W. Malaysia) among the major pests in this country. Recommended control measures against the various pests were not recorded with sufficient precision.*

Q6. Write notes on four of the following: — (20)

(a) Integrated pest control in cocoa

The principles of integrated pest control on cocoa estates were not clearly reported.

(b) Cherelle wilt

(c) Precautions in herbicide usage for weed control under cocoa

No candidate advised against use of hormone herbicides in young cocoa plantings.

(d) Three major stem diseases of cocoa, pathogens involved and their control

(e) Formation pruning of cocoa

(f) Harvesting standards

No mention was made of the importance of sharp harvesting tools and two candidates made no reference to avoidance of damage to flower cushions.

PART II

Time: 3 hours

Q1. Provide an outline of the technology of cocoa fermentation and indicate to what extent events can be influenced by management practices. (15)

Badly answered. Only one candidate described with reasonable accuracy the technology of cocoa fermentation. None mentioned the influences of bean depth, frequency of turning beans and duration of fermentation as management practices which affect fermentation progress.

Q2. You have been requested to advise on processing requirements and methods to be adopted on an estate which plans to plant 200 acres, 500 acres, 1 000 acres and 1 300 acres in succeeding years. Yield progressions of individual plantings are expected to be: —

3rd	year from planting	—	250 lb dry beans per acre
4th	,, ,, ,,	—	600 ,, ,, ,, ,,
5th	,, ,, ,,	—	800 ,, ,, ,, ,,
6th	,, ,, ,,	—	950 ,, ,, ,, ,,
7th	,, ,, ,,	—	1 050 ,, ,, ,, ,,
8th	,, ,, ,,	—	1 100 ,, ,, ,, ,,

(a) Indicate phasing and capacities of fermentation and drying facilities. Calculations should be shown. (10)

Badly answered. No candidate calculated correctly the annual crops to be processed. Even allowing for errors in calculated annual crops, fermentation and drying requirements were incorrectly calculated.

The estimate that the peak monthly crop will amount to 12.5% of annual production is low. 20% is considered more realistic. In calculating fermentation requirements, candidates failed to make allowance for the fact that beans are held in boxes for 6–7 days.

(b) Illustrate layout of entire factory. (5)

(c) Briefly outline choice of equipment and recommended fermentation and drying practices. (10)

All candidates recommended the equipment and processing methods at present used on their estate. These would not necessarily be best suited for an estate producing almost 3 000 000 lb dry beans annually.

It was apparent that none of the candidates was conversant with a comprehensive paper on the subject of processing cocoa beans which was presented at the 1971 ISP Cocoa & Coconuts Conference.

Q3. Write short notes on the following: —

(a) Bean moulds and factors predisposing stored beans to infection. (5)

(b) Manufacturers' requirements in respect of bean weight, 'shell' content, moisture content, standard of fermentation and bean flavour. (5)

(c) Storage of cocoa beans. (5)

(d) The Code of Practice cut test. (5)

Generally well answered, except for particulars of the Code of Practice cut test which are recorded on page 7 of Wood's paper "Manufacturers' Quality Requirements" *presented at the same conference.*

Q4. Prepare an estimate, item by item, for 12 months upkeep, manuring and harvesting of a cocoa planting in the first year of bearing, assuming monoculture and yield per acre averaging 250 lb dry beans. Labour requirements and various costs should be expressed on a per acre basis. (10)

Badly answered by one candidate who listed only labour requirements but failed to indicate material costs. The other candidates fared better, but estimates were either insufficiently detailed or were not presented as requested.

Q5. In relation to the current MAPA/NUPW Agreement, answer the following questions: —

(a) What is the agreement on work on the weekly day of rest? (5)

Surprisingly incomplete answers in view of the fact that the situation is described in detail in MAPA Circular No. 30/72 dated 29th August, 1972.

(b) What is the annual vacation leave entitlement of labourers and basis of payment?

