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The Planter

KDN 6686

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N O T E

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

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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Editorial:

Enough is enough

The old year has ended with many members expressing deep concern about the future of the Society. Some senior members have spoken of resigning, and a sense of bewilderment and unease has spread through our ranks.

It is vitally important that the source of members' dismay at recent events be identified and seen in its proper perspective, and for this we must go back to the Society's annual general meeting in April 1973.

That meeting coincided with the development of a campaign of calculated vilification of certain members of the Society's executive which, though conducted by a group representing no more than a tiny minority of our membership, has caused needless embarrassment to the Society and an impression that we are falling apart.

At first this group confined its activities to personal attacks on senior office-bearers of the Society, notably its Chairman and Executive Secretary, both by letter—which did not matter greatly—but later in branch minutes, which did, since these are circulated throughout the Society in Malaysia and overseas. No attempt was made by the ISP secretariat to alter or amend these minutes, however misleading or offensive their content. Instead it was assumed that they would so irritate if not anger other members that weight of responsible opinion would soon silence the trouble-makers. However branches were slow to react, although one branch did use—albeit too lightly and too late—the potentially effective weapon of ridicule.

If this were all that has happened, there would be no need for this editorial. A new development however must be viewed by all members with the most serious concern.

A letter addressed to many, but not all Malaysian members by these same disruptive elements purports to be an appeal for the voting into office of two named candidates, both Malaysian and both official nominees for Chairman and Vice-Chairman of the Society for 1974/75. It is worth noting that the other candidates for these offices were not only Malaysians but have a long record of service to the Society. Normally this type of lobbying is unexceptionable; indeed it is to be encouraged in an organisation whose members have not shown overmuch interest in recent years when electing the Society's guiding hand. But the letter we refer to appears to have been distributed too late to have much effect on the ballot, and one has to look further therefore for its true purpose. This is seen as urging the "taking over" of the Society by Malaysians.

The absurdity of this campaign will be obvious to the vast majority of members of the Incorporated Society of Planters. The ISP is now 80% Malaysian and this proportion will inexorably increase. Study of the opposite page shows the degree of participation by Malaysians in the direction of the Society and its various activities.

Moreover the October issue of this magazine carried the announcement that a Malaysian is shortly to assume executive responsibility for the day-to-day running of the Society.

This letter therefore must be seen as an attempt to influence or coerce expatriate members into leaving the Society or, more significantly, into quitting any office in it to which they have been, or may be properly elected.

Most members will be familiar with our history. The Society was founded 54 years ago by a group of British Planters, as a professional body to improve both the Planter and the industry he serves. For more than half a century it has survived and prospered without a trace of political or ethnic bias, and the dwindling number of non-Malaysians among us have done and are doing their best to ensure that the heritage passed down by the Society's founders shall be fully safeguarded and shared by a growing number of responsible Malaysians, a process which, until now, has been continuing harmoniously.

We know of many members, especially Malaysians, who are appalled at recent events. But now is no time to talk of resigning; it is the time to close ranks; to recognise and brand these sordid manoeuvres for what they are, and to get on with the entirely worthy task of furthering the aims and objects of our Society.

Enough is enough.

PUBLICATION ANNOUNCEMENT

The Incorporated Society of Planters announces the publication, in January — February 1974, of

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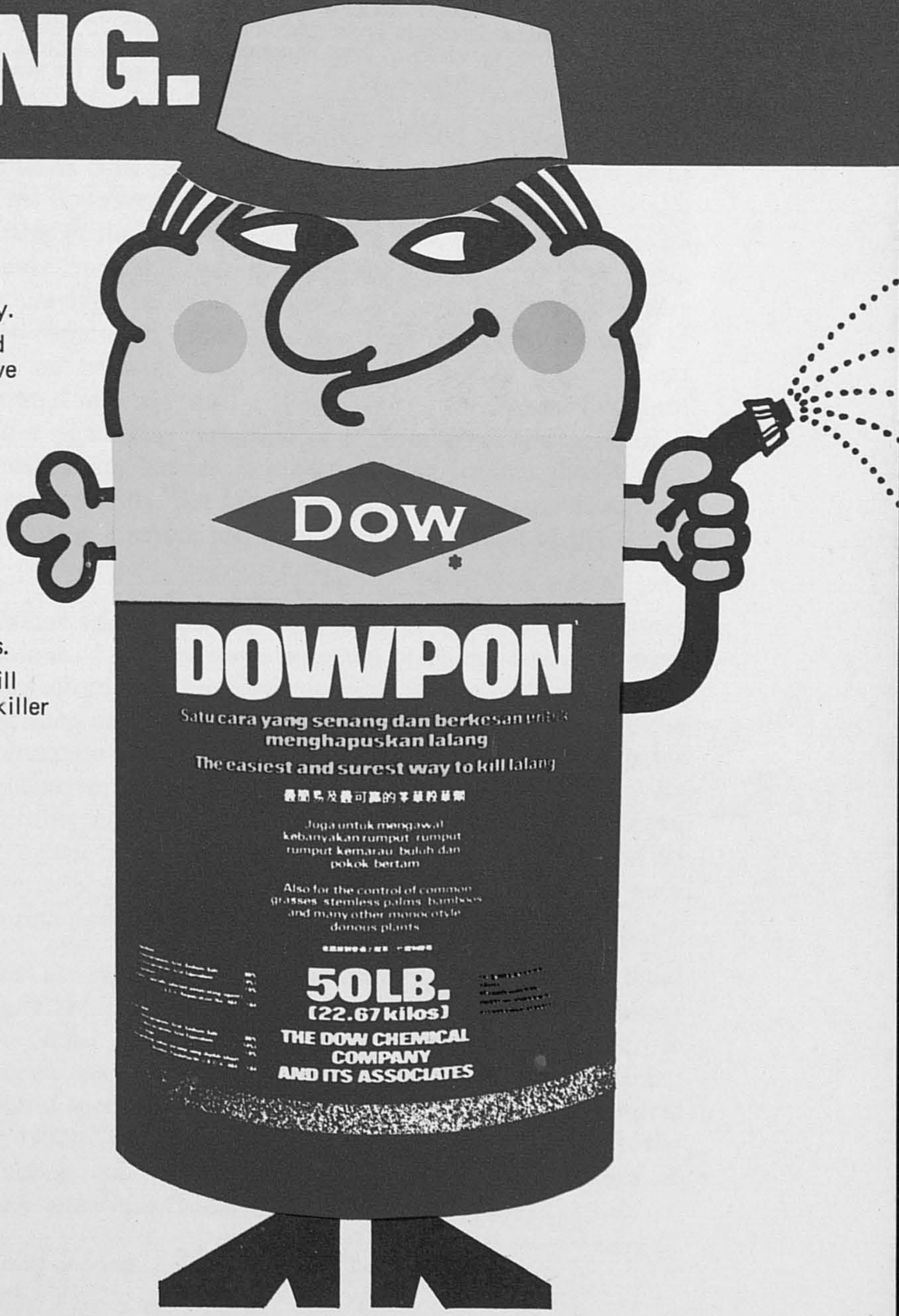

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Planter, Kuala Lumpur **49**: 488–490 (1973)

An effective trap for *Oryctes* beetle in oil palm?

P.D. TURNER*

SUMMARY

Use of a vegetation barrier over potential breeding sites is recognised as an excellent method of *Oryctes* beetle control. In situations where this is not possible or is inadequate, trapping may prove to be of value in future. A powerful attractant, ethyl chrysanthemumate, has been found to be every effective against the pest in coconuts and is likely to prove useful for controlling infestations in young oil palm plantings.

There can be little doubt that the most effective method of *Oryctes* beetle control in young oil palm fields is to remove potential breeding sites at the time of clearing the old stand. This however, is an expensive method and it is frequently preferred to leave the remains of the old stand in the interrow, provided there is no risk of later disease problems. In such situations, very good control of the pest can be obtained through encouraging the rapid coverage of potential breeding sites within the field by interrow vegetation. Such sites are usually stumps or trunks of a former stand of rubber, oil palm or coconut. The efficiency of this excellent method was first demonstrated in Malaysia by Wood (1968a, 1972) and has since been shown to bring about a population reduction of 85% in West Africa (Mariau & Calvez, 1973). If the vegetation barrier is a fast-growing legume then this is obviously very desirable agronomically, but fast coverage by any acceptable natural cover is also preferable to risking a severe and debilitating infestation of the young stand.

There are some situations where positive rhinoceros beetle control measures are required. The most obvious of these is where potential breeding sites are present but where the indirect control afforded by interrow cover has not yet been established. Another is where breeding sites within the field are well protected but where the area is near sources of infestation over which control is not possible. The latter situation occurs quite frequently in oil palm replantings on the west coast of West Malaysia, where infested nearby coconuts often form a major source of the pest. Routine control measures become necessary in such circumstances since there is no doubt that although rhinoceros beetle attack is not usually lethal, the damage very frequently causes a severe retardation of early development and thus yield.

Where control measures are required, these have usually centred around hand collection of adults from affected palms and larvae from breeding sites, a system which entails control after some damage has already been caused (Turner & Gillbanks, 1974). Some success has been obtained using a spray or paste containing Agrocide applied to the central spear region or palm base as prophylactic measures (Anderson, 1972; Sergeant, 1972). The main drawback of chemical treatment is the rapid rate of spear production and elongation, resulting in the appearance of unprotected areas quite soon after insecticide has been applied.

* Harrisons Fleming Advisory Services, 1–4 Gt Tower St, London EC3R 5AB.

The possibility of trapping adult beetles is not a new idea but it is a method which has not been successful in the past. Since a relatively small proportion of a rhinoceros beetle population is caught in light traps (Wood, 1968b), traps have been based on the principle of either providing a suitably soft material impregnated with insecticide into which the beetles can burrow, or using a chemical attractant to entice the beetles into a trap of some description. The *Oryctes* problem is common to both oil palm and coconut cultivation, and it is from the latter crop that research has resulted in an effective but simple trap which, in all likelihood, will prove equally useful in oil palm (Young, 1972).

The attractant found to be very effective is ethyl chrysanthemumate, the ethyl ester of pyrethronic acid. It is a colourless or very pale straw-coloured oily liquid which is only very slightly soluble in water but is soluble in alcohol and oils. The attractant was derived from the very intensive study which took place after World War II of the active ingredients of pyrethrum. Its properties sound quite irresistible since it has been described as 'powerful, winey-herbaceous, sweet and ethereal, very pleasant odour of intriguing complexity, and with a powerful lifting minty undertone. The spicy-herbaceous, warm and almost green-floral notes resemble certain notes in the Jasmine complex' (Rowsell, 1973).

Traps are very simple to make and use. A section of old coconut log about 15 cm long has about four holes bored through it, each 2.5 cm in diameter. The log should not be too fresh and hard since the beetles have to pass through the holes. The section is placed, cut surface downwards, on top of a collection receptacle, into which the lured beetles fall. To be more effective, the trap is placed on a small wooden platform and raised about 1.5–2 m. above the ground on a strong stake, preferably coated with preservative. Experience to-date in Sumatra has been that inserting the stake about 30 cm into the ground is sufficient to maintain stability even in quite strong winds.

The effectiveness of trapping has been found to depend upon the numbers of traps used. Obviously, quick control of an infestation will lead to considerably less palm damage. Therefore, since the traps are so inexpensive to make and maintain, their use at a rate of 25/ha has been recommended (Young, 1972). Where a young field borders a known source of infestation, the density of traps should be higher than further inside the field. Only a few drops (about 0.2 ml) of the attractant are placed around the holes on the underside of the log section, and this is renewed at three-day intervals until the infestation has been controlled. Trapped beetles are collected at the same time as fresh attractant is being applied. At 0.2 ml/trap at three-day intervals for 25 traps/ha, this works out at 50 ml attractant per month.

Whilst experimentation is of course, still required, it seems very likely that ethyl chrysanthemumate will prove very useful in oil palm plantings in south-east Asia; trials are already planned. There is an unconfirmed report of success using this attractant in West Africa. Given a proven efficacy, until supplies are available locally it would seem advisable for an estate group with an oil palm replanting programme, to maintain a central stock of the attractant, *e.g.* enough to treat 100 ha for a month.

Acknowledgement. The writer is indebted to Mr M R Rowsell, of Dubuis & Rowsell Ltd, Elmwood Road, Croydon, England, for technical details of ethyl chrysanthemumate.

