

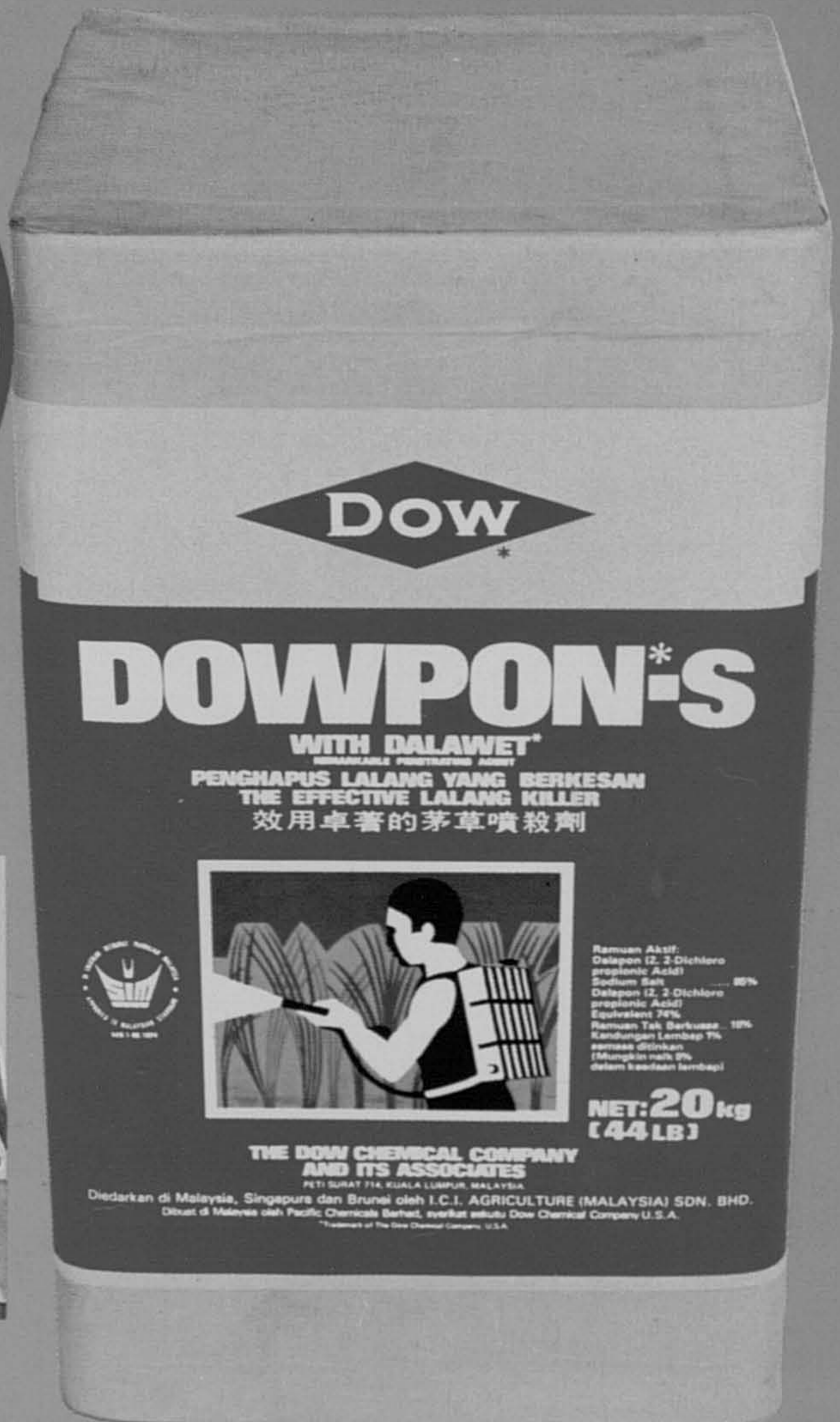
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SEPTEMBER 1976
KDN 9432 Vol. 52, No. 606

The Planter



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The Planter



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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

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The Planter



KDN 9432

MAGAZINE OF THE INCORPORATED SOCIETY OF PLANTERS

- (1) *The Planter* is published monthly from the Society's Office at 1, Pesiaran Lidcol, Kuala Lumpur 04-06, Malaysia.
- (2) It features original technical articles in tropical agriculture, for the benefit of the planter (in active service or practice), papers relating to the Society's Technical Education Scheme, and other contributions of more general interest.
- (3) The magazine's current print order is 2 000 copies and this is steadily rising.
- (4) *The Planter* is read in some 51 countries*.
- (5) Copies are exchanged with a wide range of agriculturally based institutions.
- (6) Subscription copies go to 32 countries.
- (7) Annual subscription is M\$36, including postage by surface mail.
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Editorial:

POLLUTION - AND THE PLANTER

During the past century (almost!), the planter has played varying scientific, technological and social roles in Malaysia.

In the very early stages of this country's development, or opening of land from the jungle, as development was then regarded in practical terms, the planter was well and truly considered a pioneer. Planting in those days had to be deft, decisive and dictated by a sixth sense, almost uncanny and perhaps unneeded to the same extent under conditions of technological innovation now prevailing.

When the elements behaved, trouble could come through the 'tar road' from town ... to those hardy Malaysian counterparts of Davy Crockett. Laws were occasionally meant to be broken, or at least ignored. For, wasn't getting on with the job more important, especially when it meant keeping the wheels of economy turning? What if, in that process, a minor crack at the Establishment recurred now and then?

Things could be explained over a 'pint' ... if that wasn't sufficiently 'potent' the 'stengahs' helped to cement the consensus—after all, the man was only as good as his word and none should break a *janji*.

In those halcyon hours, however, the only criterion that was perhaps not *au fait* was the Environment, which, of course, did not quite exist in the same manner as today.

Plantations were usually well out of town (or at least 'far from the maddening crowd' of urbanism) ... even poets and painters calmly accepted the fact of the times that the countryside in Malaya (or other country of equivalent natural wealth and agro-industrial potential) was dotted with some 'iron horses' in the shape of rubber factories, palm (and other) oil mills that not only belched smoke, but also brought in the much needed dollars.

Where there was water (waste water that is) to dispose, such water often found its way out of the property into a natural outlet—be it a canal, stream or river. Ditches (or trenches) were dug only if gravity obstinately refused to oblige.

In the oft-quoted words of the euphemistic L.C.C. 'Chips' Sewerman, the maxim—when it came to waste disposal—was: "Don't stir it ... let it flow smoothly by!"

Malaysia indeed owes much to such idyllic innocents who were blissfully unaware of problems such as over-population, urbanisation, unemployment and—pollution!

Pollution has been defined as any act or aftermath, whether voluntary or otherwise which results in unhealthy, unsightly, and unaesthetic contamination of nature and her bounty.

Pollution can defile the land, the sea (or rivers, streams and canals) and the air ... in the context of the planter in Malaysia, all are equally undesirable and should be avoided to the utmost.

Above all, pollution could be a state of the mind, causing 'professional blindness to facts and fraternal needs of the Society' ... in short, it could be a serious cancer in Society, contaminating ecology and cracking down the environment.

Planters should become fully aware of the problems which pollution can bring about in our developing nation ... left unattended, it can choke a community's will to face the future, as is already happening to many communities in the advanced countries.

To them, it is already too late ... relocation is the only alternative. To us, however, time is still on our side, and given the will and the wisdom, the way can be found to beat pollution on our own terms—now and in the future.

Arming itself with the Environmental Quality Act, the Malaysian Government has embarked on its dialogue and discussion in its approach to the problem.

The front line of the battle has naturally been set at the border of the plantation and the mill in the case of emerging effluents, and at the chimney's end in regard to manufacturing industries.

Rubber and Oil Palm have now become the pioneers to show the rest of the nation how their processing wastes could be cajoled into giving up their persistent and problematic biochemical oxygen demands on mother nature ... it is still a malodorous, messy business all the way, despite the now speeded efforts of the industries to 'stop the stink from spreading'.

In the Committees and Councils which the Government has set up to promote consensus with the industry on the control of pollution, counsels with an eye on the future well-being of the nation must prevail.

To this end, the planter has a duty to provide the correct ground information on conditions which will have to be met before pollution can be controlled realistically, viably and with goodwill all round.

The big journey must begin but with a small step—knowledge and information.

It is our earnest hope that ISP members will continue to retain their reputation for the dogged pursuit of knowledge and the speedy dissemination of information through which alone industry, community and the nation alike can ever hope to tackle, let alone win, the war against waste matter.

What should we do about oilpalm epiphytes?

A G PIGGOTT and C J PIGGOTT*

SUMMARY

Plantation oilpalms support many epiphytes, predominantly ferns. Few of these have an adverse effect on yield and removal is usually of aesthetic value only.

Epiphytes appear on oilpalms soon after the first pruning and by the time the palm is ten years old they can conceal the trunk completely. It does not become bare again until the leaf bases drop and even then some of the stronger growing species remain, only to die within days of the palm being felled. Some Managers clean the palm trunks from time to time. Others leave epiphytes to grow quite uncontrolled. One Manager, at least, insists they are beneficial:

“Predators of leaf-eating caterpillars thrive in the deep shade of the ferns.”

On the other hand many reasons have been given for trunk cleaning:

“There is no place for snakes and other pests to hide.”

“Pollinators can see the flowers more easily.”

“Less loose fruit is lost.”

“Sanitation is improved.”

“Palms look better and this encourages neater work.”

There is also the somewhat negative attitude:

“Trunk cleaning costs too much.”

Epiphytes, by definition, do no direct harm to the palm itself. They are superficial and obtain their nutritional requirements from dust and debris. The healthiest palms and the heaviest bearers may have the most luxuriant epiphytes because this debris comes from the flowering and fruiting crown.

Parasitic plants are very different because they obtain many of their nutritional needs from the host. They are harmful to the palm but fortunately are few and only the genus *Ficus* is at all common (Fig. 1). Such parasites should be killed and removed as soon as they are seen. *Ficus* spp. may not always kill palms but they always reduce yields.

* Chemara Agricultural Services, P O Box 134, Seremban.



Fig. 1. *Ficus* sp. parasitic on an oilpalm.

Oilpalms frequently occur 'wild' on roadsides and some have been planted as ornamentals. They remain unpruned. The trunk is heavily shaded by the long leaf bases and epiphytic plant growth is discouraged. But more important, debris from above only collects in the uppermost whorl of fronds. Little, if any, filters further down. Within months this litter disappears and, because more fronds develop above, it is not renewed. Few epiphytes grow, and only occasional creepers climb from the base of the palm.

However, regularly-pruned palms on plantations provide an excellent habitat for a wide range of epiphytes. There is plenty of light, and litter in the short leaf bases is continually renewed from above. It consists of the remains of male flowers, bunch residues, bird and rat droppings, leaf fragments and loose fruit. Water is funnelled downwards and finds its way into these pockets of litter—natural plant pots. Any seeds or spores which lodge in them have a good chance of germinating and developing into plants (Fig. 2).



Fig. 2. Young fern in frond base.

'Soil' whether halfway up a palm or on the ground is much the same. Thus terrestrial plants can become epiphytes of oilpalms as can those species which are normally found on old roadside trees. Shallow-rooted species, plants with runners or creeping rhizomes, and those which are resistant to intermittent drought are obviously favoured. This explains why most of the epiphytes are ferns. Orchids, for some reason, rarely occur although at first sight growing conditions would appear ideal.

The epiphyte with the widest distribution is *Elaeis guineensis*, the oilpalm itself. In the past fruits were caught in the leaf bases. They eventually germinate and produce young palms (Fig. 3). Careful pruning to keep these leaf bases as short as possible will reduce this fruit loss. In particular, when pruning by chisel the cut surface should be vertical rather than horizontal, trimming the frond close to the trunk. Pruning by sickle cannot be so neat. As the palm grows taller more and more places are left for fruit to lodge. Extended harvesting rounds result in more loose fruit, greater losses, and often semi-permanent evidence in the form of a collar of seedlings. In the presence of other epiphytes these losses may be magnified. The epiphytic oilpalms do not live long, and most die within a couple of years. They will be T x T crosses and the temptation to use them as supplies should be resisted.



Fig. 3. Oilpalm seedlings on the trunk of an older palm.

Nephrolepis biserrata is usually the first fern epiphyte to become established on the trunk of young oilpalms and several years pass before other fern species appear. At this time it develops from spores, presumably wind-borne, but then spreads by producing runners. The origin of these spores is obscure. This fern is not a common ground cover in young palms, particularly in new jungle clearings, and yet small plants of *N. biserrata* are found on oilpalms almost everywhere and long before any other epiphyte. Both the prothallus and the young sporophyte must be hardy in order to survive what would seem to be unfavourable conditions.

If the trunks of older palms are cleaned, *N. biserrata* soon reappears. It almost disappears when the leaf bases drop but may still be seen in the crown. Even where growth is vigorous *N. biserrata* is unlikely to cause much reduction in the amount of crop harvested, although a few fruit may be retained in tufts of dead fern stalks.