Which public holidays are included in the leave entitlement? (5)

Q6. Write short notes on the following: —

(a) Prophylactic measures against malaria on a cocoa estate. (5)

(b) Choice of structural and flooring materials in cocoa factories to resist corrosion. (5)

(c) Choice of spraying equipment and nozzles for weed and pest control on cocoa estates. (5)

(d) Disposal of rubbish from line sites. (5)

Although all candidates passed, some of the answers indicated lack of experience in certain aspects of estate practice.

Lesson in Import

They were needed, all of the 32 000 cocoa seeds from Sabah and the order was duly placed and confirmed. Two lots of 16 000 with a week in between.

You never know with these things, and documentation was begun some 3 months before the seeds were due to arrive. The ball began to roll with a letter to the Department of Agriculture for the necessary permit to import plant material. That is form *Pertanian 95—Pindaan 11/68.* One permit for each consignment arrives and all seems well except that the form says that a copy must be sent to the consignor and another one to the Imports & Exports Control Officer in Kuala Lumpur. Difficult if you only get the one copy but here the photostat copying machine comes in handy. Copies are sent off as instructed and back comes a letter from the Import & Export Officer to tell us that we must send him form *JK 69* as well (in triplicate) and photostat copies are not acceptable. So this is then explained to the Department of Agriculture who oblige with more copies of their permit and with form *JK 69* (in triplicate) they go to the Import & Export Officer. Our *JK 69* is for 2 × 16 000 seeds and back it comes duly endorsed and approved.

Documentation seems complete and eventually the telegram arrives advising us of the despatch of the seeds and their scheduled arrival at Kuala Lumpur Airport, flight number and all; well done Sabah. The plane is due to arrive at 15.15 and the Cargo Office of MSA is phoned to ask assistance for the clearance of the seeds that same evening. A very efficient young man says not to worry and he will warn Customs and the Agricultural Officer at the airport.

The assistant manager travels his 150 miles to the airport in good time and produces the documents. But first a yellow form *Kastam No. 1* has to be completed; this is *Declaration of dutiable Goods Imported* and on the form must be written that "exemption is claimed from duty under Para 2 (1) (a) of the Customs Duties (Exemptions) (Goods of Malaysia origin) Order 1968 subject to the conditions therein specified." All is then ready for the collection of the seeds but that takes until 20.00 hrs because the No. 1 officer has gone away for his evening prayers..... And then someone casually remarks that the second consignment cannot be cleared on these papers because its number has been omitted on our copy of *JK 69.*

The next morning, while the seeds are lying in their little plastic bags the documentation exercise is re-started. The omission is pointed out to the Imports & Exports Control Office. Fresh *JK 69* (in triplicate) is enclosed with the letter and so is a copy of the permit from the Department of Agriculture and will they please send the permit by return post as the seeds are due in 6 days from now?

Six days later there is no permit and on his way to the airport the assistant manager first visits the Office of Imports & Exports Control.

Alas, since the Senior Officer has gone out nothing can be done..... The assistant manager is of the persuasive type and eventually the chief clerk agrees to put the number on paper, but he can't sign as that must always be done by the *Ketua*. Who has gone out. And then the chief clerk adds that our permits should actually come from their Butterworth office anyhow.....

At the airport, two hours after the arrival of flight No. 453 from Sabah, the parcel is cleared. Next morning planting begins, or should begin, but it pours with rain.

One thing is abundantly clear and that is that after 25 years in the game you continue to learn all the time.

PRISMA.