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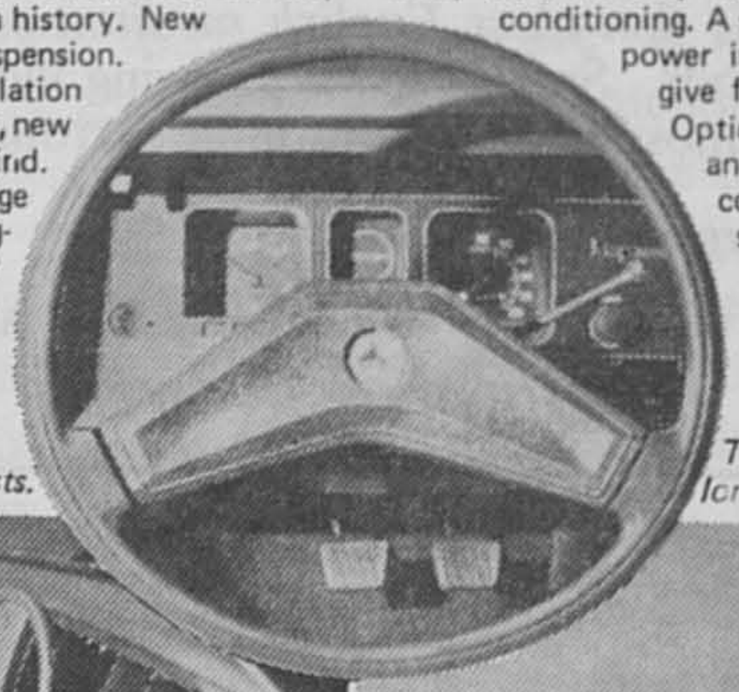

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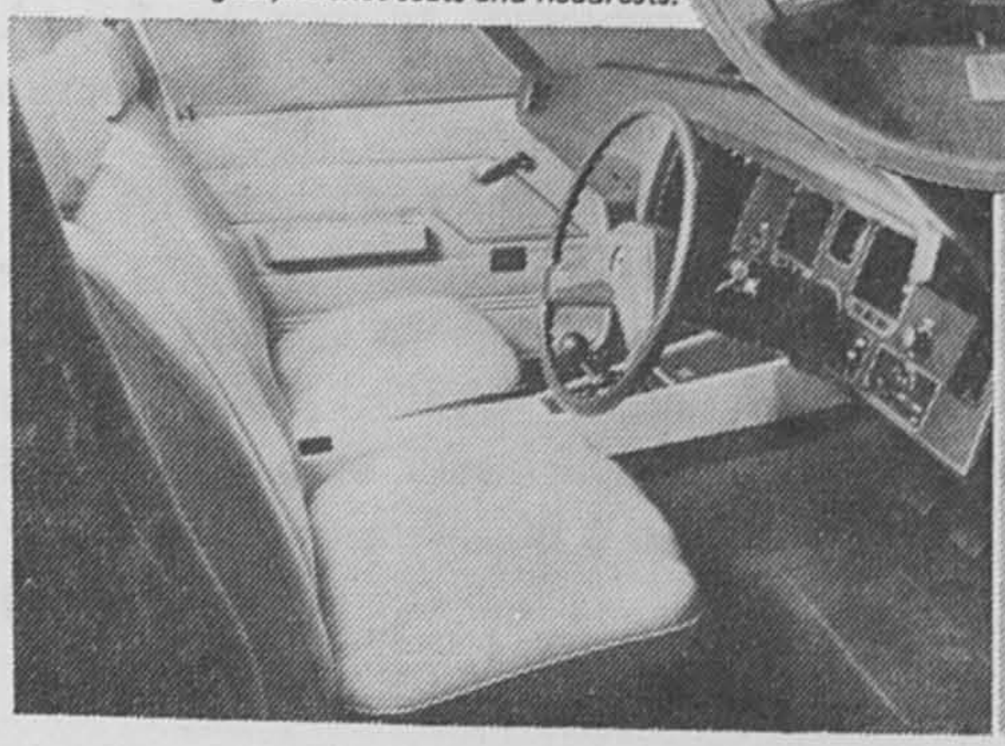

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Planter, Kuala Lumpur **49**: 491–496 (1973)

Plant tissue culture and its potential contributions to Malaysian agriculture

CHRIS K. H. TEO*

INTRODUCTION

Plant tissue culture is an aseptic, vegetative method of plant propagation in which single isolated cell, tissues, or organs are grown *in vitro* on suitable growth medium under controlled environment. The physiological basis of plant tissue culture is the concept of cell totipotency; which was formulated by Scheiden and Schwann in 1839 (in White, 1954). This concept holds that all cells within an organism are independent individuals which are capable of reproducing and differentiating into plantlets by themselves. Since each cell is a diploid, no further cell fusion is necessary for plantlet formation as in sexual propagation. Two essential requirements must be met if cells are to exhibit their full totipotency. First, a cell must be freed from organic connections with the neighbouring cells and second, the isolated cell must be nourished by a medium capable of supporting its rapid growth and development (Steward *et al*, 1964).

Haberlandt in 1902, attempted culturing plant cells in nutrient solutions but his effort failed mainly because the wrong plant material was used. It was not till the early 1930s that White (in US), Gauthret and Nobecout (in France), from their independent work, reported their first successes in obtaining callus tissues from carrot and tobacco. Up to this day, these callus tissues are still growing. The works of Braun (1959), Kato and Takeuchi (1963), Steward *et al* (1964) and Vasil and Hildebrandt (1965) brought to full reality the concept of cell totipotency. They showed that a single cell isolated from vegetative plant tissue can be induced to differentiate into a plantlet. For the first time "test-tube" method of plant propagation has bypassed sex.

Advances in the field of tissue culture over the past 40 years have been tremendous: culture techniques were perfected and numerous growth media, capable of supporting rapid growth and development of plant tissues, were formulated. Terminologies such as: single cell culture, ovule or embryo culture, anther culture, and meristem culture emerged, all of which contributed towards the rapid progress of this new technology.

CULTURE TECHNIQUE

The method of tissue culture involved growing plant tissues (*e.g.* stem, root or petiole sections) on sterile nutrient medium. The usual components of a nutrient medium consist of various inorganic essential nutrient elements, sucrose, vitamins, amino acids and growth regulating substances. Tissues are cultured in either agitated

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liquid medium, or on solid medium obtained by addition of agar. After some length of time the cultured tissues, if they are not contaminated with exogenous or endogenous micro-organisms, normally expand in size and callus tissues begin to form. The callus tissues can then be induced to differentiate into plantlets possessing roots and shoots, and are capable of normal growth.

The type and growth stage of tissues, and suitability of nutrient medium (quantitatively, qualitatively and sequentially) used are important variables determining the success or failure of a culture. Numerous successes in tissue culture have been reported and the following are a few examples: orchids (Teo *et al*, 1973); chrysanthemum (Jaacov, 1972), sugarcane (Nickell, 1973); rice (Nichi *et al*, 1968); pineapple and taro (pers. comm. Mapes, Dept of Agronomy, Univ. of Hawaii).

The author started tissue culture work in September 1973, on joining this University. It is surprising to note that mangosteen (*Garcinia mangostana*), rubber (*Hevea brasiliensis*), chiku (*Manilkara zapota*), papaya (*Carica papaya*) and sugarcane (*Saccharum officinarum*) can be easily induced to form callus tissues (*Fig. 1*). The time taken for callus tissues to form is reasonably short. (*Table 1*), and the method used in obtaining them is similar to the general method discussed earlier.

Table 1. Number of days required for excised plant tissues to form callus tissues.

Tissue	*Days*
Chiku *(Manilkara zapota)*	8
Rubber *(Hevea brasiliensis)*	8
Papaya *(Carica papaya)*	12
Sugarcane *(Saccharum officinarum)*	14
Mangosteen *(Garcinia mangostana)*	32

Two main problems have yet to be solved, after callus tissues are available. The callus tissues must be kept vigorously growing so that rapid multiplication of callus tissues can occur. Experience indicates that tissues may turn brown and subsequently necrotic unless properly managed. The callus tissues must differentiate into plantlets if they are to be of any use.

Though these tasks seem formidable, one would not expect them to be beyond solution. The words of Nickell and Torrey (1969) seem appropriate; "regeneration of plants from callus and cell cultures has now been accomplished with enough species to consider that it can be done with all plants—only the technical details remain to be worked out for each individual case."

POTENTIAL OF TISSUE CULTURE

In the context of Malaysian agriculture, tissue culture may have potential contributions in the fields of plant propagation, breeding, pathology, physiology, and economy.

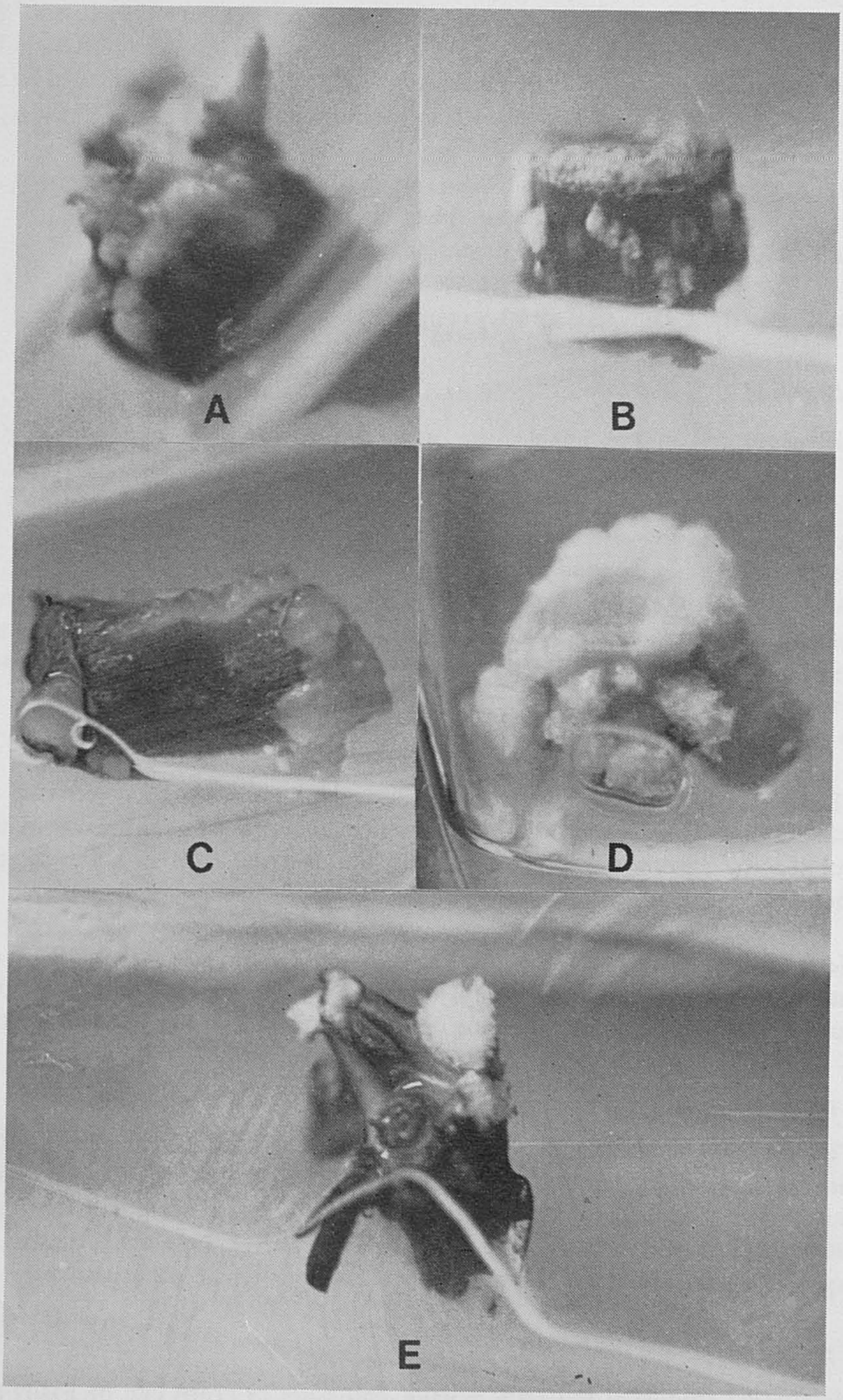

Fig. 1. Callus tissues obtained from stem sections of A) chiku (Manilkara zapota); *B) rubber* (Hevea brasiliensis); *C) sugarcane* (Saccharum officinarum); *D) papaya* (Carica papaya); *and E) mangosteen* (Garcinia mangostana).

Plant propagation

The greatest impact tissue culture has had, is on the orchid industry. Morel (1960) was the first person to show that slow-growing plants such as orchids can be vegetatively propagated by tissue culture method. To-date, numerous rare orchid species and hybrids are made available in quantities to growers the world over.

The possibility of propagating chiku, mangosteen, oil palm and other important economic crops in Malaysia has not been reported, though its feasibility is not beyond reach. This paper demonstrates that callus tissues can be easily obtained from chiku, mangosteen, rubber, papaya and sugarcane. Whether plantlets can be obtained from these callus tissues remains to be seen.

Plant breeding

Tissue culture method enables the rapid attainment of variations and homozygosity in plant populations. Genetic variations can be obtained by treating the callus tissues with mutagens, *i.e.* radiation or chemicals. Induction of polyploidy can be carried out by colchicine treatment of the callus tissues. Nickell (1973) reported that the phenomenon of "chromosomal mosaic" exists in sugarcane. Five cells isolated from the same tissue of a sugarcane clone did not grow to resemble each other or the parent. Plants derived from each cell showed differences in their growth performances. Later it was found that these cells have different chromosome numbers, and once isolated and made to grow separately, each cell provides a new source of variation.

The culture of rice pollen grains from desirable plants has been reported (Oono & Niizeki, 1968). This haploid plant can be turned into fertile, homozygous diploid by doubling the chromosome number of the callus tissues. Hence, the fixation of desirable characters in an individual can be achieved rapidly.

Certain seeds in the breeding programme may not be able to germinate due to various germination barriers. Excision of embryos from these seeds, and growing them on media devoid of the influence of their parental material is always possible.

Plant pathology

Tissue culture method may potentially contribute to the development of disease-resistant varieties in crops. The group at Hawaiian Sugar Planters' Association led by Nickell (pers. comm., 1973) treated sugarcane callus tissues with toxins from various pathogens. Cells that may eventually grow out of these toxin-treated media are expected to acquire natural resistance to that particular pathogen.

Plant physiology

Nutritional studies of the cells, organs, or tissues of crops can be easily carried out by tissue culture method. Responses of cells or tissues to various sources or forms of nutrient elements can be studied with exact precision without confounding the observation due to their transformations in the soil, as in field experiments.