Whilst *N. biserrata* can be found everywhere related species do occur in some places. *N. radicans* has been identified on several coastal plantations in the north-west of the Peninsular, whilst *N. hirsutula* is present in North Johore. Both are somewhat similar to *N. biserrata* in growth habit. A fourth species, *N. acutifolia*, is not uncommon on old palms in Central Pahang and Central Johore. Its pale yellow-green pinnae are almost leathery, enabling it to survive the longest drought. The plants encircle the trunks and produce numerous long pendulous fronds (Fig. 4). Much litter, and many loose fruit, can be held back. For this reason *N. acutifolia* must be considered an undesirable epiphyte.



Fig. 4. *Nephrolepis acutifolia*.

The second fern epiphyte to appear on young oilpalms is usually *Davallia denticulata*. It is quite unlike *Nephrolepis*. The fronds are triangular, deeply dissected and can be 60 cm long and nearly as wide. Plants first appear near the base of the palm where there is a greater accumulation of debris. From there they spread upwards by means of a thick brown woolly rhizome which attaches itself to the leaf bases (Fig. 5). Spores are frequently produced. Because the fronds are produced in succession along this rhizome, rather than in tufts, loose fruit retention can only be minimal.



Fig. 5. *Davalia denticulata*.

Two other ferns are somewhat common on palms up to the age of ten to twelve years: *Goniophlebium (Polypodium) verrucosum* and *Asplenium longissimum*. Both have long pendulous fronds. Those of the former are often pale and velvety and can be distinguished by the round sori, sunk into the tissue and raised on the upper surface of the leaflets. *A. longissimum* has linear sori on the lower surface of the leaflets, and the leaf stalk elongates until a small plantlet forms near the end of the frond. No other epiphyte of oilpalms does this. Neither fern has a long creeping rhizome like that of *D. denticulata*. They produce tufts of fronds which may hold a few fruit. *G. verrucosum* does tend to form a large mass of leaves and could shelter pests (and predators?).

Stenochlaena palustris is only frequent in wet lowland and there it can be abundant both on the palms and on the ground where the fertility is low, for example on peat soil. After drainage it may disappear from the undergrowth, but its vigorous rhizome and very tough leaves ensure its survival on the palms, where it seems innocuous. Spores are never produced until it has climbed to full sunlight.

On older palms another genus of ferns is common, *Vittaria*. It has grass-like leaves with linear sori along the margins. Mosses too can often be found at this time. *Vittaria ensiformis* grows as single tufted plants with narrow leaves which are rarely longer than 15 cm (Fig. 6). Larger plants, with longer and broader fronds, are *V. elongata* and these often remain when leaf bases are shed. The tufted habit of this species is not so noticeable because the fronds droop to form a curtain covering the trunk. Sometimes this conceals the long ribbon-like fronds of *Ophioglossum pendulum*, an unusual fern producing an elongated, stalked fruiting-body from near the base of the blade. None of these three ferns can have any economic significance.

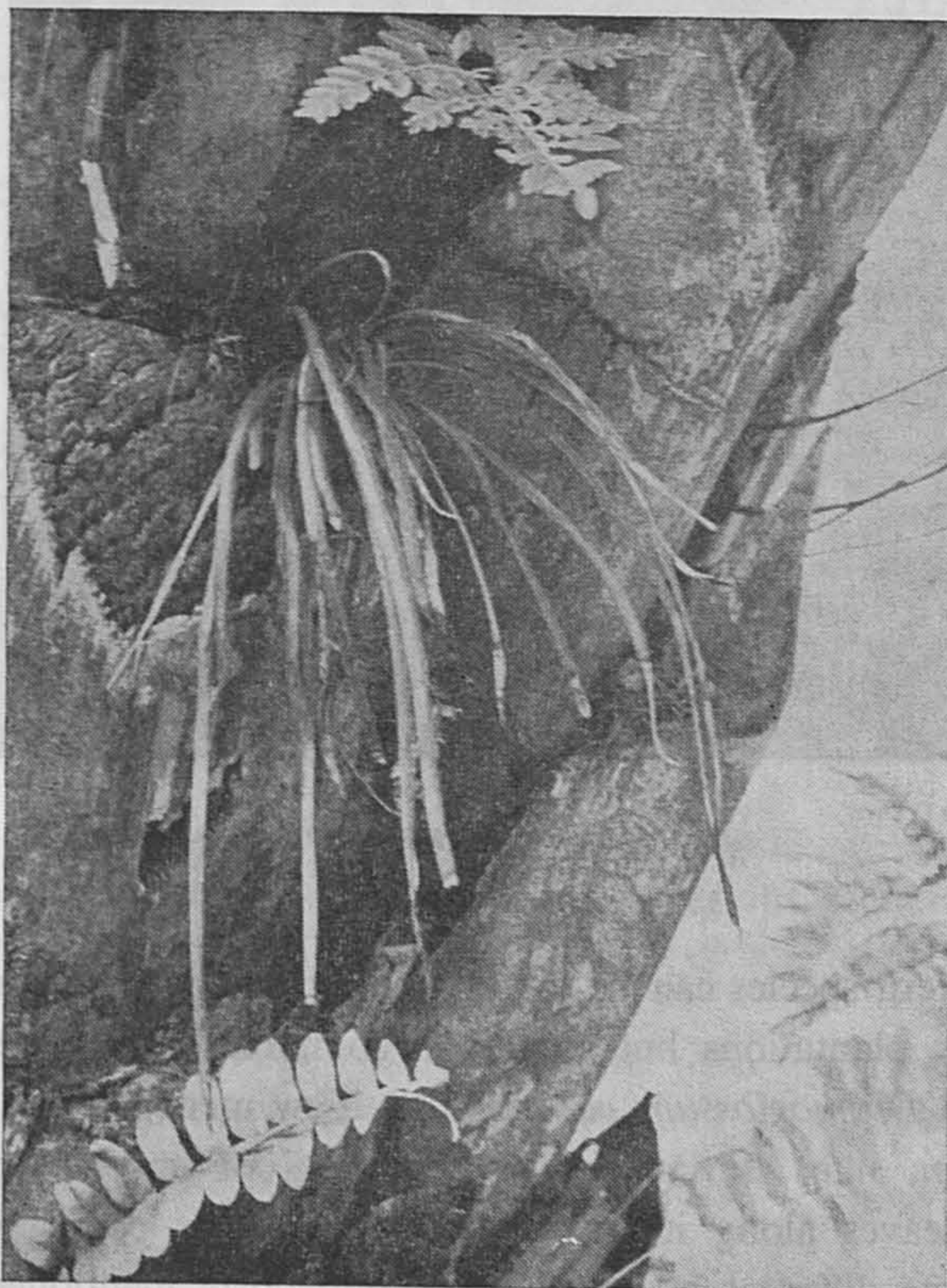


Fig. 6. *Vittaria* spp.

However, *Asplenium nidus* ("Bird's Nest" fern), a common epiphyte of trees throughout the Peninsular, can accumulate large quantities of loose fruit when well grown (Fig. 7). Its shape is specially adapted to the collection of debris. Young plants are frequently found on palm trunks. They are rarely allowed to attain maturity, although on one or two rather neglected plantations specimens large enough to hold a whole bunch have been seen. These plants should be removed.



Fig. 7. *Asplenium nidus*.

Many other fern species can be found growing as epiphytes on oilpalms. Most are infrequent on plantations but some are common on old trees, for example, *Pyrrosia* spp. and *Drymoglossum piloselloides*. Few merit special mention. *Microsorium punctatum*, like *A. nidus*, can cause loss of crop. *Drynaria sparsisora* produces 'nest' leaves along its rhizome. Both species could well be removed. Another fern, quite different in form to any previously mentioned, is *Phymatodes scolopendria*. Its leaves are tough, leathery and are deeply divided into lobes, commonly three or five, whilst the large sori are orange, oval and indented. It is found on both young and old palms, often remaining attached to the trunk after the leaf bases have fallen. Finally, mention must be made of *Sphaerostephanos polycarpus*. Its previously recorded habitat was in ditches and besides streams, where the water supply was intermittent. It is now becoming much more widely distributed and is not an uncommon epiphyte of oilpalms, particularly in the north-east of the country. Although fronds can be large, its open growth habit ensures that it can have little direct effect on crop.

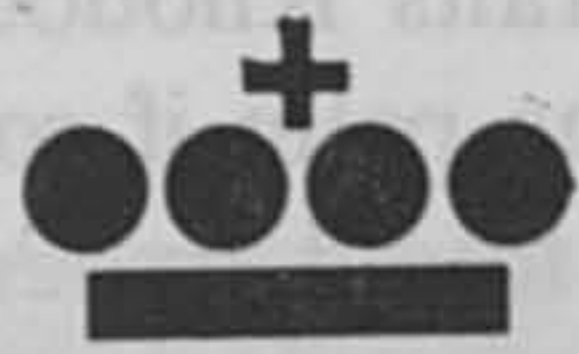
Although oilpalms are the commonest non-fern epiphytes other species, mostly terrestrial, have been recorded. Straits Rhododendron (*Melastoma malabathricum*) can spread from the inter-row to the palm if routine plantation upkeep is neglected. Even *Mikania scandens* has been found under those conditions—but not Lalang! In other places quite unexpected plants have become locally abundant: *Dianella ensifolia* and even *Begonia semperflorens*. They may be decorative but are agriculturally unimportant.

What should we do about all these epiphytes? Those which can definitely reduce the amount of crop harvested should be destroyed, but they only grow large on older palms and can be cut down with a picking knife at pruning or during harvest. Epiphytes on younger palms, and those near the base of older ones, can easily be killed by the herbicides which are used to clean the circles. Ferns were very susceptible to sodium arsenite, so much so that when this chemical was used for poisoning palms prior to replanting the epiphytes often died before the palm itself. Other, more-sophisticated, herbicides such as Gramoxone are nearly as effective, surprisingly so considering that they only kill green tissue. Palms 'cleaned' in this manner remain so for several months. The expenditure per acre is small although the total cost of palm cleaning can be substantial on a large plantation.

There is no evidence that pests, or predators, are encouraged by epiphytes. The additional shade and humidity they provide is negligible compared with that from the palm canopy itself. The volume of vegetation produced by epiphytes during the period that oilpalm flowers are receiving assisted pollination is unlikely to affect the efficiency of this operation, although it must be admitted that tree snakes occasionally hide within it.

It is easy to answer the question, "What should we do about oilpalms epiphytes?" Destroy those which might cause a serious reduction in crop. And the others? Please yourself—it won't cost much either way.

ACKNOWLEDGEMENTS. The authors would like to thank Owners and Managers, too many to mention by name, for their co-operation in growing so many interesting species in addition to their oilpalms.



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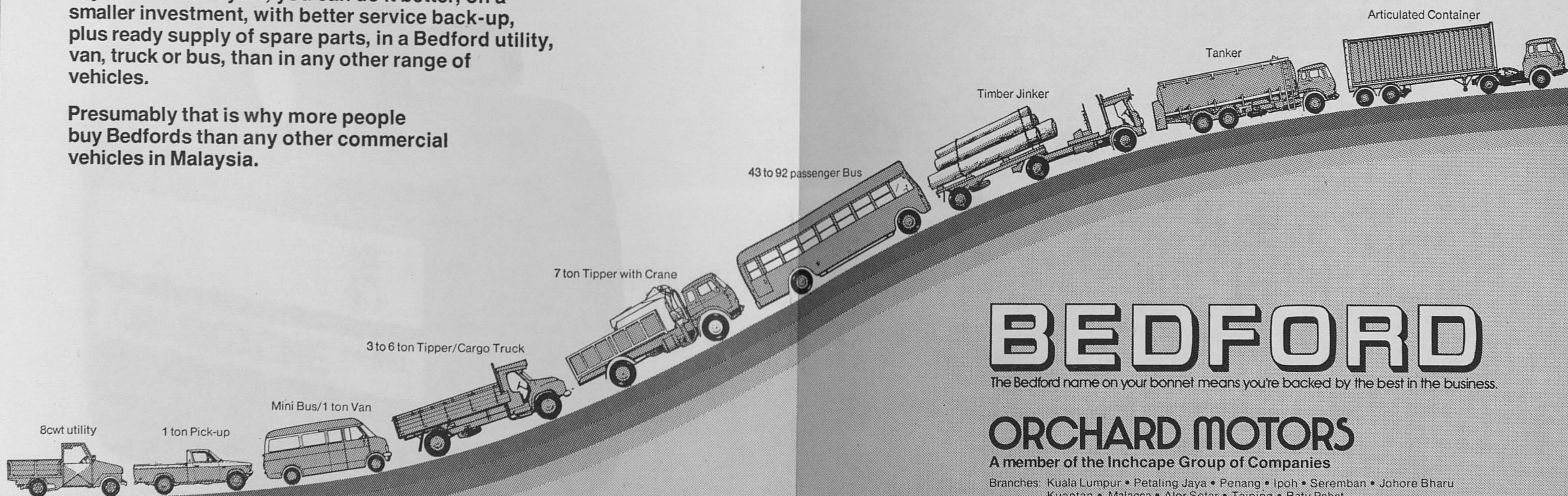


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Specification for civil engineering materials and construction in estate engineering

V. NAVARATNARAJAH*

SUMMARY

Civil engineering construction is sometimes misunderstood as being limited to only major structures such as tall buildings, bridges, highways, dams or harbour construction. The major part of estate engineering is very much related to civil engineering materials and construction. Whilst a specialist engineer may be able to handle a specialized civil engineering construction, it would require a civil engineer with wide experience to be able to cope with the varied nature of civil engineering construction and maintenance works on an estate. Although the magnitude of these works may not be large as on a major civil engineering project, still all the essential elements of a major work exist in estate engineering. Hence it is necessary that those in charge of the execution of such works shall be sufficiently informed of the specifications that have to be met by the materials used on such construction as well as by the finished product. In a country such as Malaysia where a major share of the national income is derived from rubber and oil palm estates spread across the country, a better understanding of the specifications will be well rewarded by the substantial savings that will accrue therefrom.