P. S. The permit finally arrives, four days after the seeds.....

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WHEN TO APPLY:

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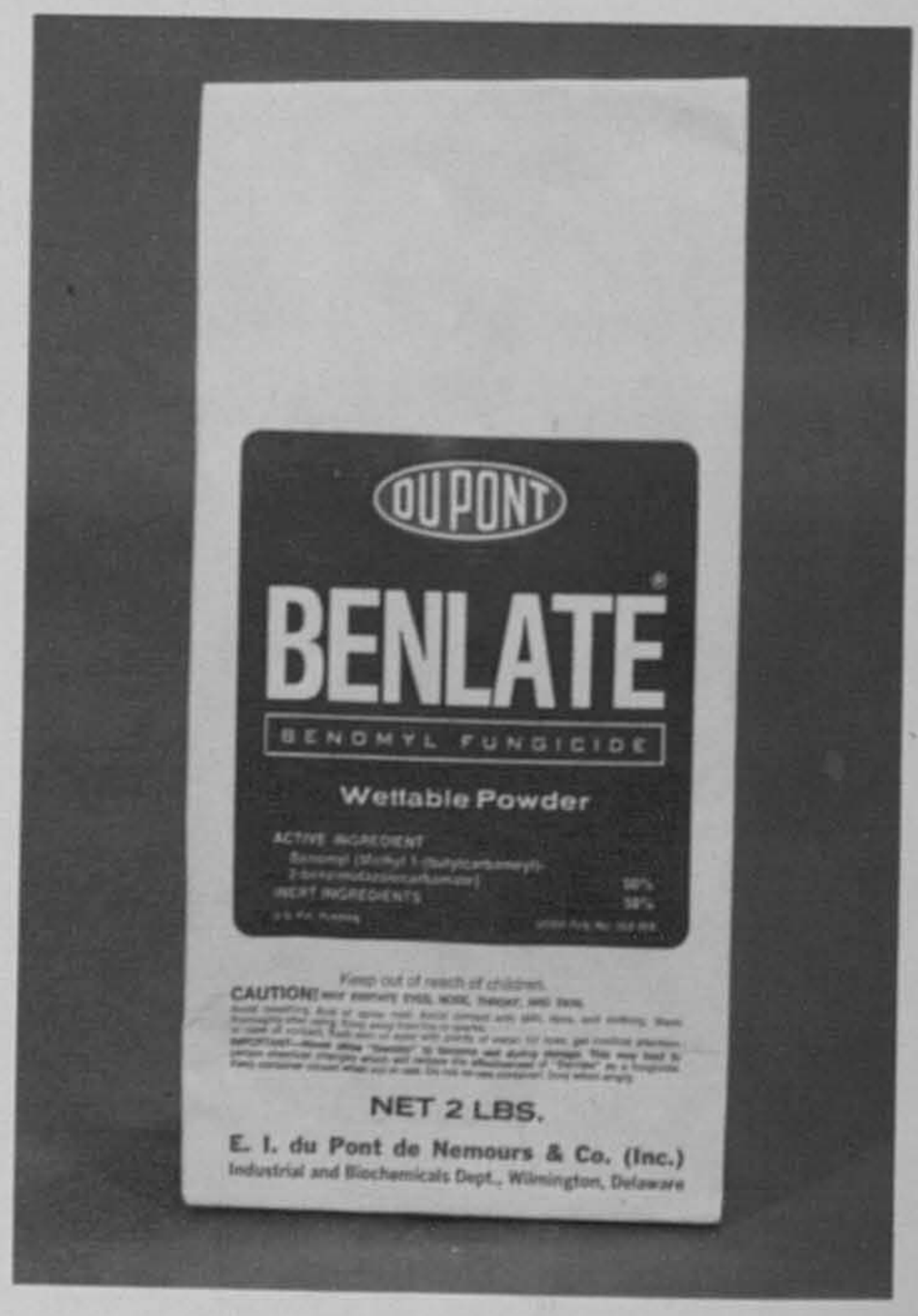
HOW TO APPLY:

Apply Benlate® at 8 oz. per 80 Imperial gallons of water (6 grams in 2 gallons) either as a spray with a flat fan nozzle or with a brush at 4" above and 2" below the tapping panel.