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(2) Oil Palm Fruit Harvesting Nets (3′ x 3′)

(3) Oil Palm Loose Fruits Collection Nets (15′ x 15′)

(4) Cocoa Loading/Harvesting Nets for pods and seeds (4′ x 4′)

(5) Lorry Security Nets for Transporting Fresh Fruit Bunches

(6) Cargo Handling Nets

(7) Cargo Separation Nets

(8) Safety Nets for Building Construction

(9) All types of Fishing Nets and Ropes made of Nylon, Nylon Monofilament, Polyethylene, Saran/Nylon, Kuralon, Teviron.

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Item..... for.....pieces required

Item..... for.....pieces required

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Control weed growth with Ansar 529. It works fast – kills everytime. Ansar's effective and long lasting control of tough weeds makes it economical to apply in your estates and plantations.

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Growth, growth rates, and morphogenesis studies can be carried out. Factors affecting the desirable characteristics of a particular crop can be defined with great precision; for example factors affecting the quality and quantity of latex production in rubber or juice production in sugarcane may be studied. Defining the metabolic pathway of latex production may lead to the eventual discovery that cells may be made to produce latex in test-tube. Then the day may dawn when latex is harvested from "cells in tanks" rather than from trees.

Nickell (1965) demonstrated the use of tissue culture method to study phytotoxicity of various herbicides to the cells. Responses of cell or tissue to various herbicide treatments may give an insight into what may occur in the field with similar treatments.

Economy

Besides the relative ease in which scientific studies can be conducted by the tissue culture method, time and space can also be saved. The venue of research is shifted from the field to the test-tubes in the laboratory. For example breeding of disease resistant varieties is made simpler and cheaper when done in the test-tube than on growing plants in the field. Attaining homozygosity of a promising cross by field method is time consuming when compared to chromosome doubling of a haploid plant performed in the laboratory.

CONCLUSION

The potential of tissue culture in revolutionising certain concepts and methods in agricultural production is indeed promising. The various potential contributions discussed above are not beyond achievement. Given support and encouragement, it is reasonable to hope that some satisfactory results can be demonstrated. In the foreseeable future, plant tissue culture will surely provide another avenue towards achieving greater and faster progress in our efforts to attain increased productivity.

Acknowledgement. The author expresses deep appreciation to Dean, School of Biological Sciences for permission to publish this paper; Encik Patchamuthu s/o Ramasamy, Narhari s/o Thakorlal and Cik Khoo Guat Looi for their occasional help in the laboratory, and Cik Hajar Abdul Rani for typing the manuscript.

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Planter, Kuala Lumpur 49: 497–501 (1973)

PLANTATION MANAGEMENT IN THE SEVENTIES

We begin publication this month of a series of papers presented at the Society's symposium on plantation management held in Kuala Lumpur from 8–10 November. The introductory paper which follows was delivered by Mr W. L. Harvey JP FISP.

The development of estate management in Malaysia

W. L. HARVEY

The development of estate management in Malaysia cannot be separated from the development of estates and companies, and so I trace a brief outline of the origins of the industry.

Although a few adventurous souls had experimented with the planting on a commercial scale, of various crops in West Malaysia from about 1850 onwards (Penang Estates) it was not until the last few years of the nineteenth century and the first few years of the present one that the increasing demand for rubber, the good prices it commanded, and its almost illimitable prospects in the eyes of the farseeing, resulted in considerable areas being opened from jungle and planted with this crop, the material for which was freely available, owing to the devoted and single-minded work of Ridley and the original enterprise of Wickham.

Most of the pioneers of rubber planting in this country were individuals or syndicates, and these enterprising men obtained grants of land from Government and risked their all in proceeding with the felling, clearing and planting of their land. Some were already in the country, engaged in business or Government service, and some came from countries which already had plantation industries, mostly Ceylon and India. Those who succeeded and did not succumb to malaria or ill-fortune before their plantations were established, found rewards little less glittering and certainly more sure, than the fabled El Dorado. Further funds for development were easily obtained on the London Market, and many of the pioneers found themselves major shareholders and directors of sound companies with a good future.

Of Jebong Estate, where the popular tapping knife originated, Sir Eric Macfadyen wrote in 1906, and I quote—

> "On this estate we still get a return of between £40 and £50 sterling per acre per annum, on an investment of $26 (per acre). This place is this year making over 150% profit on the money laid out, and that although the place has been planted up successively in three different products—doubling the expense—before the decision was taken to plump for rubber and cut out the other crops. Of course, the shareholders do not draw 50%!".

Nevertheless the old Pataling Estate, where the satellite town of Petaling Jaya now stands, the parent estate of the great Company of today, paid 200% on its share capital for 1910, the greatest boom year; to preserve a just proportion, however, it must be appreciated that these splendid results applied to only a tiny segment of the plantation industry as we know it today. In 1910 Brazil was still the greatest producer of rubber, and production in Malaya was a mere 50 000 tons, compared with over 2 000 000 tons, from large estates in 1971.

Knowledge of the new crop had to be gained the hard way, with destructive tapping systems such as the herring-bone rapidly reducing the yields of the young trees before their harmful effect was realised and more conservative systems adopted. When companies had been formed, mostly on the London Market, their directors found that their interests could be most easily and reliably controlled by the employment of mercantile houses, some of them old-established firms, as local Agents and sometimes Secretaries, and hence developed the Agency House system which we know today. A few large Companies, who arrived on the scene later, adopted a different system of control, but with much the same kind of end-results. It was also considered desirable, following the Ceylon and Indian custom, to employ planting advisers or Visiting Agents to inspect and report on the estates, but to quote Sir Eric Macfadyen again—"To be quite frank, no one really knows much about rubber planting because it is such a new crop."

This applied to the Visiting Agents as well as to the managers to begin with, but these experts usually became known as being very keen on one or another aspect of the new learning, such as diseases of the tapping panel, and an irreverent character is reported to have greeted a new V.A. with the question, "Tell me, Mr. X, are you a Brown Bastard or a Mouldy Rotter?"

With the advent of Limited Liability Companies, with the command of ample funds from eager investors, such an era of development of the industry set in as was not seen again until the sixties. Not only were vast areas planted with rubber, but factories, with rail and monorail transport systems, were installed and complex end-products appeared even in the early days.

When I joined Lanadron Estate in 1928, the large factory there was 20 years old, and had been more elaborately organised and run than it was in 1928. In its early days it turned out a product which came to be known as Lanadron Block, and which was supposed to possess some of the desirable properties of the cured natural rubber from Brazil which still, at that date, was the principal produce to be marketed. This Lanadron Block involved some complex manufacturing procedures, including pressing in hydraulic presses and drying in a costly installation known as a Passbury Vacuum Drier, and it fetched the highest prices on the Singapore market for many years.

I have mentioned the Agency Houses as controlling most estates, and this system prevailed from fairly early days, but this control was much lighter and easier than it is now, and remained so for many years. Accounting systems on estates were more simple, and paper work, such as monthly reports, *etc*, less detailed and lengthy.

Work for the planter in the field was probably harder—more boot-leather and sweat—and certainly more detailed—we had no subordinate staff in the field on Lanadron—but much less hard in the office, and the hours from 2 p.m. (when the field labour knocked off) until 4 p.m. were dedicated to the siesta. Of course it must be realised that health and hygiene problems were far greater, and competent clerical assistance, both in office, field and factory, much scarcer than it afterwards became. So if one rather unhealthy estate had 10 Assistants for 2500 acres, at least 2 or more were off sick, and each Assistant on duty had to attend muster, receive latex, and keep both field and big check-roll, as well as giving the close field supervision necessary with inexperienced labour.

The scope of the Estate Manager was much greater than it has since become. His power to hire and fire applied not only to labour, but to Assistants and what used to be called Subordinate Staff, and he was responsible for most estate purchases, and even for calling in engineering firms for advice and work. This remained true until well after the first World War, and in some cases even up to 1939, since when conditions have gradually changed and organisation become more uniform with Agency Houses assuming ever greater responsibilities.

High prices for rubber, and the difficulties, mainly health, in the way of efficient costing made, to quote Sir John Hay, for that "easy profitability which results in extravagance in costs", and it was not until the mini-slump of 1921/22, and then the catastrophic fall in prices which occurred from 1930, that keen appreciation of costing became the rule on estates. In the great slump, indeed, lack of funds forced many estates into economies, such as cessation of drainage work and soil conservation measures, and neglect of weeding upkeep, which had to be paid for manyfold when profitability returned. Although clean weeding on hills was recognised as having been bad policy, the so-called "forestry system" which took its place in fact meant the occupation of large areas by undesirable species, which later had to be removed by changkol, as weed-killers and tractors were things of the future. In 1932/33 all-in costs per lb were as low as 5 cents, with wages as low as 25 cents a day, still far higher than the few cents a day a worker could earn on the small holding.

Managers and staff in many cases took cuts of 50% in salary. By 1939 most estates were back in good agricultural order and considerable areas of the oldest rubber had been replanted with high-yielding material.

I have not so far mentioned in any detail that vital component of the industry, Labour.

Although many of the pioneer plantations were opened from jungle with local Malay and Chinese labour, it is surprising to realise the extent to which newly recruited South Indian labour was used for felling and clearing jungle, especially in Kedah, Selangor and Perak. Indentured Javanese were imported in large numbers for work on estates, especially in Johore and Perak, but many of them chose to plant up and settle on their own smallholdings as their indentures expired, and by far

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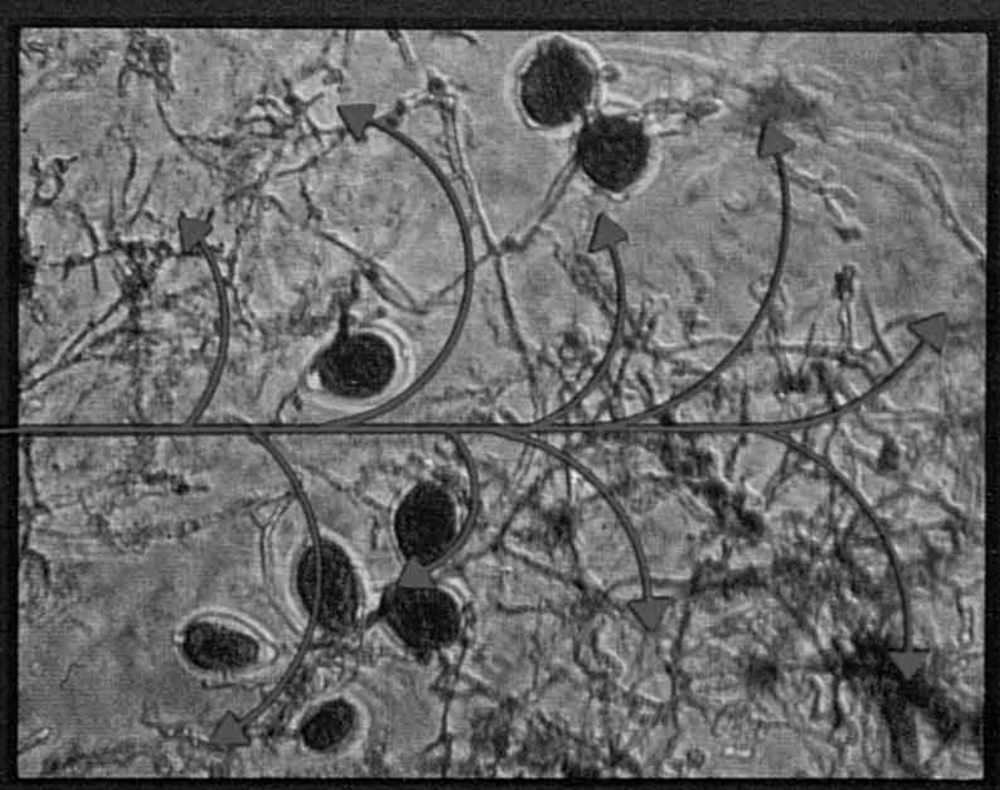
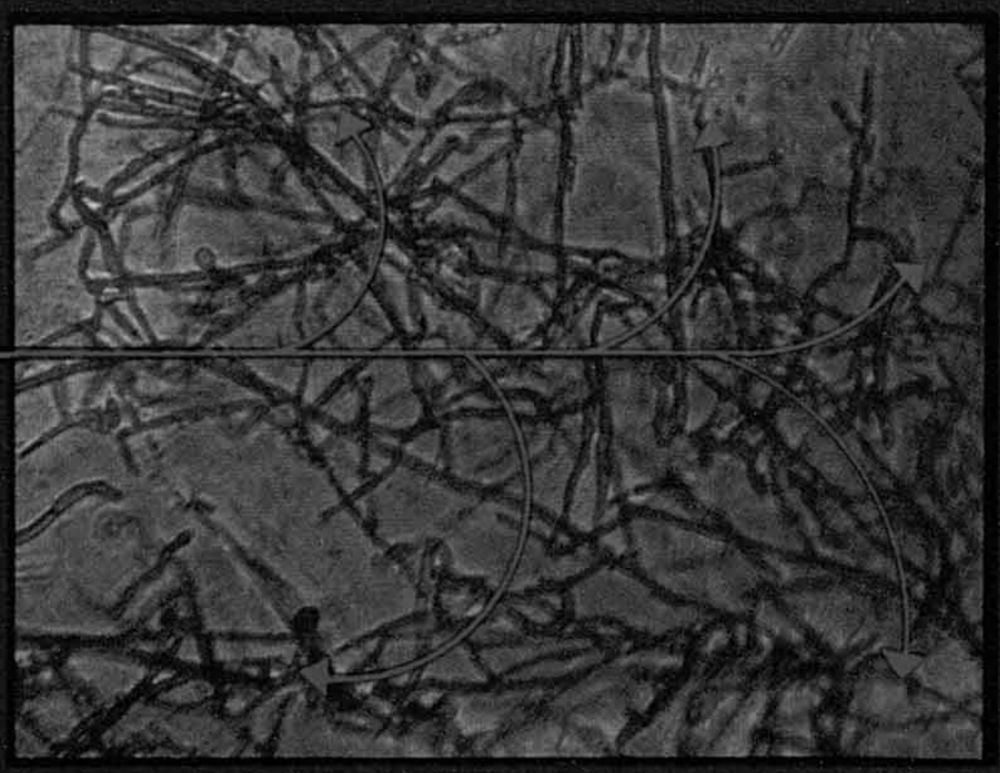


BLACKSTRIPE FUNGI—PHYTOPHTHORA PALMIVORA



MOULDY ROT FUNGI — CERATOCYSTIS FIMBRIATA

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DIVISION OF THE UPJOHN COMPANY, KALAMAZOO, MICH, U.S.A.