MAJOR AREAS

The important aspects of civil engineering construction in estate engineering may be classified as related to the construction of buildings, roads, water-supply and public health or sanitary engineering. Since most of the common civil engineering materials are used in these different areas, the specifications relating to the different materials will be discussed separately but attention will be drawn to the necessary and specific quality requirements for their use in a specified area such as in building construction or sanitation engineering. Also, the various construction specifications relevant to estate engineering are discussed together with the material specifications.

BUILDINGS AND BRIDGES

Bricks

This is a common material used in the construction of walls in buildings, piers and abutments in bridges and other structures such as manholes in drainage engineering, by bedding and jointing and mortar in recognized bonding systems. Their material specifications are defined and described in MS 7.6 (BS3921). Bricks are commonly of clay, sand-lime or concrete. In Malaysia, burnt clay bricks are commonly used and hence the present discussion will be confined to them. Clay bricks are of different types, namely common bricks, facing bricks, loadbearing bricks, engineering bricks and bricks of special shape. Loadbearing bricks used in construction work

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are classified according to their compressive strength and water-absorption properties. The latter is not critical for bricks used for internal work. However, when bricks are used for external work, no sample should develop efflorescence worse than moderate when tested as described in the standards.

The strength of bricks even when they come from a single source may vary. An average of the crushing strengths of a number of samples tested according to MS 7.6 (BS3921) may be taken as the representative value. Usually an average of ten bricks tested wet should exceed a strength of 750 lb/in² for strong clay bricks.

Mortar of either cement-sand or cement-lime-sand mix is used in joints of brickwork so that the bricks will be bonded solidly together to form structural elements and the loads will be well distributed in the structural element. Mortars of 1 : 3 cement-sand are very common and the cement used is generally of the ordinary or rapid-hardening portland cement to BS12. The sand used is normally specified to comply with MS 7.5 (BS1200) in all respects and to be well graded. The use of slaked lime in 1 : 1 : 6 cement-lime-sand mortar is sometimes preferred as the presence of lime improves the working qualities of the mortar and reduces its tendency to shrink and crack on drying. Plasticising agents are added to a mortar mix to improve its plasticity and workability as these materials have the ability to entrain small stable air bubbles which in turn improve workability. Harsher sands may be used with such plasticisers and in some instances even the sand content can be increased. For example, a 1 : 1 : 6 cement-lime-sand mix is shown to be replaceable by a 1 : 6 cement-sand-mix with plasticiser.

It is important that water used in the mortar is clean, free of dissolved salts and tested according to MS 7.3 (BS3148) in case of doubt as to its quality. Water containing soluble salts may lead to efflorescence, a common defect of brickwork.

Dampness needs to be eliminated from buildings as it may promote decay or produce unsightly effects such as efflorescence. Rain falling on brickwork can penetrate the body of the brickwork by way of the pores of the bricks and mortar, or by way of cracks in the joints. The long and frequent spells of rain prevailing in this country can cause the brick wall to become saturated before the moisture dries out. Hence it is necessary to select dense bricks of low porosity together with dense mortars for external walls. The most effective protection for brick walls against rain penetration is cement rendering but this should not be richer in cement than is required.

Brickwork may also come into contact with moisture from the ground and foundations, and it is customarily required by building bye-laws to provide a horizontal damp-proof course of impervious construction.

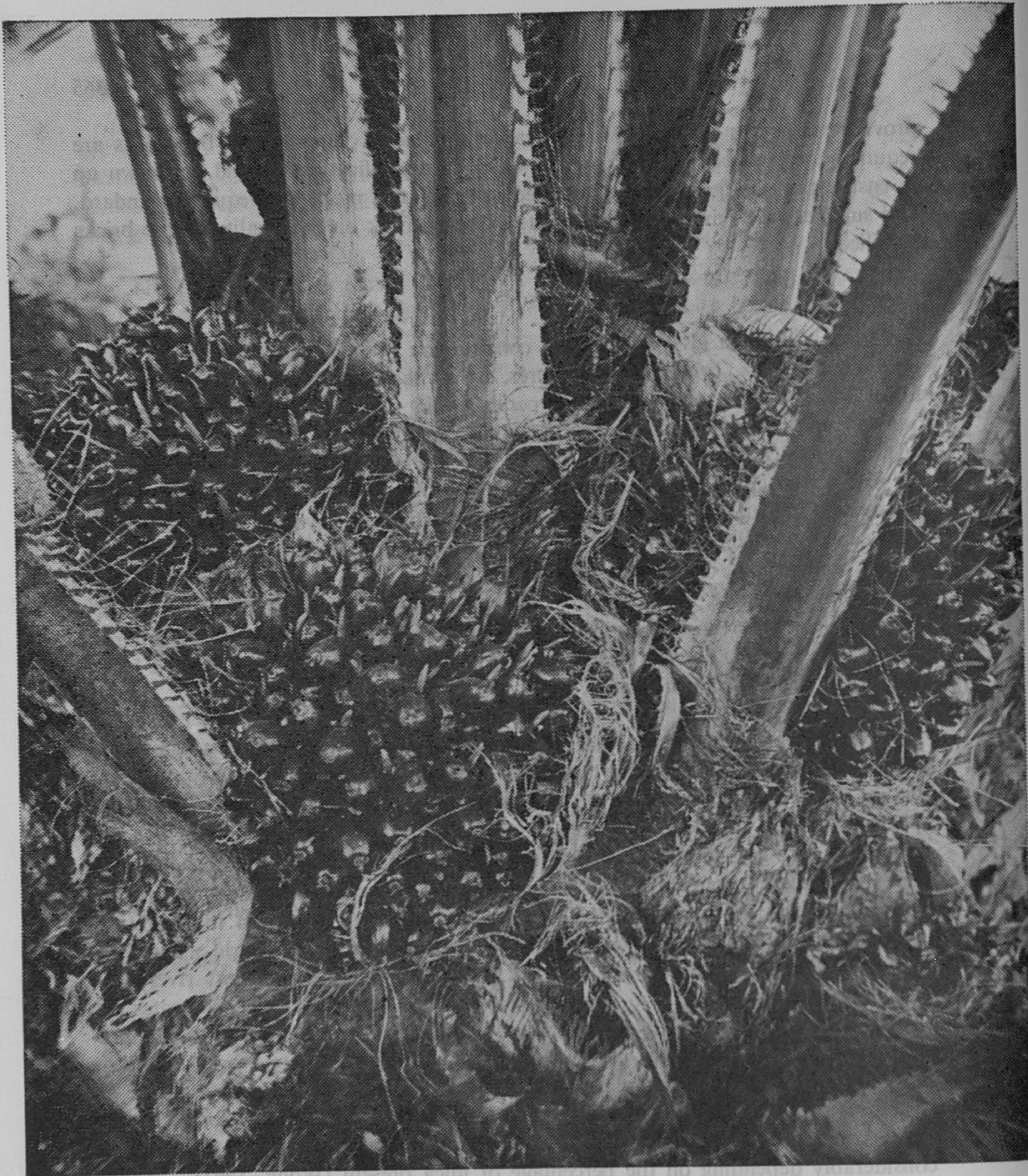
In Malaysia, bricks manufactured locally are of varying quality and it is important that specifications be drawn up according to the needs of the user. For example, the bulk of the bricks manufactured are used as in-filling in walls in buildings in which the structural frame carries the load. In such a situation, the strength of the bricks is not of great importance as they are being used only to

provide privacy or insulation from weather and noise. However, if the bricks are required for load bearing purposes in walls, the specifications should be drawn up to ensure that the quality of bricks used in such walls meets the required standard, and sufficient tests are carried out at the site to check on the quality of the bricks supplied.

Concrete

Concrete is used in civil engineering construction both as mass concrete such as in retaining walls, bridge sub-structures, or as reinforced concrete in almost all forms of structures. Difficulty is experienced in this country in obtaining good quality concrete even on major construction sites due to lack of understanding of making good concrete, especially due to the ignorance of concrete technology by the foreman in charge of construction works. However, better specifications, closer supervision and the introduction of ready-mixed concrete have led to improvements in the quality of concrete produced. Nevertheless, concretors executing works on estates tend to have the impression that there is no need to exercise great care in controlling the quality of concrete, as the quantity of concrete involved is not very large. This is an erroneous impression as buildings on estates are no different from those in other areas, nor are bridges and culverts on estate roads carrying less heavy loads than the ordinary highways.

Concrete is normally produced at the site to the specification prepared by the design engineer and hence the quality of concrete produced will depend on the quality of the specification and the degree of control exercised in ensuring that the specifications are satisfied. Concrete is usually made from cement, coarse and fine aggregates with a required amount of water sufficient to hydrate the cement which serves to bind the aggregates together and form a strong solid mass on hardening. Cement is being produced locally to the requirements of BS12 and the quality is comparable to cement produced in other parts of the developed world. The common coarse aggregates used are crushed granite or limestone whereas river sand or mining sand constitute the fine aggregate. The coarse and fine aggregates are required to comply with MS 7.4 (BS882, 1201). Although crushed granite is preferred for making concrete, particularly in reinforced concrete work, limestone produces equally strong concrete (Navaratnarajah, 1971) and may be used for all structures excluding water-retaining structures. River sand available locally sometimes contain mica particles which could reduce the strength of the concrete considerably depending on the percentage of mica present (Wong, 1961). Mining sand on the other hand has been found to yield concrete of acceptable strength provided it is of the approved grading and does not contain too many fine particles. The strength of concrete decreases with increase in the water-cement ratio. Hence increase in the percentage of fines would require more water to produce a concrete of sufficient workability which in turn would lead to a reduction in the strength of concrete. The water used for mixing concrete should be clean, free from dissolved salts and complying with the requirements of MS 7.3 (BS3148). The constituents of a concrete mix should preferably be weigh batched and mixed in a concrete mixer in order to obtain a homogenous mix. The concrete produced should be of sufficient consistency so that it may be compacted easily in the forms. The consistency may



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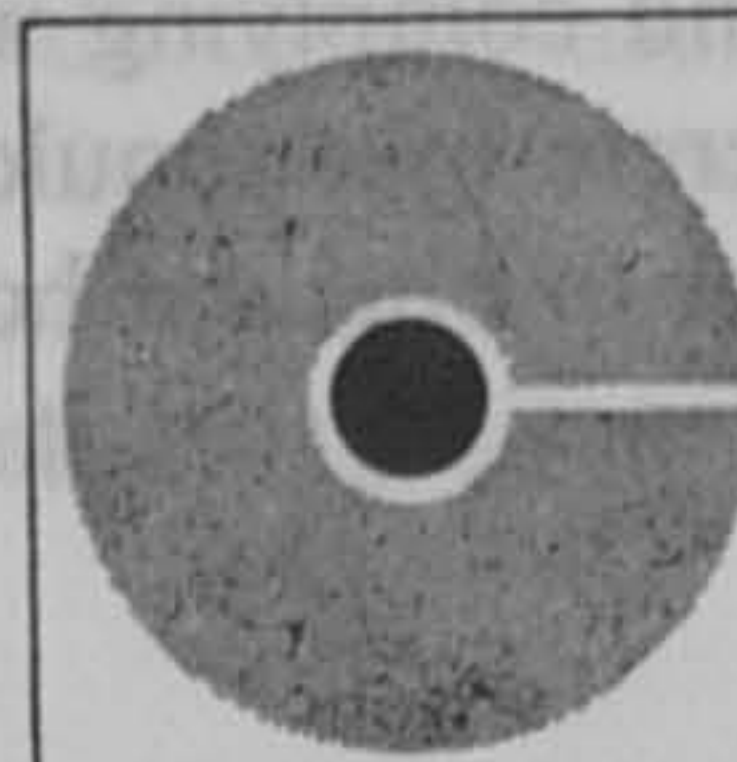
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be tested according to the slump or compaction factor tests as specified in MS 7.1 : 1971 (BS1881 : 1970). Mechanical vibration is very often used to compact concrete of low water : cement ratios. The concrete produced should meet the requirements of the specifications in regards to strength, tested as specified in MS 7.1 Part 4 (BS1881 : Part 4). This is usually done by testing cubes of the hardened concrete prepared in a specified manner and under a controlled rate of loading at a specified age of the concrete such as 28 days.