WHEN TO APPLY:

Begin application when disease first appears on the tapping panel and repeat treatment at 7 day intervals as long as needed. Spot treatment may be necessary in case of re-infection.



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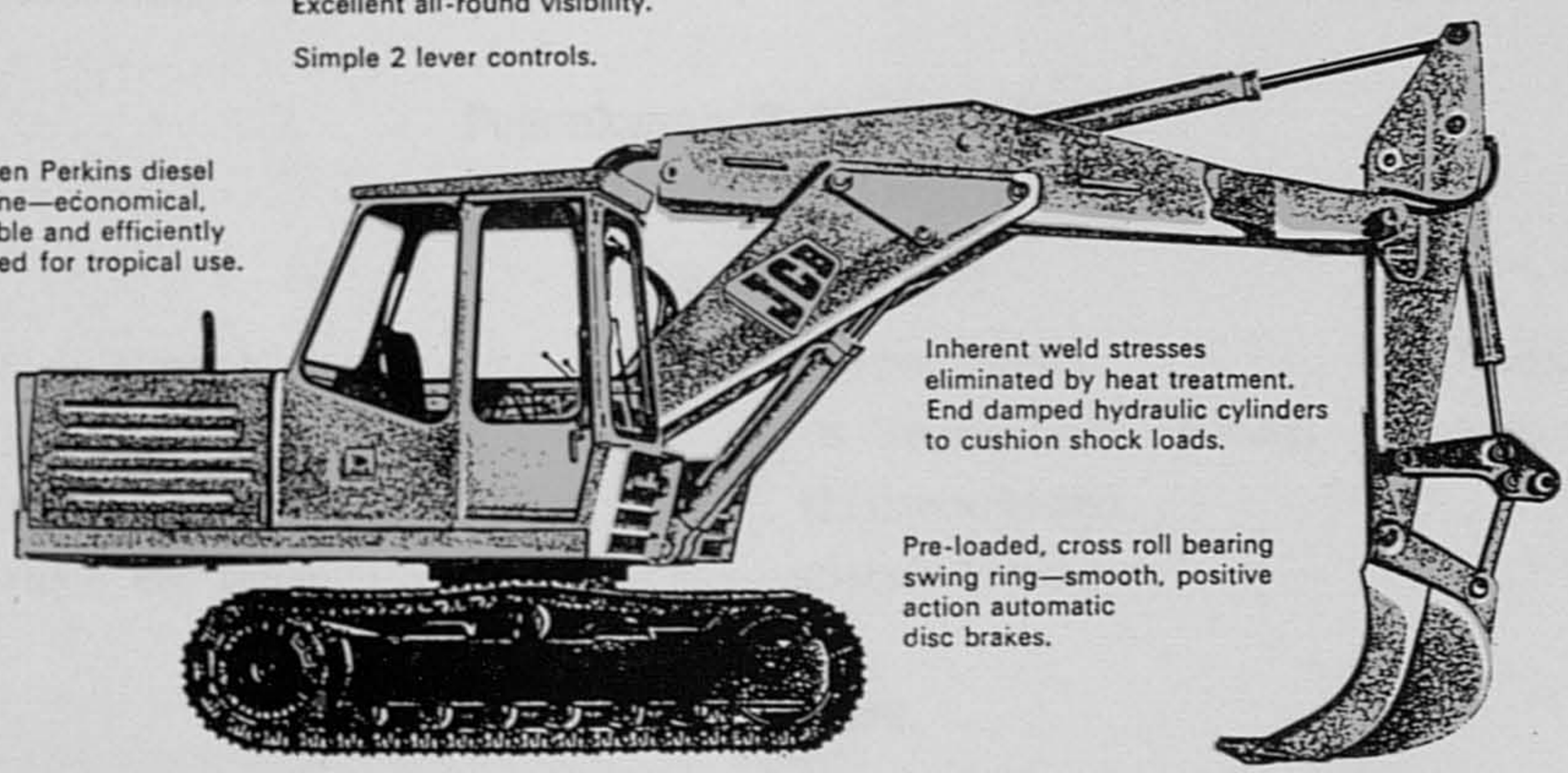