Shell Chemicals

the greater part of the estates' labour requirements were fulfilled by South Indian labour recruited from Madras by the Kangany system adopted from Ceylon. In the early days malaria exacted a fearful toll of death from newly-recruited Indian workers, until the work of Ross and especially of Sir Malcolm Watson in and for Malaya, reduced the incidence of malaria on estates to acceptable proportions. Before this, Government Health Officers and the Labour Department actually closed some estates to Indian labour until action to control this disease was taken. Thereafter, the main resident work force on most estates was South Indian employed on check-roll, although as time went on, and especially further extensions were undertaken by Companies after the first World War, the employment of Chinese through contractors for special works as well as for tapping became more usual as the influx of immigrants from China increased.

None of this labour was organised by unions until well after the second World War, and it may be thought that the power of the manager to discharge workers was almost unlimited, but this would not be true. Not only did any sensible manager realise that unless his workers were reasonably contented he would not get the best work out of them, but right up to 1941, and excepting the slump years of 1930/34, there was a shortage of labour on estates, except in the oldest planting districts of Selangor and Kedah, and in Johore and east Negri Sembilan it was not unknown for a manager who had incurred the displeasure of his workers to wake up one morning and find that they had all decamped, and had been removed in toto to another estate, sometimes in that estate's lorries!

Recovery of the industry after the war was rapid largely owing to the willing work of all concerned with their own prosperity, and owing to the liberal influx of funds from the companies. Post-war developments will doubtless be amply covered by speakers at this Symposium, but, broadly speaking, the three outstanding features of the post-war scene, apart from political changes and the Emergency, were the following: —

1. Almost total replanting of old seedling rubber, *i.e.*, the original plantings
2. Large-scale diversification into oil palms
3. The unionisation of labour and staff.

Regarding the first two of these, they have of course transformed productivity and enabled estates to operate profitably at commodity prices which, allowing for inflation, would have spelt ruin with the old plantations, they have necessitated a large inflow of company funds and, fortunately, an even larger flow of funds back to the companies as the new plantations became productive. In the fifties and sixties, requirements of finance for replanting of obsolete rubber, sometimes amounting to virtually the whole of the planted area of estates, and for the installation of modern plant in the factories for a variety of technically advanced rubber, as well as for the conversion of large areas from rubber to the African oil palm, were the chief causes of the great amalgamations of estates and companies which took place, although protection against the activities of the take-over bidder and the asset-stripper also inspired these re-organisations. The vastly improved productivity of estates has, of

course, enabled as well as justified the payment of the much higher wages which are now general, and which could not have been afforded even a few years ago.

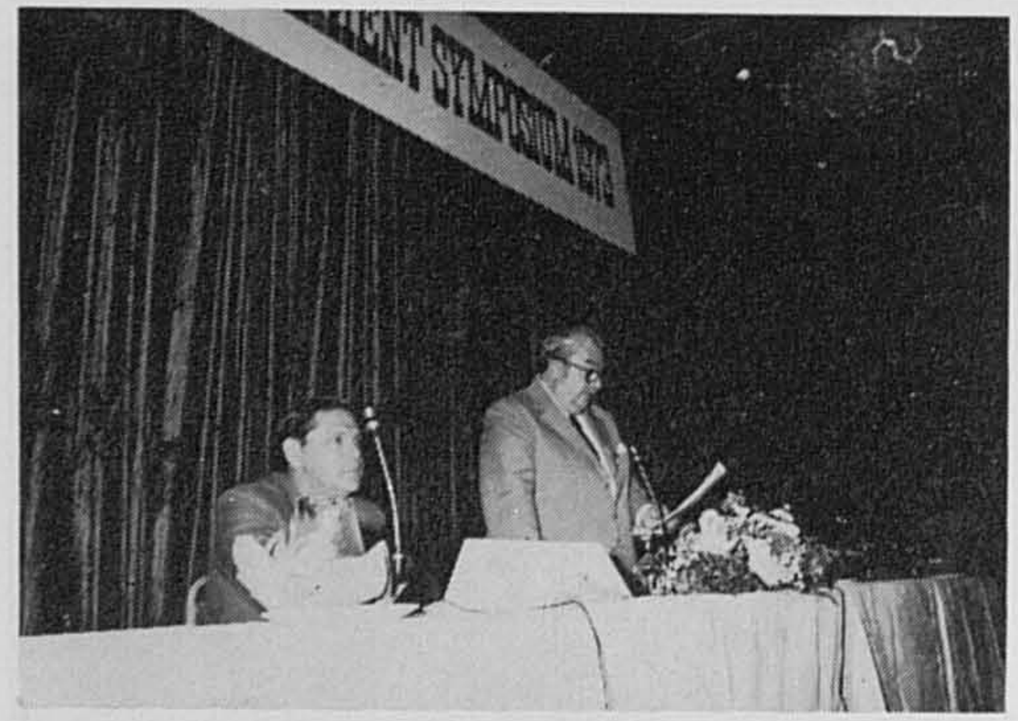
As regards my third point, the development of trade unions at first appeared strange and even at times unwelcome to the pre-war planter like myself, but he soon came to terms with the changed circumstances, and the greatly improved standard of living of the estate worker was a source of gratification to him.

The planter of today, and I left your ranks some years ago, has many technical problems and innovations to face and master, but the essential and always over-riding function of management is the retention of an adequate labour force, and the art of improving their productivity, while retaining their confidence and, if possible, their respect.

Function of an Executive

An Estate Manager has practically nothing to do except to decide what is to be done; to tell somebody to do it; to listen to reasons why it should not be done; why it should be done by someone else, or why it should be done in a different way; to discover that it has not; to enquire why; to listen to excuses from the person who should have done it; to follow up again to see if the thing has been done only to discover that it has been done incorrectly; to point out how it should have been done; to conclude that as long as it has been done it may as well be left where it is; to wonder if it is not time to get rid of a person who cannot do a thing right; to reflect that he probably has a wife and large family, and that someone else would be just as bad or maybe worse; to consider how simpler and better the thing would have been done if one had done it oneself in the first place; to reflect sadly that one would have done it right in 20 minutes and as things turned out one has had to spend two days to find out why it has taken three weeks for somebody else to do it wrong.

(From a speaker at the ISP Symposium on Plantation Management, November 1973.)



symposium (–z–), n. (pl.~*a*). **2.** Philosophical or other friendly discussion; set of contributions on one subject from various authors.

symposium (–z–), n. (pl.~*a*). **1.** after-dinner drinking-party with music, dancers or conversation; any drinking-party.

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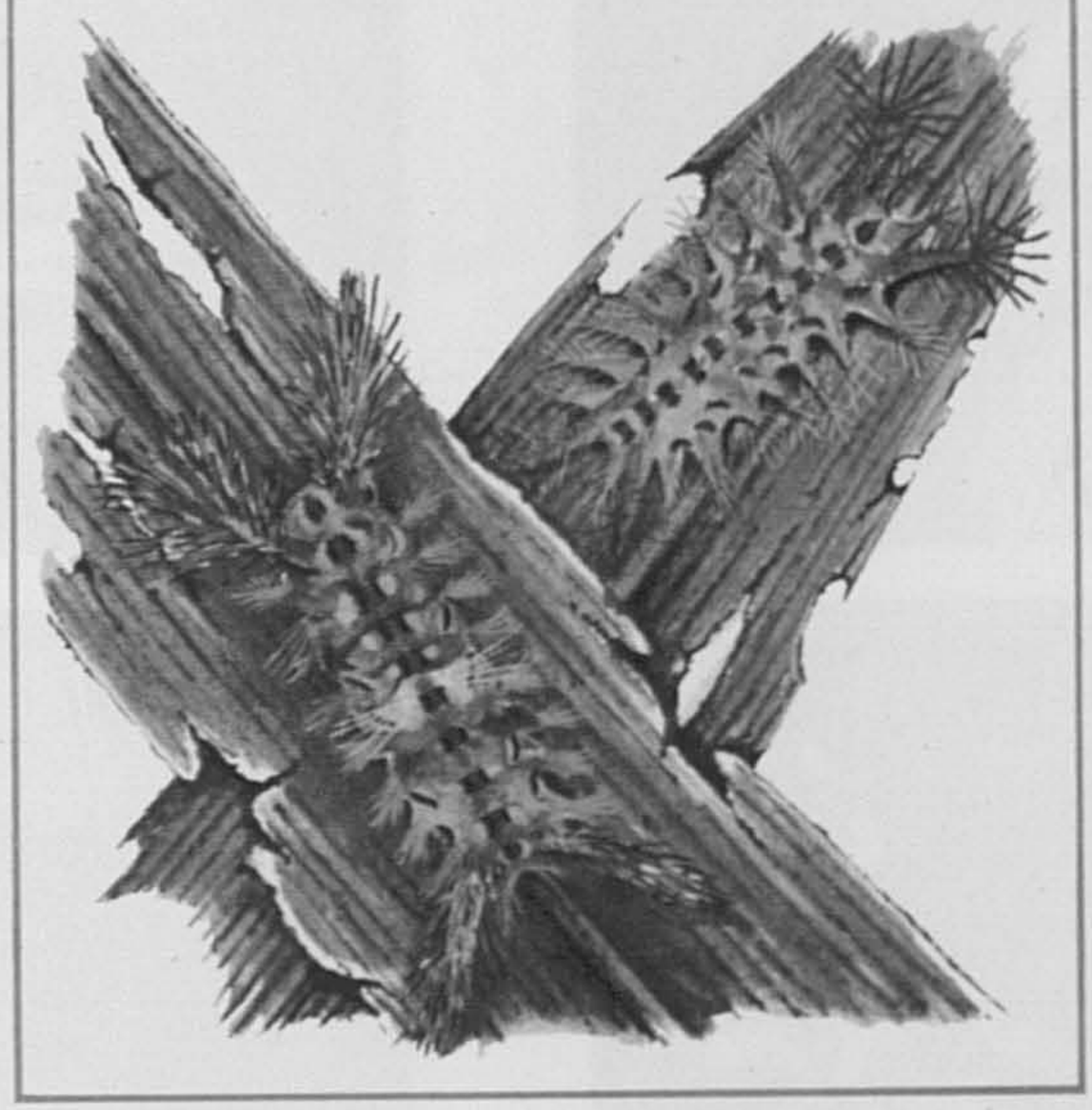

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Letters to the Editor

The Editor,
The Planter.

20 December 1973

Sir,

Basic Facts

Your November editorial contains unnecessary speculation as to what yields per tapping the Industrial Court had in mind when fixing the basic poundages; it is all set out on page 35 of the Award. For high-yielding areas (used as a basis for your argument) the average yield was taken to be 29 lb of latex and 5 lb of scrap, based on statistics given at Appendix G 1.

If as you suggest, basic poundages were expressed as a fixed proportion of the total yield rather than a number of pounds, the average yields could be agreed annually by the parties to the agreement based on the latest statistics.

I worked out the proportion represented by 22 lb out of 29 and it comes to 75.86%—though it seems doubtful that the Court had percentages in mind.

As you say, stimulation plus lower tapping frequencies will continue to widen the already huge gap between tappers' and other workers' pay; but your examples may be understating the case.

I know of a block of PB 28/59 (tapped at top of panel B) which in October this year, brought its tappers an average of $27.95 per day, with latex yields ranging from 160 to 190 lb per tapping. The tapping is fourth-daily but the trees are unstimulated! The tapper's monthly income, for 27 days worked in this area, comes to $754.65 and a husband-and-wife pair would of course have double this sum coming in. The same yields this month (December) will produce an even higher income as we are almost certain to be in a higher price-zone. Speaking of which, the present agreement does not cater for a selling price higher than 90 cents/lb so it looks as though MAPA and NUPW should be getting their heads together right now; let us hope they grasp the opportunity of creating a tappers' pay structure which is both sensible and lasting.

For what it's worth, may I suggest that they

(a) Fix the basic poundage at 85% of the previous twelve months' yield per tapping.

(b) Peg the incentive poundage rate at say, 8 and 10 cents (high and low yielding respectively) regardless of price zone

(c) Set the basic wage at $3.50 minimum for the 70/75 cent zone and below, with a price bonus of 50 cents for each 5 cent rise in the price zone—to apply to tappers and field workers alike.

This should make things much fairer to tappers, field workers and employers, but someone should work out a system of price bonus for monthly-rated employees.

Yours faithfully,
(*Sgd*) FAIR PLAY.

18 December 1973

Dear Sir,

In your November issue W.Y. joins issue with W.N. and pleads for the enrichment of English by the adoption of popular but hitherto strictly incorrect usage. It would be tidy (timely or seasonable as in the tides of the sea or Yuletide) to get this neat (clear or pure like a planter's drink), not just neat and tidy in an old maidish way.