There are two types of specification for concrete as given in Codes of Practice (CP) 110. One type specifies the proportion of constituents so that concrete mixed and produced in the given proportion would yield the required strength that would meet the design requirements. The second type specifies the required strength so that the builder or contractor may design and produce a suitable mix that will meet the approval of the supervising engineer. The first type is the one suitable for concreting works on a small scale such as that produced on estate construction jobs. However, it must be emphasized that even the best specifications will not produce good quality concrete if proper control is not maintained by the contractor or the engineer supervising the work.

The design of reinforced concrete is based largely on Codes of Practice such as CP114 or the new CP110 for normal reinforced concrete and CP2007 for water retaining structures. The concrete used in reinforced concrete is designed and manufactured in the same manner as for unreinforced work and the specifications relating to this have already been discussed. The other constituent material of reinforced concrete is the steel reinforcement. These are either plain round mild steel bars or deformed high-yield-stress bars. Sometimes fabric reinforcement consisting of steel wire mesh is also used in structural elements such as slabs or walls. Reinforcement steel should meet the requirements of the relevant standards such as BS4449 for mild steel bars and hot-rolled deformed bars, BS4461 for cold-worked bars and BS4483 for fabric reinforcement. Generally the reinforcement steel must be of good condition and of a quality that would meet the strength, ductility and toughness requirements specified in the standards. The specifications require that samples of the steel be periodically tested to ensure that the steel is of the required quality.

Timber

Timber is very commonly used in estate construction primarily because it is readily available and is very economical. It is sometimes not very efficiently used, as sufficient care is not taken to obtain timber that is well seasoned or treated against attack by insects and the environment. The instability of a piece of timber is caused chiefly by the removal of water in the many tiny cells of which it is composed. This drying out process is called "seasoning". In drying, a piece of wood under constant conditions of temperature and relative humidity dries to a moisture content level where it neither gains or loses water from or to the atmosphere and at the point of balance the moisture in the wood is called the "equilibrium moisture content". At this moisture content timber is said to be fully seasoned for that particular environment. Hence timber should be seasoned to the average equilibrium moisture content for the location in which it is to be used. If the wood so seasoned

is used in a drier atmosphere it will further lose water and cause shrinkage. In order to avoid such eventualities, it is common practice nowadays to kiln dry the timber so that the defects of air dried timber are either completely eliminated or greatly reduced. Kiln drying also prevents attacks from fungus and wood boring insects and helps to harden resins present in pockets in certain timber species. Lyctus beetles and their eggs and larvae are easily killed when subjected to temperatures of 60°C or more. Hence, specifications for timber, particularly those for joinery work should include a clause requiring the fabricated timber to be of an appropriate moisture content such as given in BS1186 : Part 1.

Although normal kiln drying schedules automatically give complete sterilization of the timber, this treatment does not prevent future infestation by insects. This is overcome by impregnation of the wood with preservatives such as copper/chrome/arsenate salts depending on the specific requirements. They afford complete protection against all forms of termite, insect, decay and marine borer attack and are usually impregnated by the vacuum/pressure process. There are other non-pressure methods of protection such as brushing, spraying or steeping but these offer only a short term protection of a temporary nature. CP98 gives a full description of preservative treatment for constructional timber.

Good specifications require that the timber used in civil engineering work meets the requirements of CP112 as regards quality, grade and strength, properly seasoned or kiln dried and suitably protected against factors that may damage or destroy it. The strength properties of Malaysian timbers are available from the Forest Department (Lee & Chu, 1965) and in the Singapore Code of Practice for Timber. There is no reason why good quality timber sufficiently protected should not be used for building timber houses or even timber decking for road bridges.

Timber is extensively used in buildings, essentially for roofing and making doors and windows. However, metal frames for doors and windows are becoming easily available and hence are being increasingly used. Nevertheless, timber is still very commonly used in roof trusses. These are sometimes available as pre-fabricated trusses under different proprietary systems, one such example being the Gang Nail Truss System. One of the advantages of such pre-fabricated timber trusses besides the ease and rapidity of erection is the indirect guarantee of seasoned timber as such jointing systems need sufficiently seasoned timber to be efficient.

Roofing materials

Tiles, asbestos and metal decking are some of the materials used locally for roofing. Tiles require a steep roof slope and a rather heavy timber framework of purlins and rafters. Hence asbestos and metal decking are preferred for most semi-permanent type of buildings and factory buildings and tiles for residences. More recently very light types of proprietary forms of steel decking which may be laid to very small slopes and of a decorative nature have replaced asbestos as roofing material.

Asbestos-cement sheets for use as roof coverings exist in a wide variety and there should be no difficulty in adapting them to any situation. The pitch of the roofs should normally be kept at a minimum of 22½°, the end laps being the critical

point. If sheets of length up to 15 ft are used and if horizontal laps are thus avoided, pitches down to 5° are possible. They are easily fixed to either timber or steel purlins, but purlin spacings should be arranged to accommodate sheets of standard size to avoid cutting and wastage. End laps are usually 6 in. in normal pitches and side laps depend upon the sheeting. However, side laps should be arranged to face away from the prevailing wind.

The type of roofing material used, the span of the roof and the spacing of supporting members such as columns decide the type of roof structure. Asbestos roofing is very commonly used with steel roof trusses combined with either timber or steel purlins. Metal decking is used with either timber or steel roof trusses. Steel roof trusses have the advantage that they are very durable and can be erected very fast, as they can be pre-fabricated at a factory under controlled conditions. All such steel trusses shall be fabricated according to BS449 and either bolted or welded. In view of the poor quality of site welding obtained at construction sites locally, it is recommended that all site connections be done with black or turned and fitted bolts as per BS449 or with high-strength friction grip bolts as in BS3294. The latter are only recommended where the load transferred is large; black bolts or turned and fitted bolts would meet the normal situations in estate engineering adequately. All steel construction shall be adequately protected against corrosion as described in CP2008. A common method of protection is painting, the subject of another paper at this conference.*

WATER SUPPLY

An estate may draw its water requirements either from a supply already available or obtain its own supply from streams, lakes or shallow wells. Where a well is required, samples of the water supply should be taken with the proper apparatus, analysed and reported upon by a competent analyst. In a shallow well, the water level is not deeper than 25 ft below the surface and can therefore be worked by a suction lift pump fixed at ground level. Deeper wells are beyond the range of a normal suction lift pump and in such cases reciprocating force pumps can be used. However, before wells are dug or bored, allowance must be made for test pumping to prove yield and to clean and open the water-bearing fissures in them.

Waters drawn from streams, rivers, lakes and wells require treatment in addition to removing hardness present in them. Hardness in water is due to the presence of dissolved calcium and magnesium salts and these salts are the cause of scales and furring found in pipes and boilers and also in kitchen utensils. At the present time, it is generally held that all water containing more than 14 grains of calcium or magnesium bicarbonate per gallon (14 degrees of hardness or 200 ppm) should be softened for domestic use. The two standard forms of water softening are by precipitation softening (lime soda) or base exchange softening. The advantages of the base exchange method are compactness, no chemical except common salt is used, ease of access and maintenance, no sludge has to be removed, only the exhausted brine is run into the drain and adequate pressure is maintained. The process

* ISP Conference on Estate Engineering & Mechanization, 1975.

automatically compensates for varying hardness of the hard water supply so that a perfectly soft, treated water is obtained up to the capacity of the plant. Water of zero hardness is always obtained from this type of plant. However, it is not always necessary to maintain the water at zero hardness and waterworks generally aim at producing a water of 5–7 degrees of hardness (80–100 ppm). In selecting a plant, the apparatus shall be soundly constructed and charged with the most efficient type of base exchange material.

Supplies of water obtained from streams, lakes and shallow wells require treatment against potential disease-producing organisms, neutralization to prevent corrosion, clarification to remove suspended mineral and organic matter, and decolorization to remove peaty and organic colouring matter. Many natural waters are slightly acidic due to the presence of a high content of free carbon dioxide and this acidity can cause corrosion. The pH value, which is a measure of active alkalinity or acidity must be raised, in the case of soft water to about pH 8.0 or for a hard water to a pH of 7.2–7.6. The pH value of such water containing large amounts of free carbon dioxide can be increased by aeration, either by cascading or by forcing through nozzles.

Addition of salts such as aluminium sulphate helps to remove the large amounts of suspended matter and thus clear turbid waters. Chlorine may be added to water in many ways, but very commonly as chlorine solution to sterilize the water to be treated. The amount of chlorine solution added varies from 0.2 ppm for deep well water to 0.8 ppm or more for river water. It is usual to add sufficient chlorine to ensure that there is a slight residual quantity of chlorine in the water after the normal chlorine demand has been specified. The normal residual quantity of chlorine is 0.1 to 0.2 ppm and cannot normally be tasted.

Storage of water should be decided after examination of the rate and regularity of the supply. It is usual to provide at least a storage capacity of 50 gal per dwelling. CP310 provides guidance on storage requirements for various types of buildings and occupancies and these must be considered in providing a cistern capacity. BS417 gives details of the sizes and positions of all connections to cisterns. Storage cisterns are usually of galvanized pressed steel but recently fibre-reinforced plastic containers or fibre-glass cisterns have been very commonly used. The requirements of galvanized steel cisterns are specified in BS417.

SANITARY ENGINEERING

This comprises essentially drainage of foul water or surface water and unless there are special circumstances, it is usual to convey foul water and surface water in separate drains and sewers. The foul water may be from water closets, waste or trade effluent and the surface water is usually run-off of natural water from the ground surface including paved areas, roofs and unpaved land. In Malaysia, waste water from kitchens and baths is also directed into surface drains. Drainage works and design are subject to compliance with numerous regulations, ranging from Local Building Bye-laws, Acts of Parliament such as the Public Health Act or the Land Drainage Act.

The basic principle to be followed in designing and executing drainage works is that to be efficient it should be self-cleansing and function with a minimum of maintenance whilst collecting foul and rain water discharge in a suitable manner and condition to sewers or other outfalls without nuisance or danger to health. Reference should be made to the local authority for the areas concerned to ascertain their general requirements and to ensure that the proposals will comply with their bye-laws, particularly when connection is to be made to a public sewer or drainage system. Most authorities require all drainage to be separate systems with all rain water excluded from foul water drainage and collected in separate drains. In certain areas a combined system may be allowed. For example, the drainage in the Central Area of London is largely a combined system. One of the reasons for the separation of the foul and rain waters is to provide the fullest economy in providing foul water sewers. In a country like Malaysia where rainfall is rather heavy, a drainage system to serve a combined flow of foul and rain water would need to be much larger and therefore more costly.

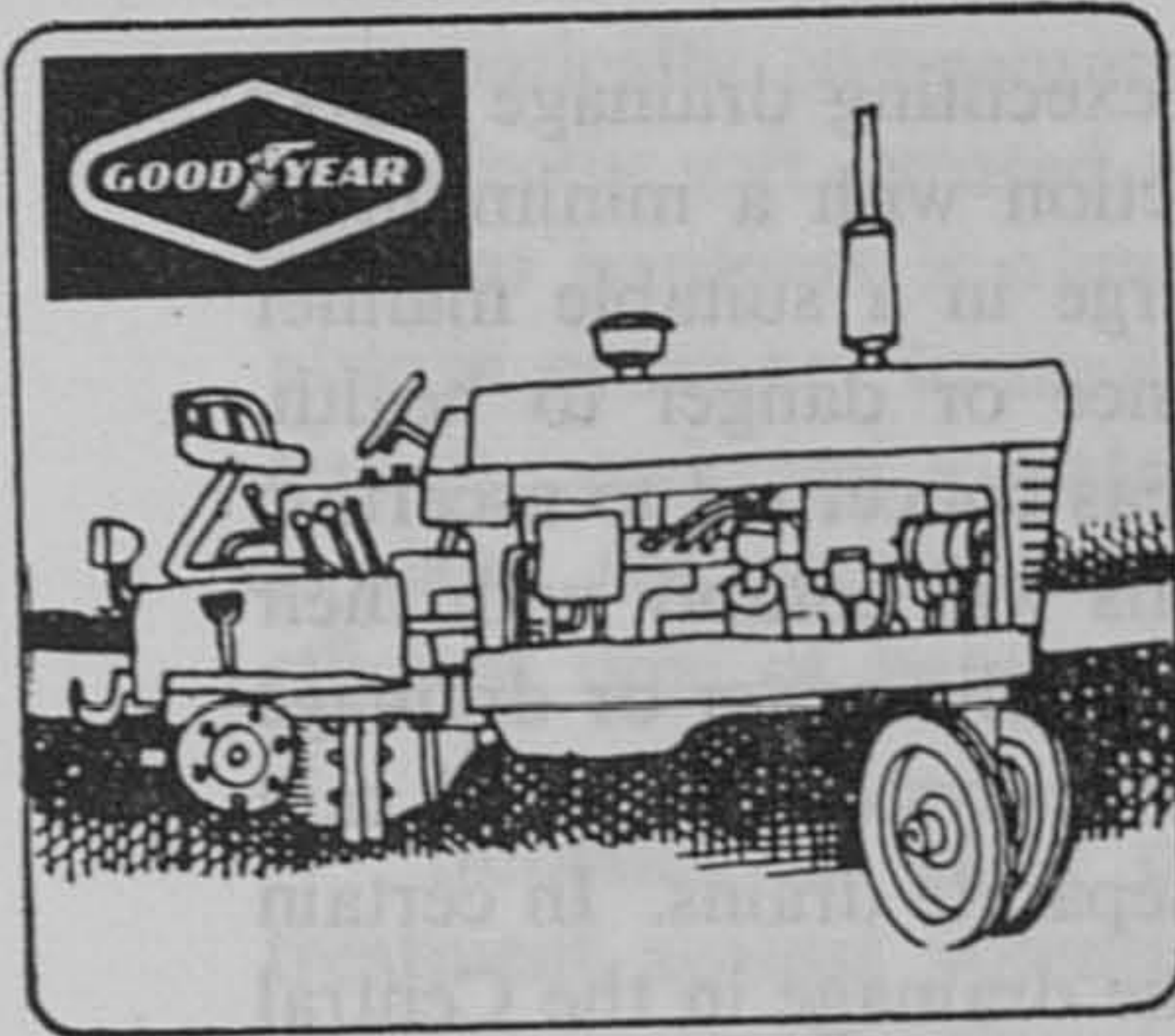
The design of drainage systems is best left to specialists. However, drains for conveying foul water can be sized by taking the total water usage by the building occupants as a basis. For example, in dwelling houses and flats CP310 allows 20 gal per resident per 20-h day. The size of a drain would depend on the amount of discharge and the available gradient.