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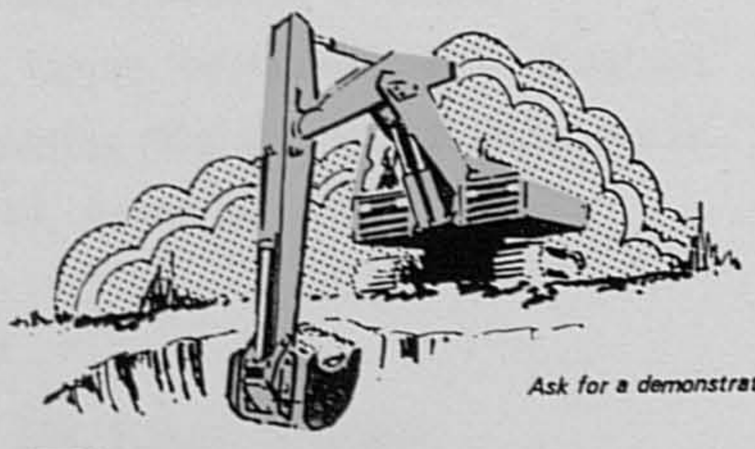

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Pang Yen Yong	,, ,,	Passed
Tan Boon Joo	(North Johore)	,,
Tham Seng	,, ,,	,,
Low Heng Jin	(Malacca/Muar)	,,
Hooi Chiew Choong	,, ,,	,,

Peperiksaan Bahasa Malaysia (Peringkat Tinggi)

24hb Oktober 1972

Siow Heng Kin	(Lower Perak)	Passed
Low Ah Kaw	(S. Trengganu/E. Pahang)	,,
A. Arikiah	(Malacca/Muar)	,,
Hijoo bin Isman	(Sabah–Tawau)	,,

On leave

3818 Cowie, L G, 74 Hillcrest Gardens, Hinchley Wood, Esher, Surrey, England.

4777 Herbert, A P, 64 Castleton Road, Eastcote, Ruislip, Middx, England.

4059 Hilston, W B, c/o Grace, 17 Girraween Grove, Ashgrove, Brisbane, Queensland, Australia.

5246 Lee Khik Tiong, 37 New Road, Kg. Kah, Sitiawan, Perak.

5780 Mayakrishnan, P, 10 Rajaachar Street, Thiyagaraya nagar, Madras, S. India.

4997 Montgomerie, J, NDA, MRAC, AISP, c/o Beech House, Upper Swainswick, Bath, England.

5491 Than, J L, 49, Lorong 4, Jalan Azizal Rahman, Kamunting (Kg. Pinang), Taiping, Perak.

4846 Wakefield, O F, 18 Stirk Road, Alfred Cove, Perth, W. Australia.

Returned from leave

5423 Anderson, M A, Highlands Palm Oil Mill, P O Box 138, Klang, Selangor.

4216 Chapple, B W, Ulu Tiram Estate, P O Box 710, Johore Bahru.

4373 Leow Sun Kong, Tanjong Pau Estate, Jitra, Kedah.

3491 Macpherson, D A, AISP, Segamat Estate, Segamat, Johore.

2042 Morton, R J, JP, FISP, 1142 B Syed Abu Bakar Road, Teluk Anson, Perak.

4655 Turnbull, G H, AISP, Sabrang Estate, Teluk Anson, Perak.

4377 Wills, G A, AISP, Kuala Jelei Estate, Bahau, Negri Sembilan.

Change of address

5140 Arulandi, K, BSc, AISP, Pilmoor Estate, Batu Tiga, Selangor.

4715 Benton, D M, Sedgeley Estate, Kajang, Selangor.

5801 Chee Kheng Hoy (Dr), Rubber Research Unit, c/o University of the West Indies, St Augustine, Trinidad W I, W. Indies.