As Sir Ernest Gowers has pointed out, some words improve in status and others deteriorate. So much that is done for prestige is indeed an illusion, deception or imposture, or at best prestige is a reputation derived from previous character or achievements, but that is not what is meant when large sums are committed to generate it. In our efforts to soften harsh criticism, words such as indifferent (impartial among other meanings) and mediocre (middling quality) have generally deteriorated in meaning. Cranmer's phrase that we may be truly and indifferently governed is repeated in many Anglican churches to this day; perhaps the Almighty has answered our prayers in modern usage.

Watergate has brought a flood of infinitives split by the negative, for example to not lay down the duty, to not erase, to not disclose and so on. However, we wander from the point raised by W.Y. Should be fight jargon?

If jargon is twittering, unintelligible gibberish, then yes we must eliminate it. But if we accept that jargon has an improved meaning, namely the technical vocabulary of a trade or profession, then we must accept it in this sense to facilitate communication and to economise in the space needed, which would otherwise continue to increase rapidly.

Yours

5433

(With grateful acknowledgements to the Shorter Oxford English Dictionary).

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22 December 1973

Dear Sir,

We would like to congratulate the editorial committee on a stimulating leader.

Whilst agreeing that an unsettled situation has arisen as a result of prices being obtained that were not anticipated at the time the agreement was signed, we feel that because the tappers are now getting good wages is not a sufficiently good reason to call for a complete reorganisation of the tappers wage structure. This is especially so when the present agreement was only concluded in 1972.

(Continued on page 509)

The monthly crop

Your annual subscription, if you haven't yet paid it, will already be overdue by the time you read this. The Society cannot function without adequate funds, and subscriptions are the principal source of these. Get out those cheque books please—or better still write to us for a banker's order form. Members who joined the Society on any date in 1969 now become liable for the higher rate of subscription.

Our best wishes for an early recovery from her recent illness go to Mrs Tan See Yeok, wife of the Society's chairman. Mrs Tan was very seriously ill indeed but is now getting better. She is one of several grown-ups we know to have recently contracted haemorrhagic fever (dengue) which, it seems, is not confined to children as reports of the recent epidemic have tended to suggest.

Participants in the Society's recent symposium on plantation management who stayed at the Kuala Lumpur Hilton are advised to check their bills—if they still have them. Some mistakes were undoubtedly made, especially in the matter of the 20% discount which should have been allowed on room charges. Some participants have already claimed and received a rebate from the hotel.

Ten Easy Ways to make all agricultural chemicals safe for you—and everyone else. This was the message carried by the leaflet enclosed with your November *Planter*. Graphic examples and sensible, easy-to-understand instructions make this notice absolutely required reading for your labour force. If you would like poster-sized editions for your estate office or dispensary, please write to us and we will ask the Malaysian Agricultural Chemicals Association to send you some. The instructions are printed in English, Romanised Malay and Chinese, but strangely, not Tamil.

Since the demise of its Car Club, the ISP is no longer represented in the motor sport world, yet many more members now own their own motorcars. There is a very good accessory shop in Kuala Lumpur which old Car Club members will know well but should be brought to other members' notice. Auto Accessories, at 55 Jalan Treacher, is a friendly concern where nothing seems too much trouble and prices are very reasonable. The AAM lists this shop as one of the favoured few where AAM members can claim a 15% discount on directly-imported goods from the UK, US, Germany, Italy and Australia. Auto Accessories, managed by Datin Tan, will shortly start advertising in *The Planter*. In the meantime, if you are interested in improving the appearance, comfort or performance of your car, pay them a visit and say you're an ISP member.

The Society's Annual Golf Competition attacted a very good entry and was played on Sunday 11 November on the Kampong Kuantan Club course. The results were as follows:

2 *Challenge trophies*	*Winner*	*Runner-up*
Jumbo Downs	Wong Non Lin	Pawanteh bin Din
Agency House Cup	N. C. Edward	M. W. Lindesay
ICI Cup	Chew Kong Yoon	J. Jayaraj
Shell Cup	Mohd Samsuddin bin Shafie	J. C. Lumsden
Tractors Malaysia	J. Dreyer	Yahaya Zakariah

Tiger Brewery Cup — Planters *vs* Agency Houses
Planters won 8 : 3

Special events

Longest drive	B. Galbraith
Nearest pin	J. S. Alexander
Highest no. of pars	A. B. Davidson
Highest no. of bogies	D. M. Benton
Best gross pair	J. S. Alexander & Noel Thong
Best nett pair	J. C. Lumsden & W. M. Cunningham
Wooden spoon	C. S. Thong
Best-dressed golfer	Tan Teo Kim
Highest score at hole 4	Abdul Razak Hashim

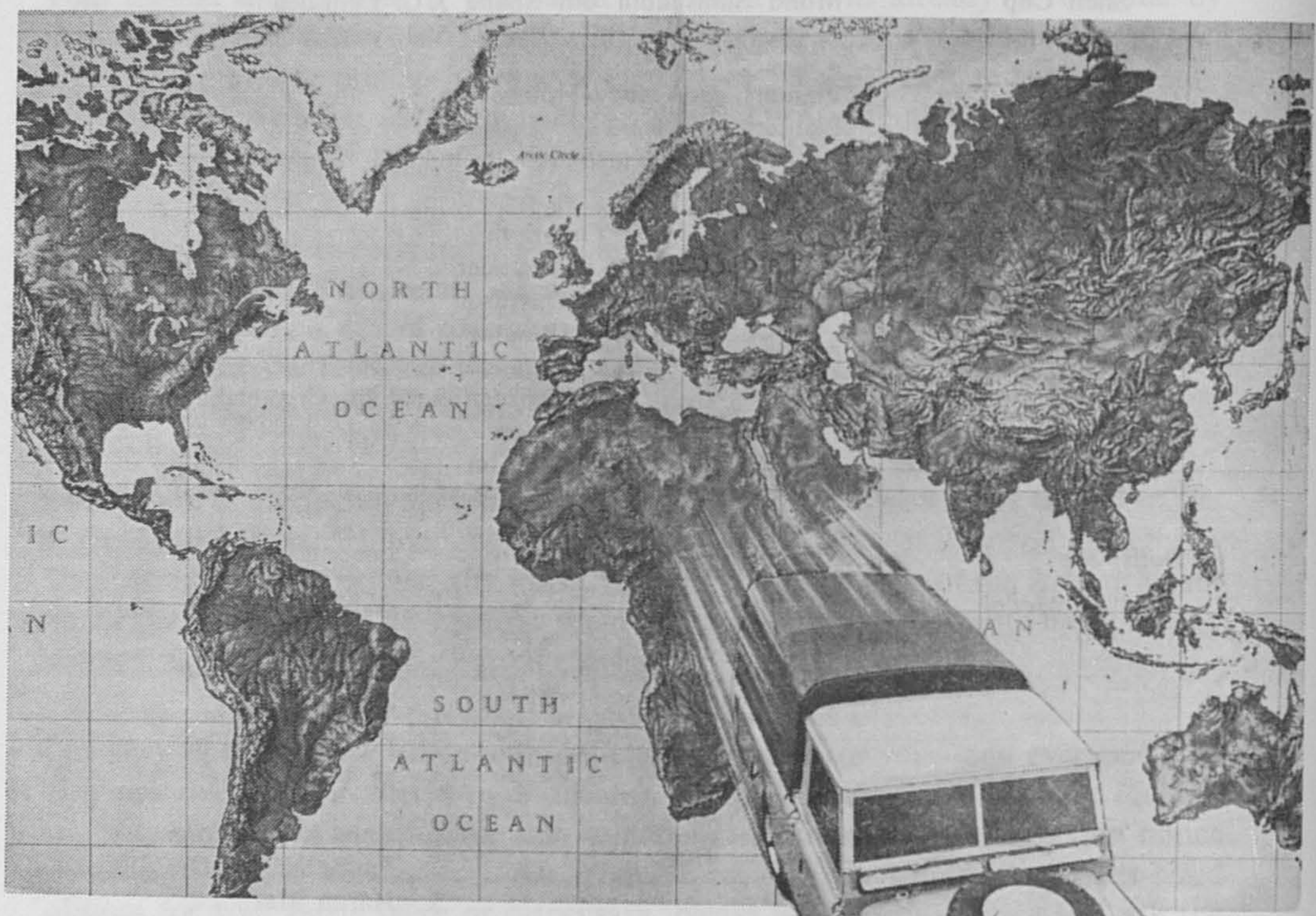
Ballsweep	*Stroke*	
"A" Medal	1st time	1. A. M. Jope OCB 2. D. M. Benton 3. Mohd Samsuddin
	2nd time	1. Wong Non Lin 2. J. C. Lumsden 3. M. V. Lindesay
"B" Medal	1st time	1. Chew Kong Yoon 2. Pawanteh bin Din 3. Harun Mat
	2nd time	1. Yeo Siow Poh 2. J. L. R. Jayatilaka 3. Pawanteh bin Din

Mr Noel Thong, who organised the competition, wishes to thank the following for their kind assistance: Messrs Khoo Khee Ming, J.S. Alexander, Chew Kong Yoon, the President and committee of the Kampong Kuantan Club, Mrs C.J. Sergeant, Mrs Maimie Alexander and all the ladies; also the generous benefactors who donated prizes.

Grave news from a member in Johore who swears he saw a notice outside a Singapore cemetery which apologised for 'operating with a skeleton staff'.

Laughterthought Arguing with a colleague as to the dubious merits of a newly-opened restaurant in Kuala Lumpur it was finally agreed that the place was not to be scoffed at.

182 countries can't be wrong!



Land-Rover has travelled the roads and worked the rough lands of 182 countries in the past 28 years of service. That's a lot of territory. That's a lot of rough, tough work. Land-Rover has seen Desert heat and freezing Arctic cold. Land-Rover has traversed mountains, jungles and swamps that were thought impenetrable. And Land-Rover has done all this with fewer mechanical breakdowns, and for greater economy than any other vehicle of its type. However tough the job you have in mind, Land-Rover will cut it down to size. Remember, there are at least 182 reasons for trusting Land-Rover!

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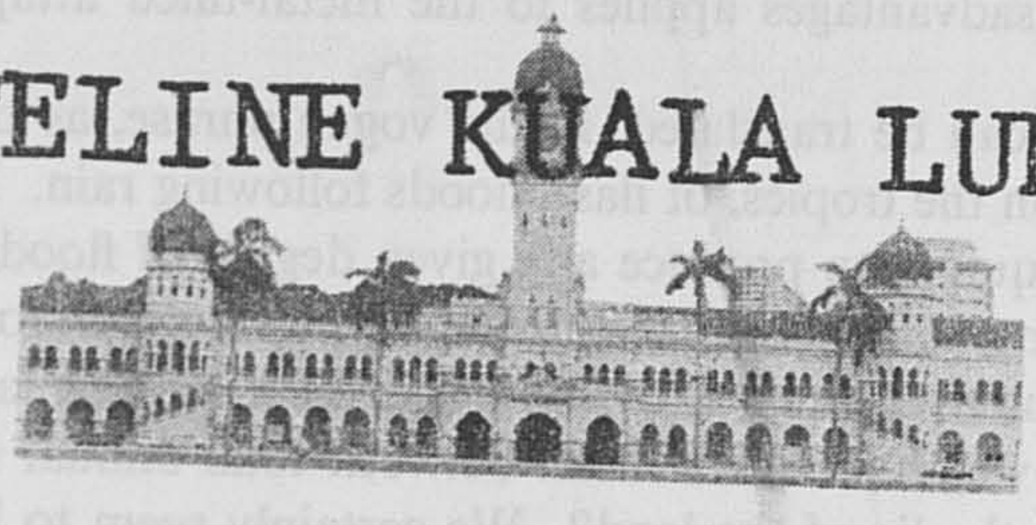
LAND-ROVER

DATELINE KUALA LUMPUR



The price of progress

Malaysia is probably the only country in the world with such a high percentage of its terrain occupied by primary tropical forest and containing so much timber in commercial demand. The sale of this timber overseas is a major contributor to this country's excellent economic position, the more so because the inevitable law of supply and demand has pushed up the price which buyers (notably Japan and USA) are willing to pay, far beyond the means of the majority of Malaysia's own citizens. The upshot is that the traditional Malaysian house, of timber roofed with attap, is beginning to disappear. Its complete disappearance would be tragic, both aesthetically and economically.

The rocketing price of concrete dwellings should be halted and, it is hoped, reversed in its course by recent legislation. We would now like to see legislation which enables the reservation of, say 25% of our forest produce for sale to our own citizens at a price commensurate with the average income.

The unfortunates who live within urban boundaries are unable to exercise any option in the matter of house-building materials as 'the planners' ordain concrete, presumably because of fire risk. It is a great pity that in places such as Kampong Bharu, it is not permitted to replace a picturesque old house with a new timber structure; concrete is compulsory.

Why should this be? NEB-approved wiring including an earth leakage circuit-breaker (ELCB) will eliminate the main cause of fires in buildings—faulty wiring. A sheet metal lining *inside* the rafters with attap outside would be highly resistant to fire spreading from inside the house and a further precaution could be the chemical treatment of the attap and rafters for fire resistance if not for complete non-combustibility. Failing this, why not fabricate rafters and attap from one or other of the plastic materials which worry the anti-pollution planners because of their indestructibility?

The normal sheet-metal roof is very attractive to lightning and, even when plastered with conductors, can cause the throwing of the ELCB switch several times during an electric storm. A metal roof makes the house unduly hot in daytime and a ceramic roof makes it hot at night. Heavy tropical rain on a metal roof makes such a din that hearing, reading or even thinking are rendered impossible.

None of these disadvantages applies to the metal-lined attap roof.