Materials used for drainage works should comply with CP301 which lays down clear standards for drain laying materials. Usually foul water drains are of glazed-ware or cast iron pipes laid to suitable gradients on a concrete quarter-haunched bed. The pipes are required to be surrounded with concrete if they are laid under buildings or are very close to the ground surface. The system is provided with manholes or inspection chambers which are built with brick in cement mortar 1 : 3 and the chambers may need waterproofing externally to prevent infiltration of sub-soil water where a high water table is evident. Chambers should be founded on a 6 in.-thick concrete base and built to the specifications detailed in BS556.

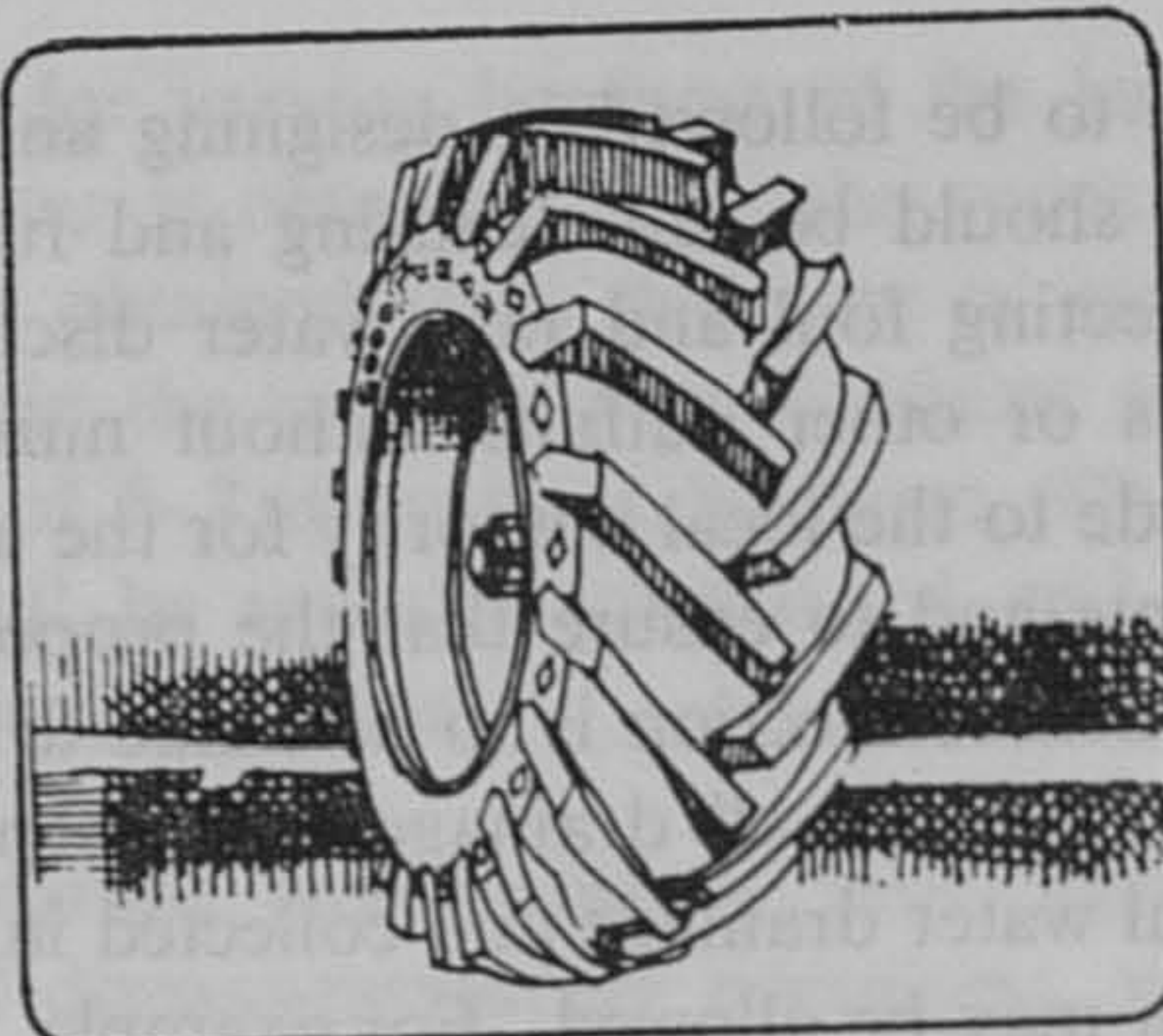
Sewage from residential buildings and factories may be either treated or discharged raw into streams. The Royal Commission on Sewage Disposal in England allows that under certain restricted conditions, crude sewage may be discharged into a stream of sufficient size to dilute it by five hundred volumes. Generally, such a degree of dilution is not obtainable in rivers and streams and hence sewage should be first treated and the effluent discharged into streams or rivers, provided that the effluent does not contain more than 3 parts per 100 000 of suspended solid and does not absorb more than 2 parts per 100 000 of dissolved oxygen in 5 days.

The basis of all sewage treatment is to render the effluent acceptable to the specified standards. This is generally achieved by the process of screening, sedimentation, digestion by anaerobic bacteria followed by filtration and further aeration by aerobic bacteria. Sewage treatment for isolated dwellings or a group of buildings may be carried out in a small treatment unit constructed locally close to the buildings.