4936 Chiew Keng Wee, AISP, Lepan Kabu Estate, Kuala Krai, Kelantan.

5015 Clifton-Brown, N, BSc (Agri), AISP, West Estates, Carey Island, Port Klang, Selangor.

5279 Chan Cheok Onn, AISP, Merlimau Estate, Merlimau, Malacca.

4745 Dixon, R B, NDA, AISP, Bukit Benut Estate, Kluang, Johore.

3927 Douglas, N A, 1 Bel Air Drive, Hillsborough, Auckland 6, New Zealand.

5277 Gill, D S, Kirby Estate, Labu, Negri Sembilan.

5763 Hill, D A G, Solomon Islands Plantations Ltd, P O Box 350, Honiara, British Solomon Islands Protectorate.

4717 Irvine, N, Craigielea Estate, Bukit Pasir, Muar, Johore.

5843 Jamaluddin Arshad, Batu 6, Sungai Lias, Sungai Besar, Sabak Bernam, Selangor.

5000 Jagadish, V J, 201-G Siewdor Flats, Lorong Scott, Kuala Lumpur.

5766 Lam Sai Yin, Albert, Sungei Mai Estate, Mentakab, Pahang.

5694 Murugesu, S, Glendale, Estate, Bahau, Negri Sembilan.

5442 Nair, Balakrishnan, Lambir Land Dev Scheme, P O Box 318, Miri 4D, Sarawak.

4465 Petersen, P E, Ulu Bernam Estate, Ulu Bernam, Perak.

3732 Robertson, John, 268 Lorong 7A, Taman United, Kuala Lumpur 21-10, Petaling P O.

5352 Rajasingam, C, Chersonese Estate, Kuala Kurau, Perak.

5450 Sambasivamurthy, S, Tuan Mee Estate Group, Sungei Buloh, Selangor.

5262 Tan Hooi Bing (Datuk), DPMT, 25 Ewe Boon Road, Singapore 10.

4552 Tan, Henry, Nadefinco Ltd, P O Box 10, Kemaman, Trengganu.

4985 Yahaya bin Zakaria, Bukit Kledek Estate, Jasin, Malacca.

4832 Young, S N, 132 Jalan Hilir, *off* Watson Road, Port Kelang, Selangor.

Birth

ROOSEVELT: On 31 October 1972, at Duchess of Kent Hospital, Sandakan, to Liz and Roosevelt Pereira, a son (Joseph Robert).

Death

FOWLER: George Derrick, AISP, Yong Peng Estate, Johore, on 30 October 1972 as the result of a motor accident.

Kayserie

Ingredients

1 oz raisins
1 oz chopped almonds
1 rounded teaspoon ground cinnamon
a few cardamons
3 oz ghee
6 oz semolina
8 oz sugar
¾ pt water
5–6 whole blanched almonds

Method

Fry lightly the chopped almonds, raisins and spices in the ghee.
Add the semolina and fry till brown.
Stir all the time.
Add the sugar and water.
Mix well, lower the flame, cover and leave to cook.
Stir frequently till the semolina is cooked and all the moisture is absorbed.
Pour into a flat dish and flatten with a wet pallete knife.
Garnish with the whole almonds.
Serve hot or cold.

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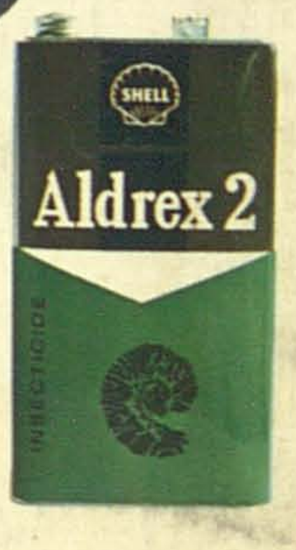

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