Urban 'progress' can be translated, in the vogue phrase, as the proliferation of concrete jungles and, in the tropics, of flash-floods following rain. In Kuala Lumpur, the amount of rain required to produce any given degree of flooding seems to grow ever less. Hasn't some town-planner/hydrologist produced a formula, relating to rainfall, which gives the maximum safe ratio of concrete to open land? If not, surely one could be devised which strikes a mean between total annual rainfall, maximum recorded fall-rate and the lie of the land? We certainly seem to have exceeded our 'concrete ratio' in parts of Kuala Lumpur at least, and one would like to hear of a systematic plan for 'blotting paper' areas to be preserved from the concrete invasion, in the manner of London's "green belt", although for a different purpose.

The exploitation of our forests without proper, if any, anti-erosion measures also contributes to urban flooding and is entirely responsible for rural flooding. We have again seen recently in Kelantan, how progressively less rain produces progressively more flooding. The steady diminution of land suitable for perennial crops continues and, if unchecked, will spread to annual and seasonal crops such as padi, almost certainly inhibiting double or triple-cropping anyway.

Flying over Malaysia, it is hard to find a river without a reddish-brown colour and the tell-tale 'mushroom' emanating from the estuary into the sea. Most fish cannot 'breathe' in such an environment and although, as *Straits Times* readers recently learned, crocodiles prefer muddy waters, it is doubtful if any riverine life can survive chemical pollution from rubber factory effluent.

As we have recently learned, this effluent provides an excellent medium for the cultivation of algae which, in turn, can provide a source of energy.

So here is another chance for legislation. Enforce the catchment of rubber factory effluent thus fighting the energy crisis and striking a telling blow against river pollution at the same time.

J. M. N.

(Continued from page 505)

In respecting the agreement, there can be no doubt that we should expect the same from the tappers and the highest standards of work only can be considered as acceptable at the present time.

What does bother us is the effects on morale of the supervisory staff if these high prices continue. The point was made in the editorial but the effects will go right through the staff list. If earnings of families are taken into account it will not be surprising to find them exceed that of some estate executives.

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Sugarcane beef in Barbados

H. George Dion*

A simple invention by two Western Canadians may soon help to bring about an important breakthrough in food production.

The greatest triumph of international development to date has been the Green Revolution, the dramatic upsurge of Asian rice and wheat production that has banished for the time being the spectre of mass starvation. Now a new era in beef production appears to lie ahead: cattle in Barbados are thriving on food processed in a new way from one of the world's most productive crops—sugarcane. Sugarcane has a tough, fibrous outer skin or rind which animals cannot chew easily, and which has until now effectively blocked its use as livestock feed. The breakthrough began with the invention by Robert Miller and Ted Tilby of Edmonton of a machine to split sugarcane and remove the soft, central pith that contains most of the sugar. A 3-year study, carried out by a team working for Barbados, under a Canadian International Development Agency contract, has demonstrated clearly that beef cattle can flourish on this sugar-rich pith when it is suitably supplemented by minerals, vitamins and sources of nitrogen.

Sugar, however, is only half the answer: the building blocks for growth are the proteins. Man, like most other animals, cannot manufacture protein so is dependent on protein from other sources—primarily plant protein, but also animal protein in the case of meat-eaters. Because we (animals and man) use proteins inefficiently, pessimistic futurists warn that our diets will become steadily poorer in meat as pressure on the land grows. With world population increasing they suggest we will no longer be able to afford the luxury of feeding a lot of good plant protein (suitable for human consumption) to livestock to recover a smaller amount of better animal protein in meat.

Short-circuiting the system

Animal nutritionists have recently learned that when the ruminant animals (cattle, sheep and goats) are fed material with little or no protein in it, the bacteria in their rumen (the first stomach) are able to convert urea, a cheap form of chemical nitrogen, into protein which can supply a large part of the animal's protein requirement. Sugarcane pith, an excellent energy source, has essentially no protein, but urea provides a source of nitrogen and works well with sugarcane pith in the production of protein.

We have therefore an elegant system for short-circuiting much of the wasteful step of first producing plant protein as livestock feed. In actual practice, about 60% of the growing steers' protein requirement can be met with inexpensive urea. Cattle thus become more efficient food-producers than our cheapest form of meat at present—poultry, which are completely dependent on plant protein—and the oft-repeated threat of the disappearing beef-steak is rendered invalid.

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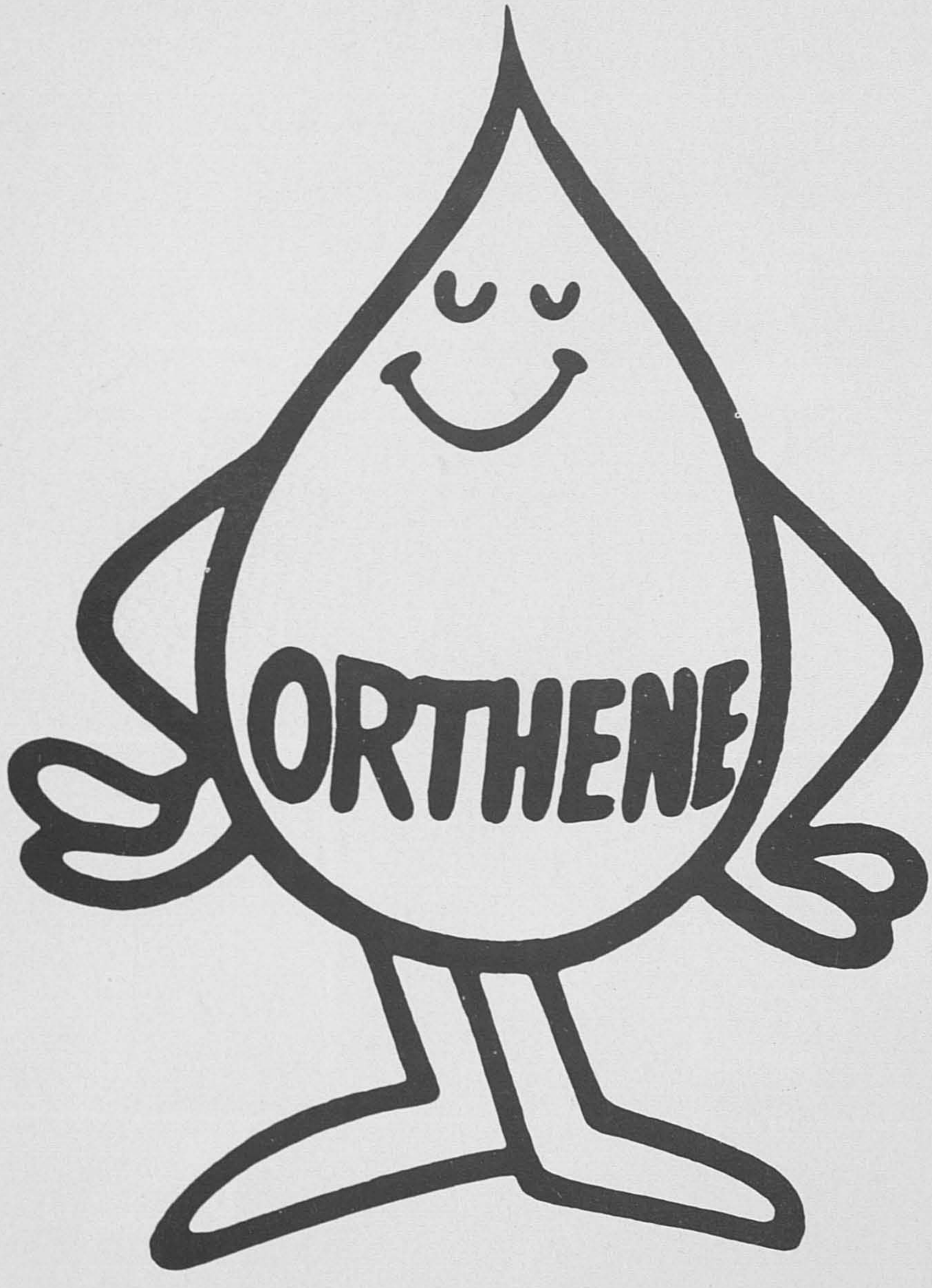
* Agricultural adviser: Canadian International Development Agency



THIS LITTLE DROPLET IS MAKING QUITE A SPLASH.

This short-circuit is only possible with the ruminants: cattle, sheep and goats. These species have a miniature microbiological fermentation factory in their rumen, populated by bacteria and protozoa, which processes raw materials rather as a brewery does. A brewery takes in barley (in the form of malt) and, by having yeast grow on it, converts the barley into alcohol and a lot more yeast cells, which are filtered off. In the rumen, the bacteria grow on chewed grass, perhaps doubling in numbers every twenty minutes and producing as well a lot of organic acids and other byproducts. The cow or sheep lives not only on the byproducts and the remains of the feed, but also on the bacteria themselves. Ruminants devour grass, but live on "meat"—the cells of the rumen bacteria! The particular advantage of the rumen bacteria from our point of view here is that they can manufacture protein from simple forms of nitrogen like ammonia and urea, and thus ruminants need less plant protein than do pigs, poultry or man.

Beef cheaper than chicken

Animals vary sharply in their meat-producing efficiency. Poultry, which can put on 1 lb for about $2\frac{1}{2}$ lb feed, are much more efficient than beef cattle, which produce one pound from about 5–8 lb of feed. However, this comparison assumes all feed to have the same value, and it is not usually energy or carbohydrate that limits growth—it is shortage of protein. Comparing the conversion of protein into animal products, cattle and sheep (which require only about one third of their nitrogen intake as proteins) will be the most efficient feed converters, in terms of protein. As the protein part of livestock feeds is the scarce and expensive portion, we can look forward to the time when beef and lamb will in fact be cheaper than chicken, because urea, which can replace much of the protein for cattle and sheep, is cheap and plentiful, and is easily manufactured from air and water.

One acre of an average sugarcane crop is productive enough to provide the energy feed for about four growing steers. A comparable figure for average grass in the tropics is about one steer per acre. Intensive livestock-feeding operations based on sugarcane on good land in the tropics can provide up to 3,000 lb of beef per acre of cane each year, as an alternative to the present system of extensive grazing on second and third-rate land.

Animal protein in at least small amounts in man's diet is a tremendous asset, as it both improves the quality of the diet and reduces the total amount of protein required. However, animal protein has always been very expensive, in terms of the land resources required to produce the plant proteins for conversion.

No longer wasteful luxury

The richest sources of plant proteins are not vigorous producers. In fact, a good corn crop produces almost as much protein per acre as a good soy bean crop. Sugarcane, supplemented with urea and fed to beef, will return about as much protein per acre as a good average soy bean crop, and produces it in the form of beef, our most valued source of protein. In the usual feedlot, when plant protein is converted into beef by feeding soy bean meal and corn, at least four pounds of

plant protein are needed to make a pound of animal protein. Less than one quarter of the acreage needed for high quality feed crops will yield the same amount of beef, feeding sugarcane and urea. Thus protein as beef will no longer be what the pessimists would call a wasteful luxury.

Sugarcane until now has been solely an industrial crop, dependent on processing through a sugar factory. Almost every island in the Caribbean at one time had its sugar factory and its cane acreage. As competition increased it became obvious that the places with more favourable climates produced sugar more cheaply. Some islands lost their factories and their cane, a serious blow to the economies and to labour on the smaller islands. In the tropics today you find either 10,000 acres (or more) of cane, or else, when the factory closes, none. With the new avenue open of feeding sugarcane to cattle, there is some point in having 10 acres or 100 acres of cane, and sugarcane production is no longer necessarily tied to large plantations.

Provides opportunities

Sugarcane for beef makes sense even in less-favoured climatic areas, as it is still a highly productive crop and will produce more per acre than any of the alternatives. It opens up new opportunities for islands such as Antigua where cane for sugar production has been unsatisfactory because of drought and uneconomically low yields.

Barbados is planning a thousand-head feedlot based on sugarcane pith, and hopes to meet at least some of the needs of her tourist hotel industry with this locally produced beef. Trials to test acceptability and taste have demonstrated that the meat will be in high demand, and that it is of first-class quality. Similar possibilities certainly exist in the other islands; in such places as Brazil and Colombia, where large cattle populations currently grow slowly on grass, the prospects of feeding operations on sugarcane are exciting indeed.

The long-term economics of the sugarcane-cattle complex indicate that it will in the end be cheaper and easier to feed cattle on sugarcane pith and urea plus supplements than with, for instance, corn and soy bean meal. In future, we are likely to see beef being exported from the sugarcane areas of the tropics to cities in the temperate areas.

It is clear that the next great breakthrough in producing still cheaper animal protein will come when we find and domesticate a small ruminant, which bears a large number of young in a litter, so that less of the feed input per generation goes into the maintenance of the breeding stock, and more goes into the weight development of the animals being grown for meat. The only domesticated species which begins to meet this requirement is the Barbados Blackbelly sheep, which produces a relatively high number of multiple births—three or four per litter is common, and five not uncommon. There is good reason for the suggestion that we may in the future be eating animals (and plants) that are unfamiliar to us today.

The "protein gap" is of vital importance in those parts of the world where sugarcane grows abundantly. The happy union between sugarcane, urea and ruminant animals potentially means much more abundant and cheaper meat particularly to those areas in the tropics subject to the protein deficiency disease, kwashiorkor. Mr Miller's machine has provided an answer, and our spaceship Earth has been effectively enlarged, because of a bright idea by a Canadian and the readiness of the Canadian Government to support it.

With acknowledgements to *Rural Life*, issued by The Institute of Rural Life at Home and Overseas.

VACANCY FOR A FACTORY MANAGER IN LIBERIA

A member working in Liberia is looking for a factory manager to run his factory and an extension to it which is being brought in early next year. Present equipment comprises a Promoci 8-ton unit and 6-ton crepe unit and the extension is to house a Guthrie 20-ton unit. Experience of the latest processing methods is essential, as is ability to carry out laboratory tests required for Technically Classified Rubber or at least supervise the laboratory staff, so as to produce a good, reliable TCR acceptable on the world market.