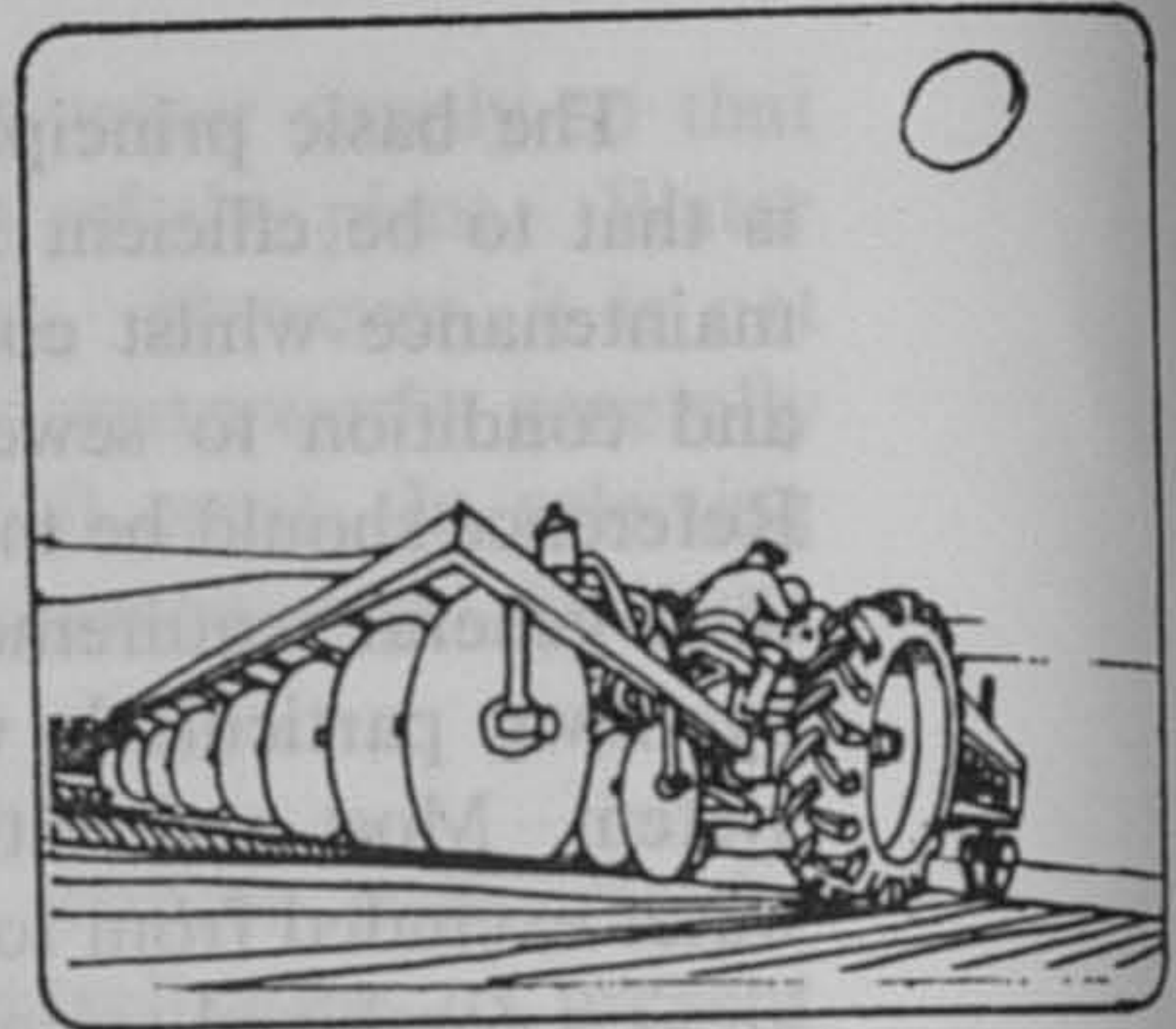
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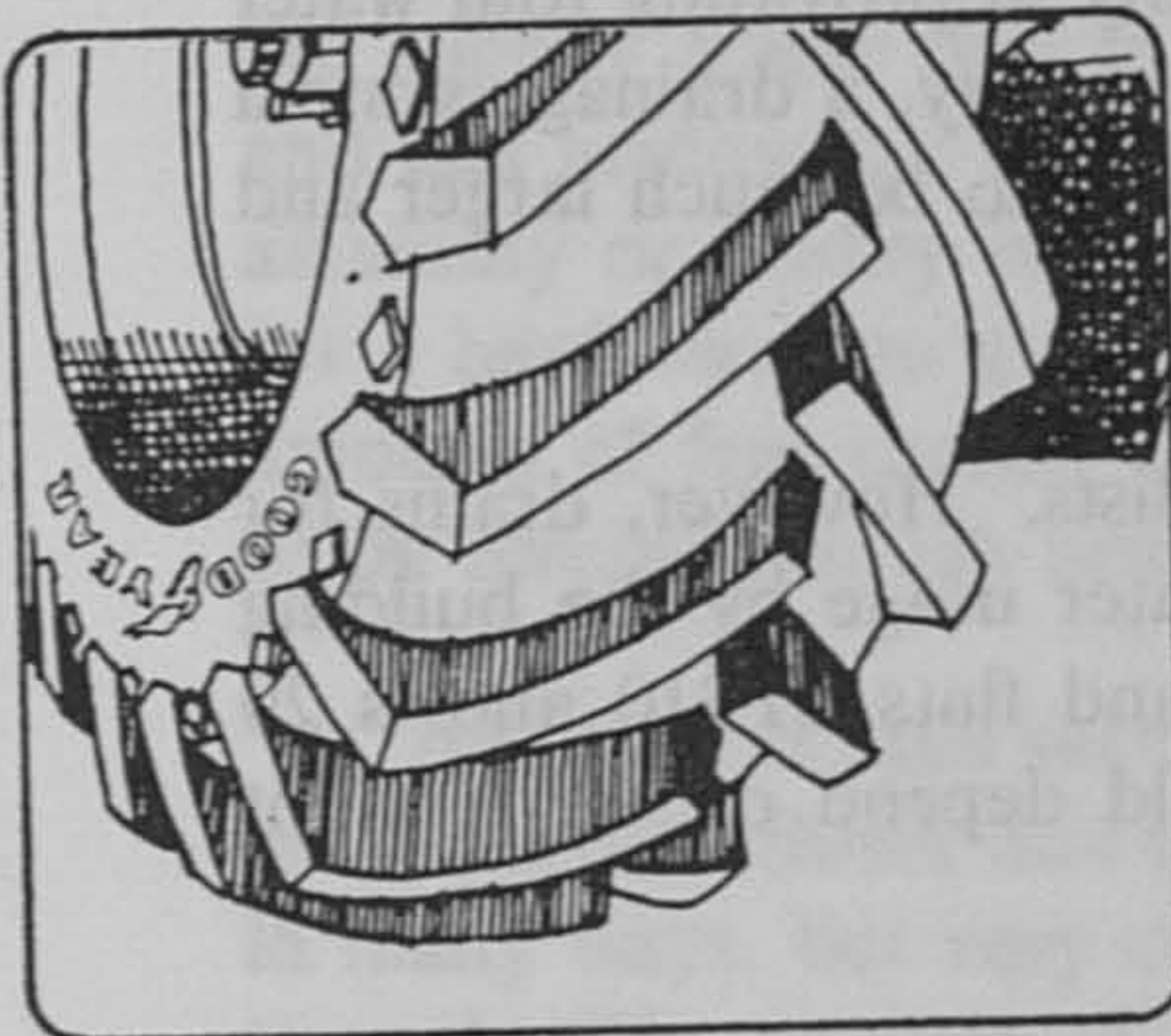
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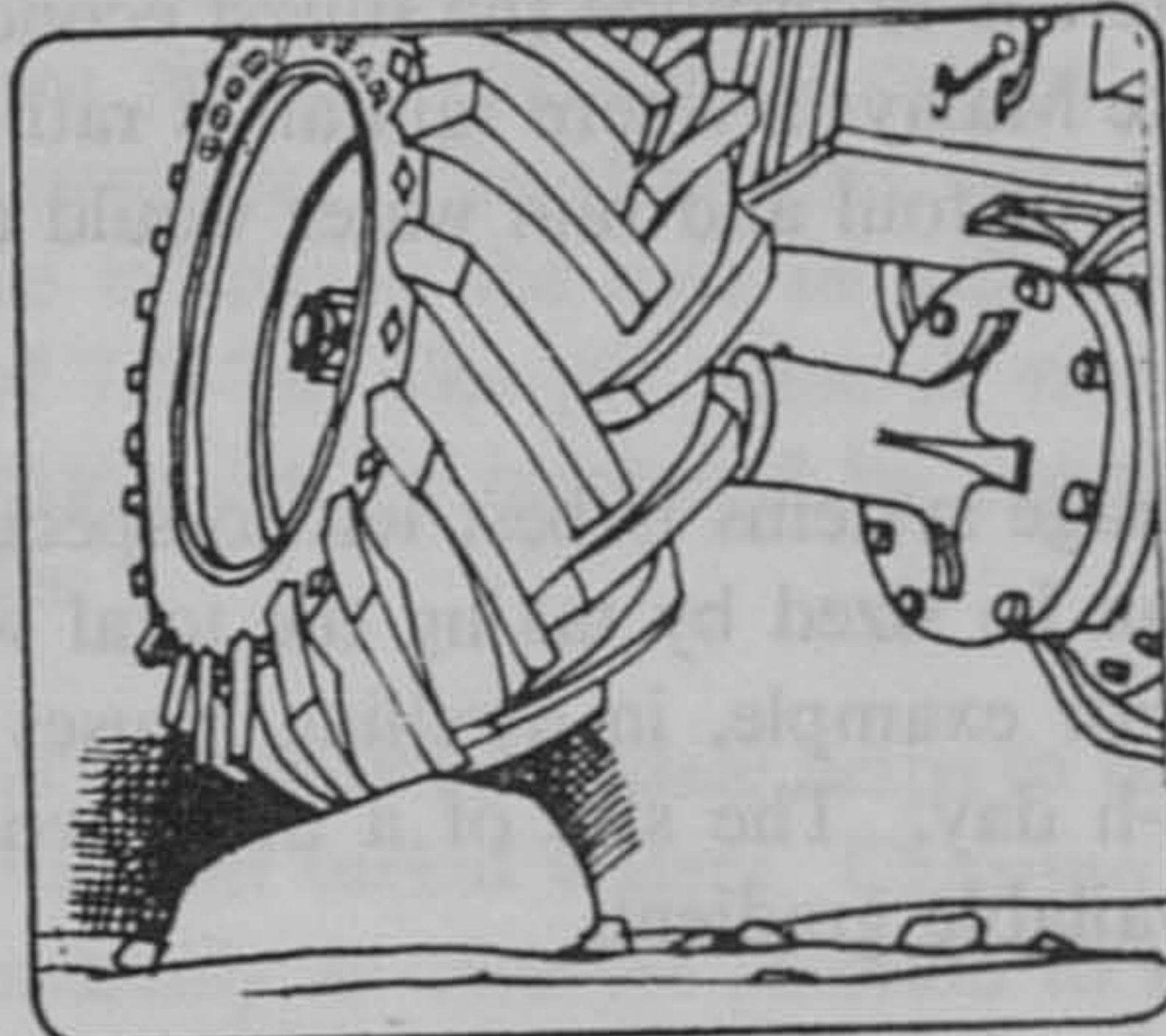
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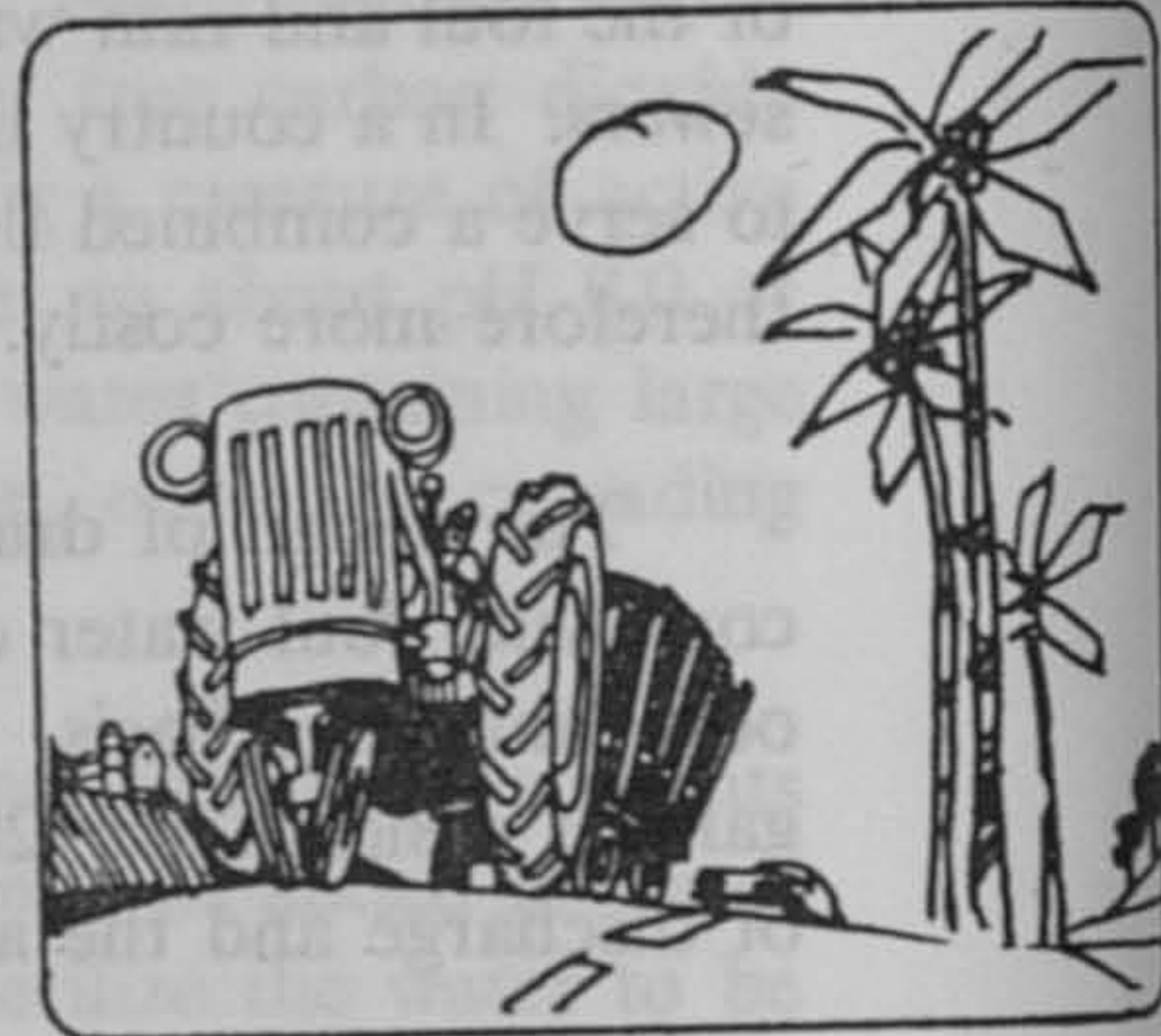
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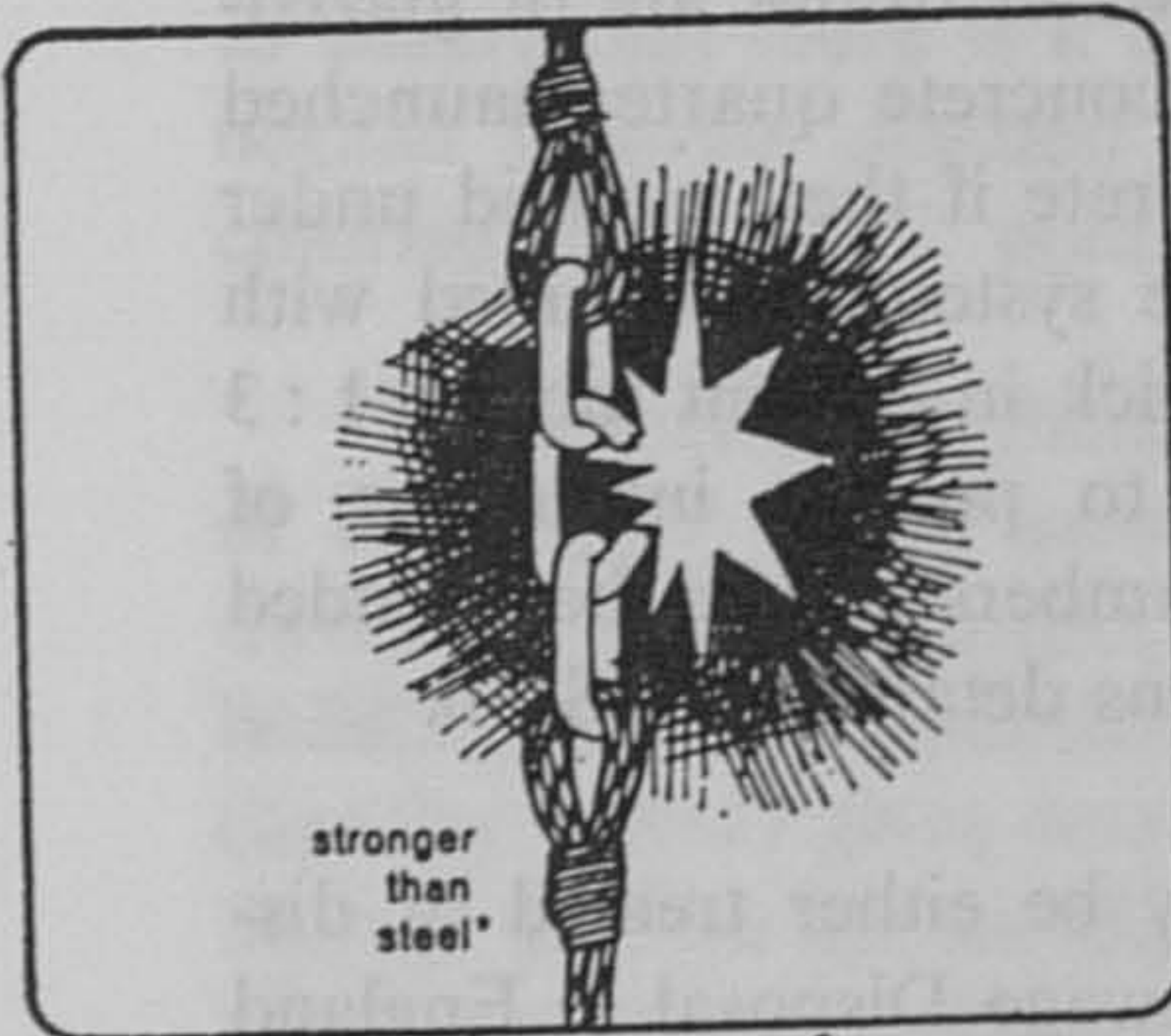
Reason: wedge-grip action.