For further information please get in touch with ISP Headquarters.

Estate Practice Examination in Oil Palm

12 September 1973

(Marks in brackets; examiner's comments in italics)

PART 1 (3 hours)

The majority of candidates should read the questions more carefully and answer only what they are asked.

Although not taken into consideration during marking, it is disappointing to note the deteriorating standard of English and spelling in the papers. In some, even the names of pests were difficult to fathom, and it was necessary to guess which were being referred to.

One or two candidates greatly improved their answers by quick sketches.

1. a) How would you differentiate between a tenera fruit and a thin-shelled dura fruit. (2)

   b) Why is a 'dumpy' palm unlikely to yield as heavily as a normal palm. (2)

   c) How long should oil palm seed be 'pre-heated'. (2)

   d) Why is 'triangular' planting of oil palms preferable to 'square' or 'hedge' planting. (2)

   e) Give the correct size of a palm 'platform' for hilly country, and suggest a likely cost of construction. (4)

   f) What is the maximum acceptable slope for a laterite road used for transporting fruit by tractor or trailer. (2)

   g) How many chains per acre of harvesting paths, assuming a path in alternate inter-lines. (2)

   h) Suggest a suitable herbicide (and application rate) for eradicating *Clidemia hirta* in young palms. (3)

   i) Approximately how many fronds wil remain on a 6-year-old palm after a normal pruning. (2)

   j) How many harvesters are required for 1000 acres of 6-year-old palms. (2)

   k) What fertiliser could be used to correct boron deficiency, and how much should be given, for this purpose, to 6-year-old palms. (2)

Adequately answered by most candidates.

2. EITHER Describe five common insect pests of oil palms and suggest suitable control measures for each. (20)

   OR Describe in detail the technique of lining for planting in hand-felled jungle on undulating land. (20)

Many spent time describing the damage caused by the pests, which was not required. Few could describe the pests with any clarity, and sizes were hopelessly wrong. Control measures were known, but often the rather dangerous broad spectrum insecticides such as Dieldrex were recommended. Not a single candidate mentioned aerial application of insecticide.

It appeared that the few candidates who attempted this question had no practical experience of lining.

3. Suggest a method of estimating oil yields from plantations, at least four months ahead of harvest. What errors can be expected in this estimation, and how can they be minimised? (15)

Adequately answered by about half the candidates. One suggested writing to the estate!

4. Answer either (a) or (b), not both.

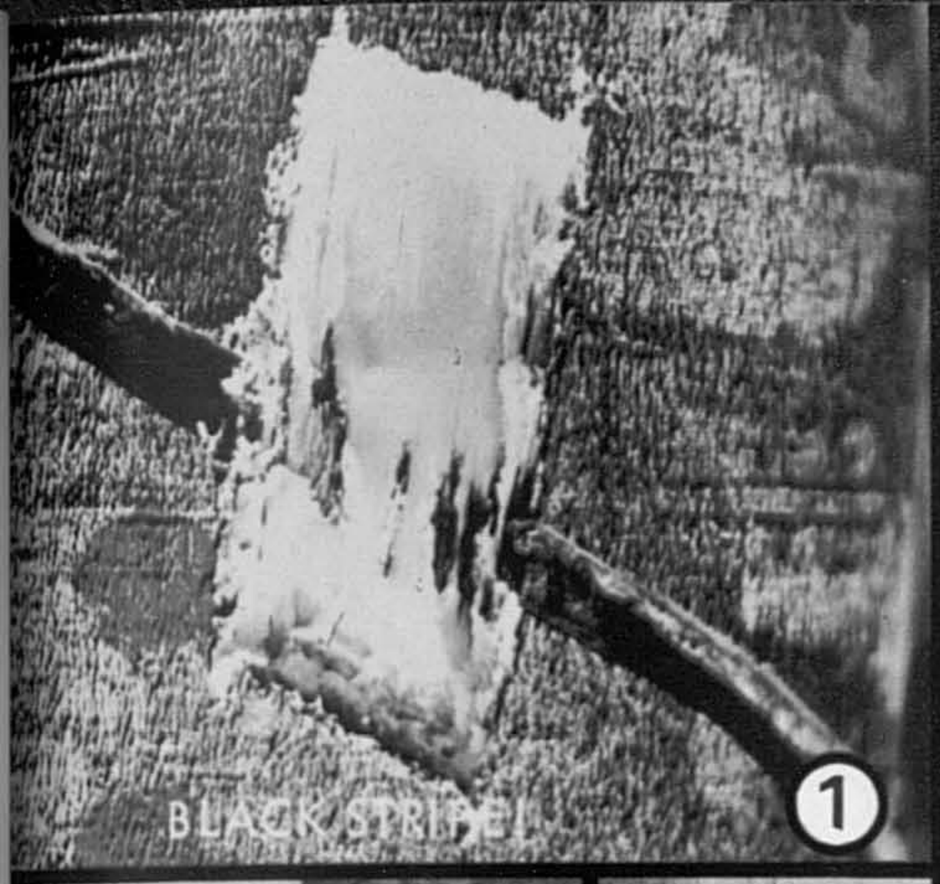
   a) Why is water conservation important on an oil palm estate? (20)

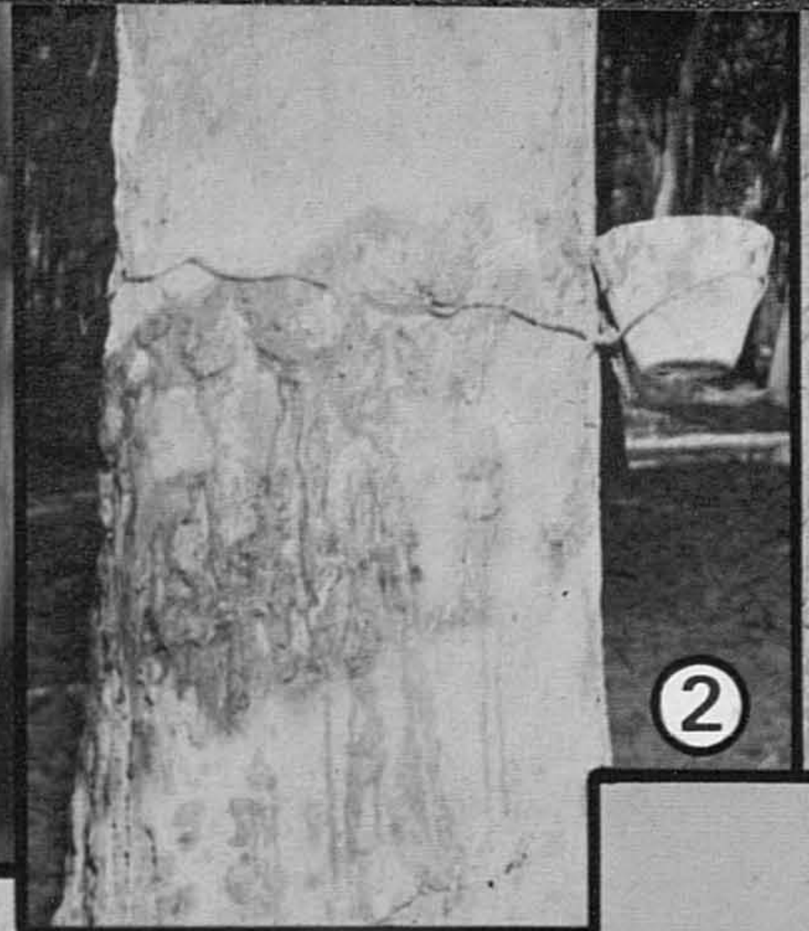
   b) Give a detailed annual budget for assisted pollination of 1000 acres of 3-year-old oil palms.

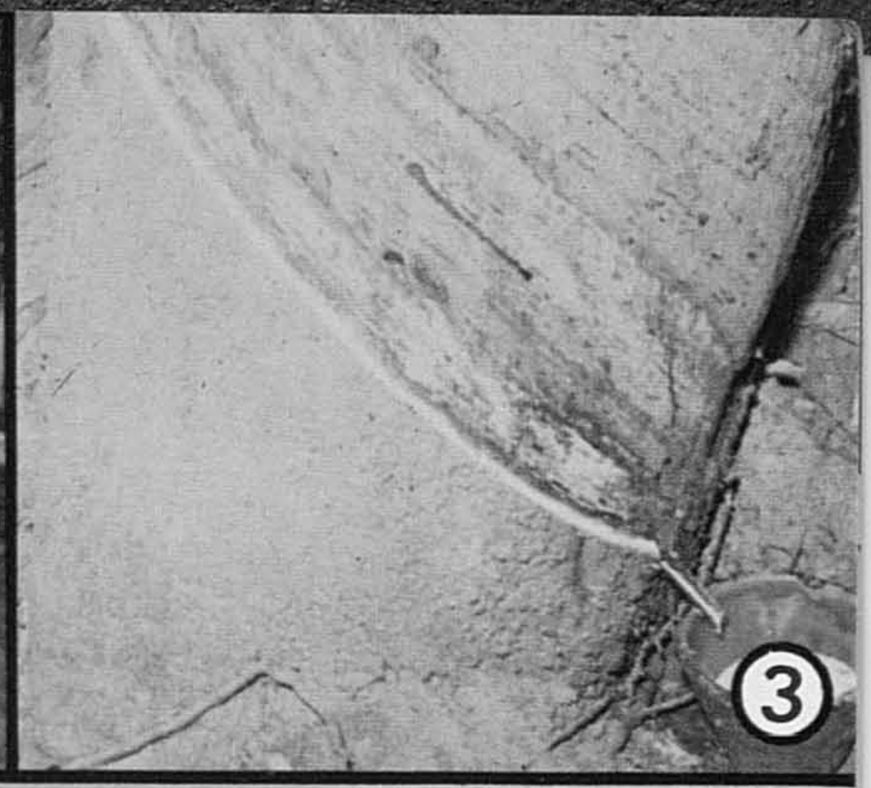
Only three attempted the first question, presumably because they knew even less about assisted pollination. The second was answered reasonably well.

5 Write brief notes on four of the following in relation to oil palms: Crown Disease, Brown Germ, Low volume sprays, Acid-sulphate soils, Rhizobium inoculation. (20)

Low volume sprays and acid-sulphate soils caused considerable problems but, otherwise, candidates at least knew what they were writing about, although none wrote 'brief notes'.







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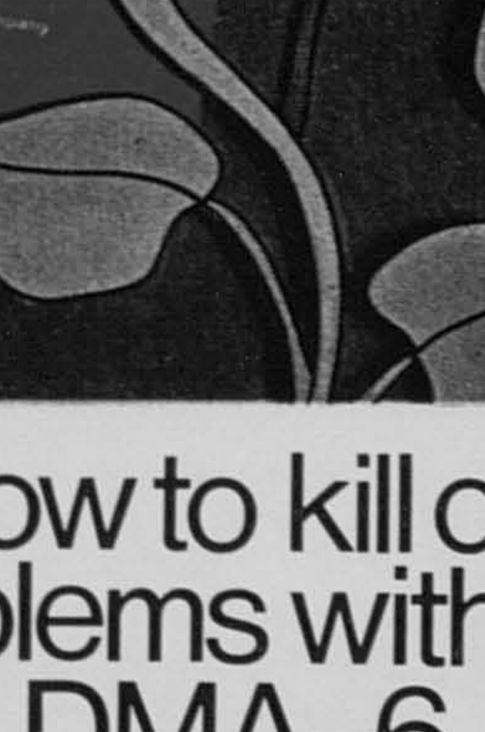

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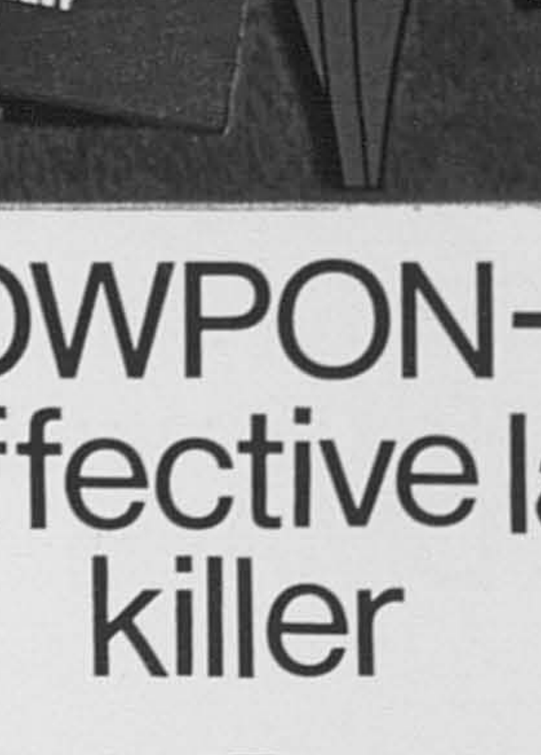

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Agricultural Science (Botany) Examination

14 November 1973

(Marks in brackets; examiner's comments in italics)

1½ *hours*

In general, the answers were much better than usual although several candidates lost marks again because they answered one or two questions very well but could not keep up their standard for the remainder.

1. Give an account of the structure and function of the leaf of higher plants. (25)

   Well answered in practically all cases.

2. What is xylem? Give an account of its distribution and uses in higher plants. (25)

   One good account was received but the remainder were mediocre. Some accounts were vague and mentioned xylem without indicating its structure and functions. Marks are not awarded for irrelevant accounts.

3. Write short notes on any five of the following subjects:—Companion Cell, Spore, Gamete, Fibre, Root Hair, Hypha, Nucleus. (25)

   This was not well done as candidates did not give sufficient information on any of the subjects which were chosen.