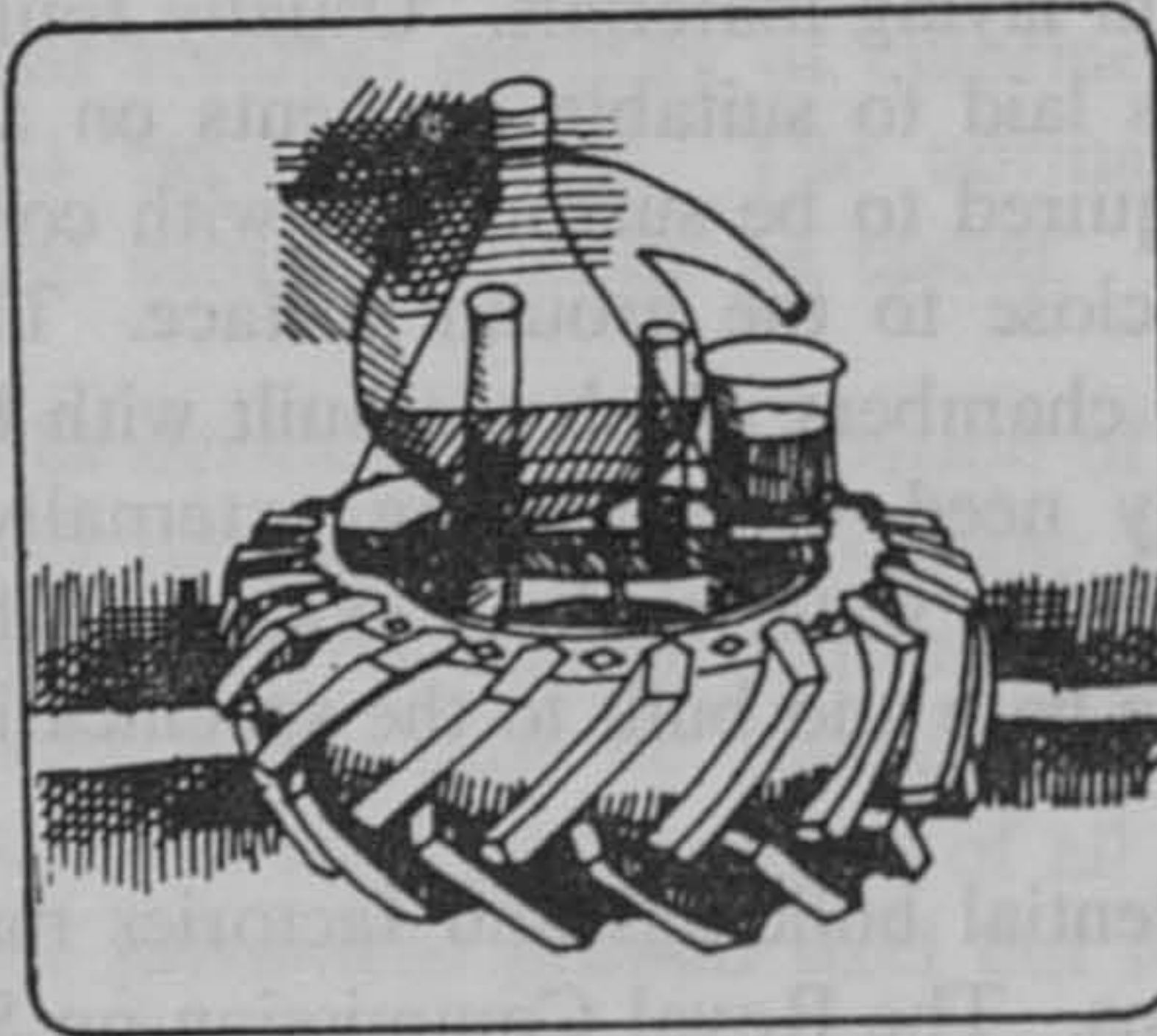
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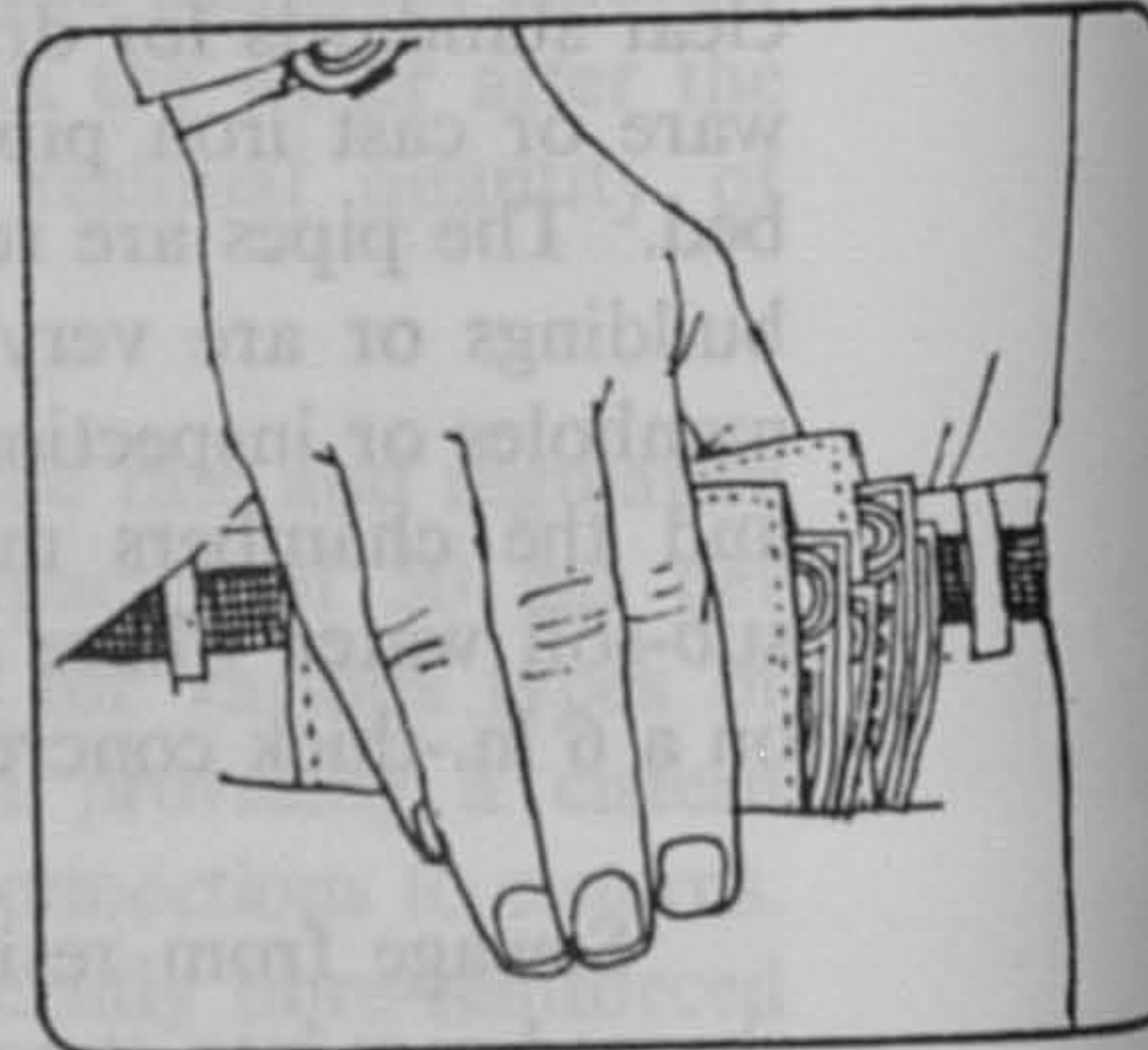
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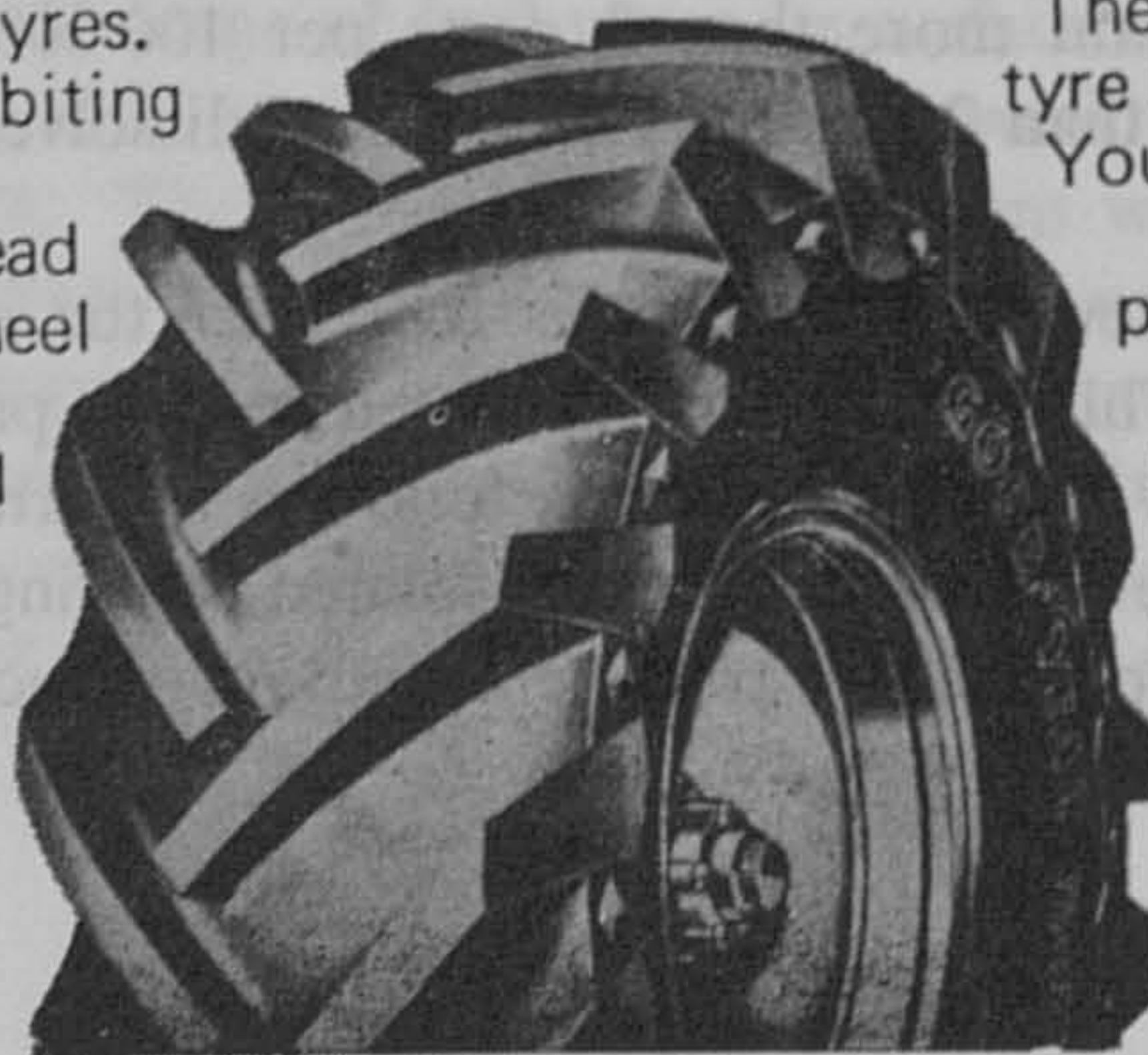
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FUTURE PROSPECTS

It is evident from the foregoing discussion that estate engineering entails different aspects of civil engineering works, each of them of a specialized nature and of scope different from major works only in the size or extent. They need attention to specification and control as close as on larger works. Unfortunately, in view of the limited budget for such projects, they are not attractive to builders and contractors who have the necessary organization and know-how to execute the works to the required specifications and quality. As a result, such works are undertaken by builders and contractors who have limited know-how or lack the supporting facilities to carry out the works satisfactorily. Although individual projects on an estate may not be financially attractive, provided most of the civil engineering works related to estate engineering and the relevant specifications are standardized, it should be possible for an enterprising builder or contractor to manufacture pre-fabricated components to meet the required standards and specifications. Hence, it seems that two steps need to be taken in order to promote good quality in estate engineering, namely:

- (i) a standardization of civil engineering works and specifications related to estate engineering;
- (ii) a concerted effort to manufacture pre-fabricated components which may be readily used on estates.

A standardization of civil engineering works on estates is possible as the need on all estates is common and the type of civil engineering work is the same except that there might be differences specific to the locality where the estate is sited or due to certain specific needs. These special difficulties can always be overcome with advice sought from specialized consultants. Once standardization is accepted, it is possible to draw standard specifications for most of the areas in estate engineering with the necessary adjustments for the special circumstances referred to earlier. This would help builders and contractors in the speedy execution of the works, as familiarity with the specifications helps them to execute their work more efficiently resulting in savings to estate owners. Familiarity of the specifications by the contractor also eases the task of the officer supervising such engineering works.

The services of a builder or contractor are needed even with standardized specifications, as skilled labour will still be required to execute the works to the specifications. It is becoming increasingly difficult with the numerous development

works in this country to obtain skilled labour to be employed on smaller works such as those on an estate. Hence, a method of obtaining satisfactory quality of work under such circumstances would be to use manufactured pre-fabricated components of controlled quality and assemble them using unskilled or semi-skilled labour which is always available on estates. An enterprising contractor could manufacture the common items that are frequently used in engineering works on estates and make them available to estate management in the same manner as proprietary brands of wash basins, baths or toilets are available in the open market. It is understood that before such items or components can be manufactured, they should be standardized in a form and shape acceptable to the estate management and community. Some examples of items that may be pre-fabricated are timber trusses, timber houses, precast concrete posts, beams and foundations, precast floor slabs, drains and septic tanks. Once the economic advantages of such pre-fabricated components are realised and skilled labour becomes increasingly costly and scarce, not only estate managers but even housing developers may turn to the use of pre-fabricated components.