4. Write a short account of the transpiration stream in plants, indicating how it may be affected by external factors. (25)

   This was fairly well answered in practically all cases.

5. Describe the life history of a named fungus and give some account of the use of fungi in agriculture. (25)

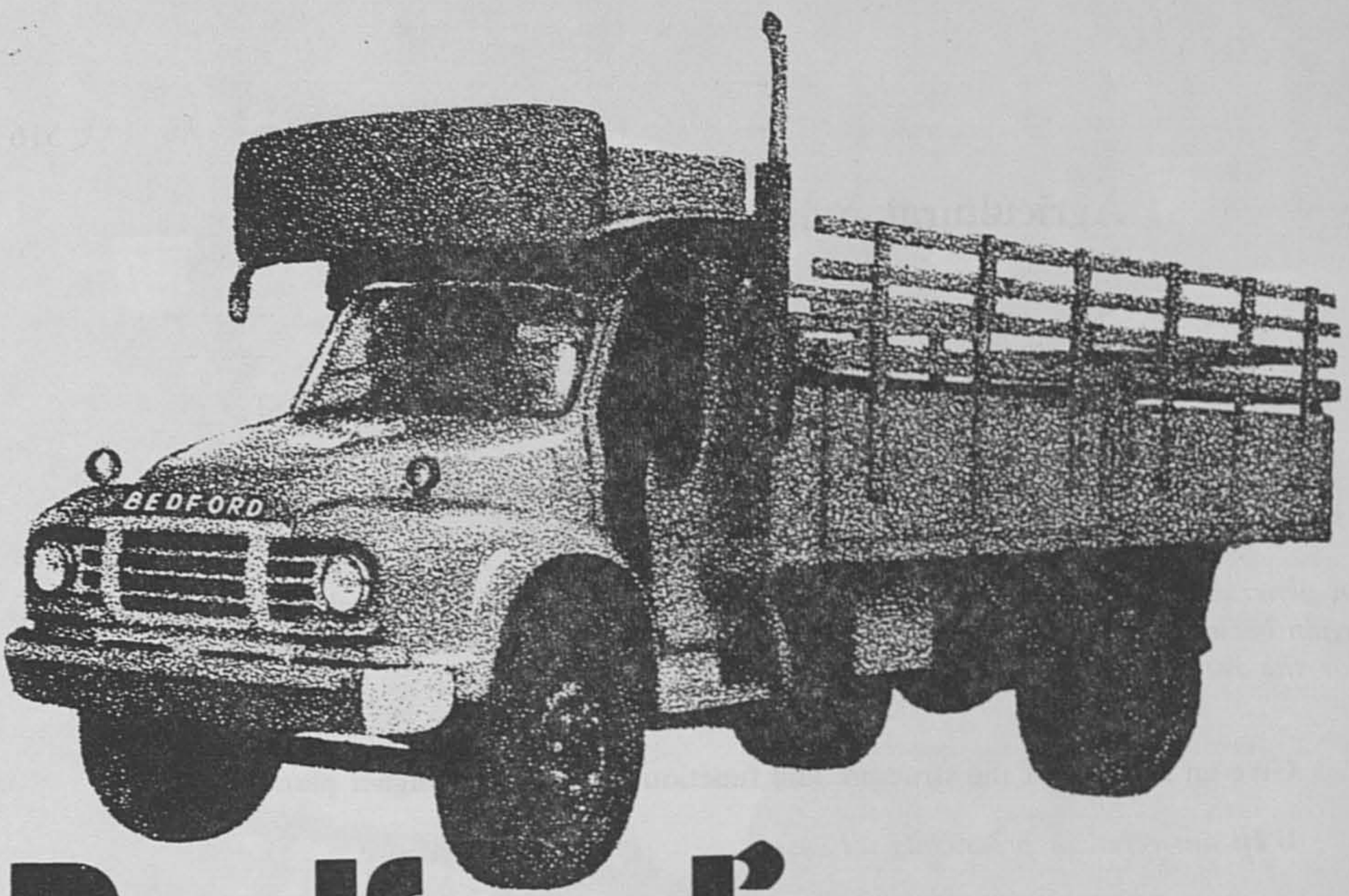
   Only one good account was received and the remainder were poor. Most candidates had very little idea of the role of fungi in agriculture.

6. How do plant cells absorb mineral salts and water? Describe a simple experiment to demonstrate this process. (25)

   This was reasonably well answered and in most cases candidates quoted an experiment. The main weakness was in the account of the first part of the question.

7 Write a short account of flower structure and its modifications. (25)

   No candidates attempted this question.



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Social and Personal

Award of Associate Diploma

Mah Siaa Pong, Dip NRP — (Malacca/Muar)

EXAMINATION SUCCESSES

Agricultural Science — Botany Section

14 November 1973

Thomas Ong Hong Tong	(Lower Perak)	Passed with Distinction
Siew Mun Chee	(Selangor)	" " "
Thong Seng Heong	(Selangor)	Passed
Mah Siaa Pong	(Malacca/Muar)	"

Marriage

TURNER — RUTTER: The marriage took place at Llanyravon Methodist Church, Cwmbran. Monmouthshire on 8 December, 1973 between Peter (FISP) and Olwyn (KLM).

Deaths

GREEN: C. H. on 31 August 1973. (Life member — 1399).

PACKHAM: Norman (4252) suddenly in Ipoh, on 10 December 1973.

On leave

5391 Awell, Hollis, 2 Astana Road. Kuching, Sarawak.

3729 Pirie, A W, c/o 59 Morningfield Road, Aberdeen, Scotland.

4796 Silvester, R A, AISP, Flat 6, 3 Portarlington Road, Bournemouth, Hants, England.

4204 Campbell, T J, AMBIM, 19 Stanmore Court, New Dover Road, Canterbury CT1 3DS, Kent, U.K.

5607 Ding Hong Sing, Andrew, AISP, 1115 Pekan Gurney, Sitiawan, Perak.

Returned from leave

4954 Allen-Edmett, B, Gomali Estate, Gemas, Negri Sembilan.

4745 Dixon, R B, NDA, AISP, Sungei Senarut Estate, Batu Anam, Johor.

5118 Hesselink, J W, c/o B F Goodrich Phil. Inc., P O Box 423, MCC, Makati — Rizal, Philippines.

3491 Macpherson, D A, AISP, Segamat Estate, P O Box 501, Segamat, Johor.

4561 Taylor, J G, North Labis Estate, Labis, Johor.

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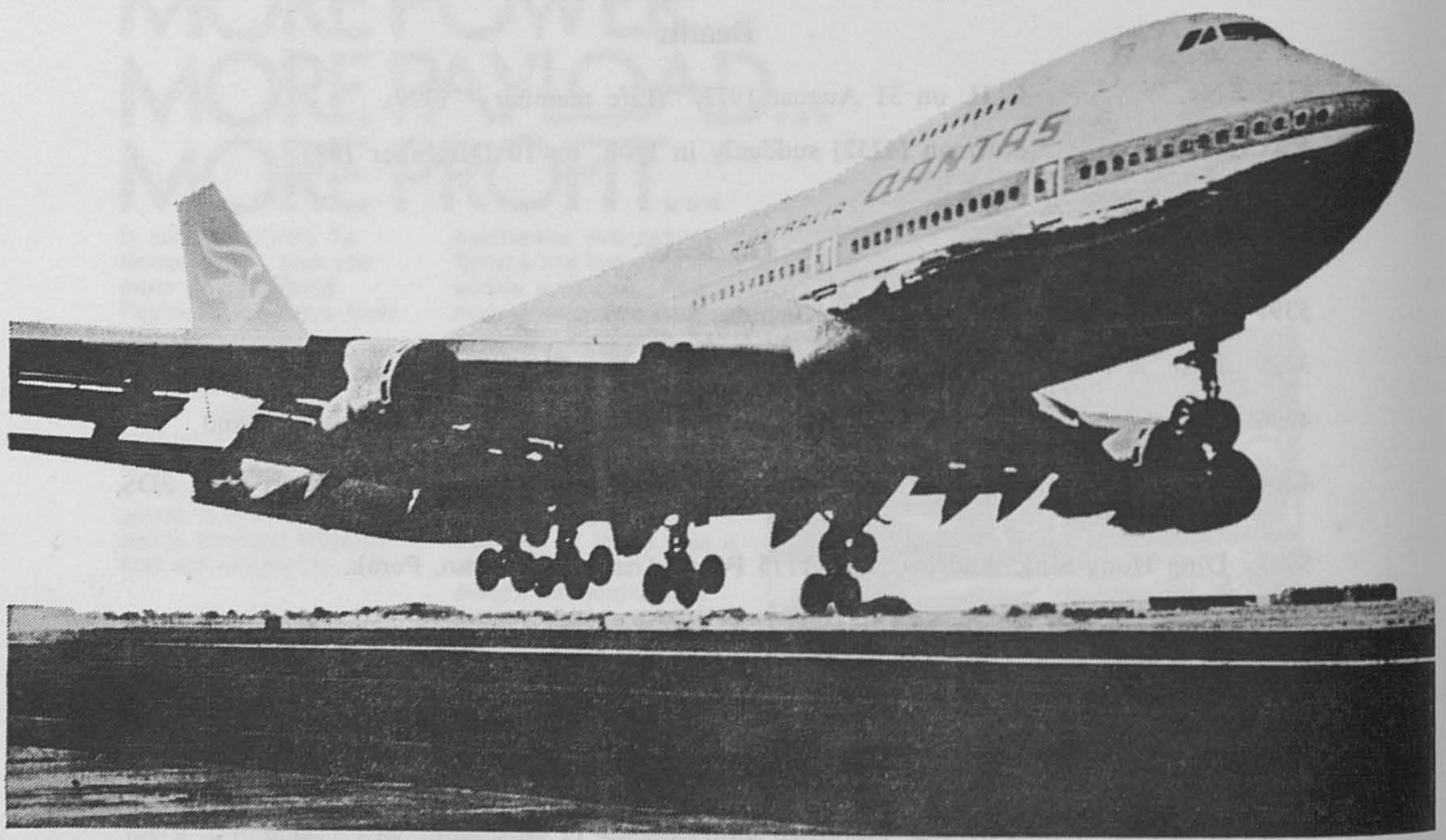

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Change of address

5472 Amjat Yusoff, Sungei Buloh Estate, Bukit Rotan, Selangor.

5952 Anii, Geoffrey, Levers Pacific Plantations Pty Ltd, Yandina, Russel Group, British Solomon Islands Protectorate.

5690 Ariffin bin Osman, Bukit Rajah Estate, Klang, Selangor.

5028 Ballard, J S, NDA, MRAC, Suma Plantation, Private Mail Bag, Kavieng, Papua New Guinea.

3948 Barnett, G R, Cape Rodney Farm, Cape Rodney, Leigh, Rodney County, North Island, New Zealand.

5735 Choo Ann Lock, Francis, Hoechst Malaysia Sdn Bhd, 305 Padungan Road, Kuching, Sarawak.

5623 Ching Tan Leong, 49 Lorong Kampar, Ipoh, Perak.

5669 Hamzah bin Jaafar, Seteshen Penyelidekan MARDI, Peti Surat 525, Kluang, Johor.

5055 Ismayuddin bin Abdul Manan, Uniroyal Malaysian Plantations Sdn Bhd, P O Box 350, Penang.

4998 Leask, J C, CEP Rengam, P O Box 106, Rengam, Johor.

5363 Lee King Wat, Dip Agri, AISP, Sungei Krian Estate, Bagan Serai, Perak.

4932 Lee Kim Kiong, Segamat Estate, Segamat, Johor.

5899 Mohd Kamal bin Abdul Salam, Felcra, P O Box 3, Temerloh, Pahang.

4577 Nawi bin Haji Ali, Haron Estate, P O Box 204, Klang, Selangor.

5802 Noor Faadi bin Ahmad Din, Wessyngton Estate, Rengam, Johor.

5318 Sekhon, B Singh, AISP, Bukit Mertajam Estate, P O Box WD 309, Kulim, Kedah.

5346 Tay Seng Pang, AISP, Euromedical Industries Sdn Bhd, P O Box 1, Sungei Patani, Kedah.

5608 Teoh Ban Tong, Lembaga Kemajuan Tanah Negeri Sabah, Rancangan Tamang, P O Box 359, Tawau, Sabah.

5589 Wong Ah Lim, No 6, Jalan Suka, Sunrise Park, Kluang, Johor.

5943 Yeo Sin Bin, 66-8 Jalan Haji Jaib, Muar, Johor.

5850 Balachandran, R, Sepagaya Estate, P O Box 298, Lahat Datu, Sabah.

5266 Lian Kwen Min, AISP, Tangkah Estate, Tangkak, Johor.

4999 Liew Sip Kee, 32 Main Road, Bagan Serai, Perak.

2754 Laursen, A, "Solbakken", Sanderumvej 269, 5250 Fruens Bøge, Denmark.

4651 McManaman, G M, Hillside Estate, Seremban, Negri Sembilan.

5237 Mohd Yunus bin Mohd Aris, Kempas Kelabang Estate, Paloh, Johor.

5261 Murthy, P M Sathyah, Tasso Estate, Kangar, Perlis.

5764 Ong Hong Tong, Thomas, Kamuning Estate, Sungei Siput, Perak.

6024 Samsunder, R, Tanjong Malim Estate, Katoyang Division, Tanjong Malim, Perak.

5479 Standley, C G, 25A Lorong Tanjong 'D', 5/4D Petaling Jaya, Selangor.

5501 Veluppilay, C, Malaysian Co-operative Industrial Development Society Bhd, P O Box 817, Kuala Lumpur 01-16.

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