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Methods of Testing Concrete for Strength
5. MS 7.1 : Part 5 — Methods of Testing Concrete Part 5:
Methods of Testing Hardened Concrete for other
than Strength
6. MS 7.2 : 1971 — Precast Concrete
7. MS 7.3 : 1971 — Tests for Water for Making Concrete
8. MS 7.4 : 1971 — Coarse and Fine Aggregates from Natural Source
9. MS 7.5 : 1971 — Methods for Sampling and Testing of Mineral
Aggregates (Sands and Fillers)
10. MS 7.6 : 1972 — Bricks and Blocks of Fired Brickearth or Shale

Singapore

1. CP1 : 1966 — Code of Practice for the Use of Timber in Building Construction

United Kingdom

1. BS12 : Part 2 : 1971 — Portland cement (ordinary and rapid-hardening)
2. BS417 : Part 2 : 1973 — Galvanized mild steel cisterns and covers, tanks and cylinders
3. BS449 : Part 2 : 1969 — The use of structural steel in building
4. BS556 : Part 2 : 1972 — Concrete cylindrical pipes and fittings including man-holes, inspection chambers and street gullies.
5. BS882, 1201 : 1965 — Aggregates from natural sources for concrete
6. BS1186 : Part 1 : 1971 — Quality of timber and workmanship in joinery
7. BS1198-1200 : 1955 — Building sands from natural sources
8. BS1438 : 1971 — Media for biological percolating filters
9. BS1881 : 1970 — Methods of testing concrete
10. BS3148 : 1959 — Tests for water for making concrete
11. BS3294 : Part 1 : 1960 — The use of high strength friction grip bolts in structural steelwork
12. BS3921 : 1974 — Clay bricks and blocks
13. BS4449 : 1969 — Hot rolled steel bars for the reinforcement of concrete
14. BS4461 : 1969 — Cold worked steel bars for the reinforcement of concrete
15. BS4483 : 1969 — Steel fabric for the reinforcement of concrete
16. CP98 : 1964 — Preservative treatment for constructional timber
17. CP110 : 1972 — The structural use of concrete
18. CP112 : 1971 — The structural use of timber
19. CP114 : 1969 — Structural use of reinforced concrete in buildings
20. CP301 : 1971 — Building drainage
21. CP310 : 1965 — Water supply
22. CP2007 : 1970 — Design and construction of reinforced and pre-stressed concrete structure for the storage of water and other aqueous liquids
23. CP2008 : 1966 — Protection of iron and steel structures from corrosion



Eureka FLUID FILM

The perfect answer to control corrosion in agriculture.

Once in place, Eureka FLUID FILM stays put. A continuous soft, non-drying barrier against metal deterioration.

WHAT DOES EUREKA FLUID FILM DO?

FLUID FILM stops rust

FLUID FILM was perfected to stop the highly corrosive action of fertilisers, herbicides and pesticides on steel surfaces. It penetrates down to the base metal where it sets up an unyielding barrier against the destructive effects of chemicals and gases. FLUID FILM actively displaces moisture and preferentially wets metal.

Effective lasting action

One coat of FLUID FILM gives long lasting control, with minimum maintenance.

Big savings in application time, too!

Surface preparation on new surface is not necessary. Apply directly over adhering mill scale or rust. No sandblasting, and no drying time are required. On heavily corroded surfaces, you only need remove loose rust.

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Eureka FLUID FILM does not affect fertiliser in any way. No clogging. No caking.

WHERE TO USE FLUID FILM

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2. Hot liquid mixing tanks — exterior.
3. Fertiliser pumps, chains, bearings.
4. Structural member and pipe interiors with corrosive gas or fume environment.
5. Spare parts and small tools.
6. Structural member and pipe interiors with corrosive gas or fume environment, including salt air.
7. Mechanical equipment — including fertiliser spreaders, bin slides, drills and general agricultural equipment.

HOW TO CONTROL PUMP CORROSION — WITH EUREKA FLUID FILM

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Liquid (A): Use for dip tank, roller, floatation or spray application.

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Eureka FLUID FILM is available in aerosol cans, 5 gallon pails, and 55 gallon drums.

A product of the Eureka Chemical Company, San Francisco, USA.



NEW FLUID FILM Penetrant-Lubricant

16 oz. Spray Can

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Planter, Kuala Lumpur 52: 374-377 (1976)

Quality painting means better protection plus decoration

J. R. KERR*

SUMMARY

To obtain the best protective effect from painting, each stage must be carried out comprehensively. The surface must be thoroughly cleaned. The correct system must be selected for the substrate. Good quality paint must be applied in the correct manner and the dried surface allowed to mature before exposure. If each stage is followed conscientiously, then the best protection with the added bonus of attractive decoration will be achieved and in the long term the cost will be lowest.

INTRODUCTION

If the average person is asked why it is necessary to paint, the reply would be 'it makes it look nice' or 'for a nice colour'. Very few people would answer 'to give a surface good protection'. Conditions of nature such as wind, rain and sun can be very damaging on surfaces which are not protected. It is necessary therefore to ensure that any man-made surface exposed to environmental conditions is capable of withstanding degradative attack. Paint is applied to a surface to protect that particular surface against environmental conditions and if possible give an attractive appearance. Similarly, the human being, on experiencing bad weather, protects himself with a coat which assists in keeping him dry and clean. Initially, the coat can be cleaned and washed but when it becomes old it is removed and replaced by a new coat. Similarly, a coat of paint if applied correctly can be cleaned but on ageing, it must be replaced by a new coat.

TYPES OF SURFACE

Paint can be applied to many different types of surface where it is necessary to give a particular surface some protection but various factors have to be taken into account. Different surfaces react to climatic conditions in various ways because they are structured differently and hence decay or chemically corrode in different ways. In the paint industry, it is usual to call the surface a *substrate*. Broadly speaking substrates can be split into four main categories, namely wood, plaster, concrete and metal. It is useful to know how these surfaces can be affected if unprotected.

Wood is a cellular material in which 90-95% of the cells are aligned vertically giving rise to the characteristic grain of timber. The other cells lie in horizontal bands known as rays. There are two main categories of wood which are well known—soft woods and hard woods. Wood has been used as a very convenient building material for a long time. This was initiated by its general availability which eliminated transport problems. However, wood comes from a tree which requires water to grow and the moisture content creates a problem for possible painting. It is necessary before painting to dry the wood, so decreasing the moisture content to 15-18% for exterior wood work and 10-12% for interior wood work.

* ICI Paints (Malaysia) Sdn Bhd.

The majority of woods, if unprotected are susceptible to the external influence of water, sunlight, micro-organisms and decay. Water penetrates the end grain of wood easily and if the moisture content increases to above 22%, wet rot can start. The ultra violet of sunlight will cause loss of colour and degradation of the surface because the wood has been stripped of its natural protection of bark. Surface moulds and blue-stain fungi, are objectionable in appearance and may disfigure paintwork, but they have little effect on the strength or durability of timbers.

Very common substrates for painting are plaster and concrete. The substrates can vary in degree of alkalinity according to the type of cement or plaster used, and it is very necessary to ensure that the new plastered surface is given adequate time to dry out; it should also be treated with an alkaline resisting primer. Although it is slightly more unusual to paint concrete surfaces, fully matured surfaces are sometimes painted. The risk of the paint film being affected is not so great provided the correct preparation is followed.

Everyone is familiar with the devastating effect corrosion can have on metals. Corrosion is an electrochemical process which for initiation requires three basic ingredients: moisture or electrolyte, oxygen and the metal itself. By painting, the damaging effects of moisture and oxygen can be delayed. The more thorough the preparation and the greater the film thickness of paint the better the protection against corrosion. More valuable metals like gold, silver, platinum would have greater resistance to normal corrosive influences but buildings would become excessively expensive. Metals can be arranged in decreasing order of electronegativity and the table formed is the well known electromotive force series. The larger potential difference between zinc and steel than between aluminium and steel explains why zinc is a preferred protection giving a centre of preferential attack. Galvanized sheet is used as a light building material for low cost roofing. A popularly held misconception is that galvanized sheet does not require any further protection. This is true for the short term but as the galvanized sheet is thin steel sheet coated with a thin film of zinc, corrosion of the steel will start when the thin zinc layer has been eaten away by corrosive influences.

Any type of substrate requiring protection can be painted but, in addition, inert surfaces are sometimes painted for decoration. Many types of surface such as glass, plastics, leather, etc have been painted for this reason and can present attractive appearances.

PREPARATION

The general theme in quality painting and the most important point which cannot receive too much emphasis, is preparation. No preparation is too thorough. Each surface must be thoroughly prepared, cleaned and kept dry while the paint is being applied. If preparation is not thorough, it does not matter how many coats are applied, the paint film will not be able to fulfil its function. In the paint industry, most customer queries regarding product failure are invariably traced back to inadequate surface preparation because the user is always keen to complete the job and thinks that the paint can be used to hide dirty surfaces, which will save work. This is a very short-term approach and the repainting job arising out of natural laziness will probably take twice the time and cost money.

GREAT PALMS FROM LITTLE SEEDLINGS GROW



LITTLE SEEDLINGS GROW GREAT WITH OSMOCOTE

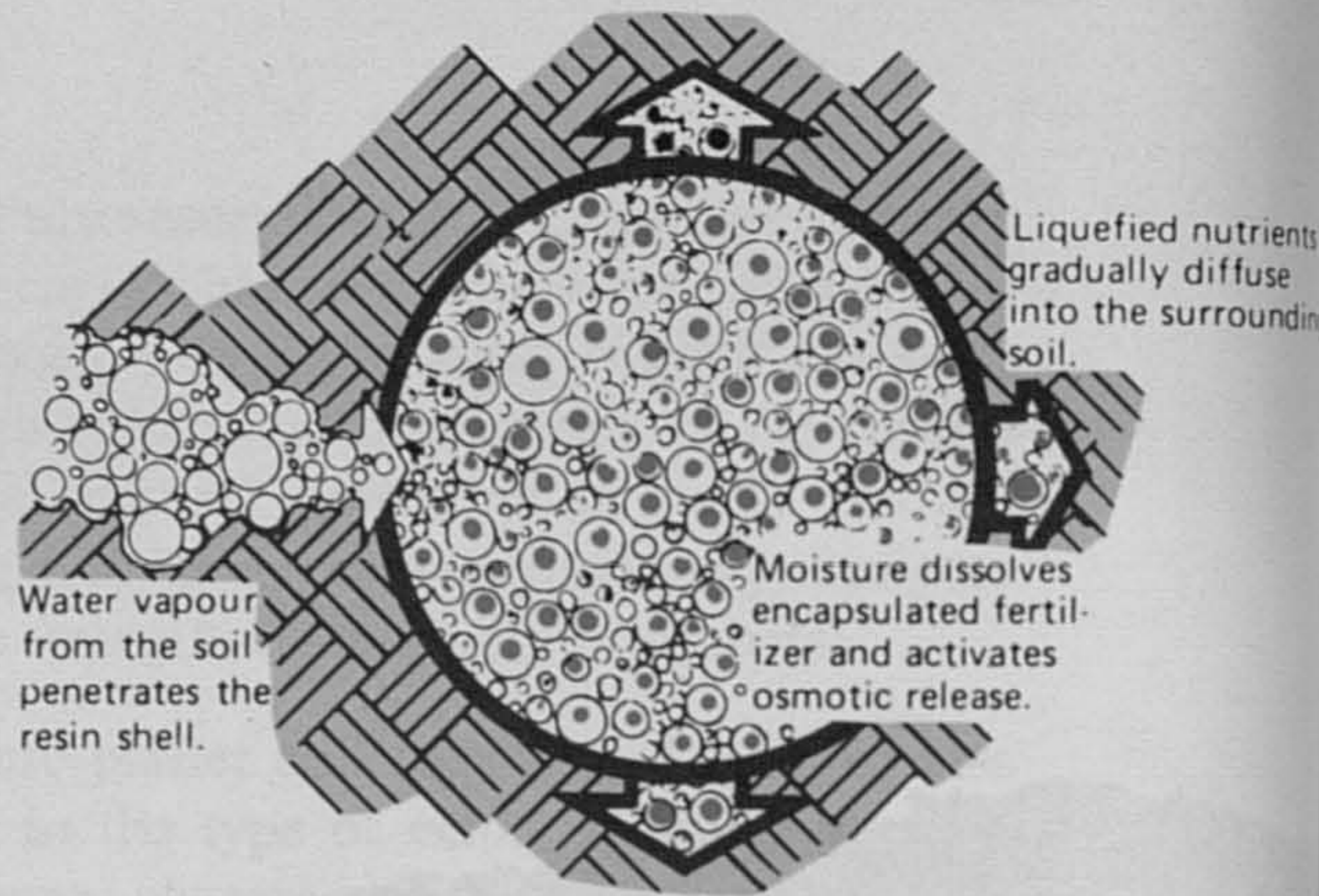
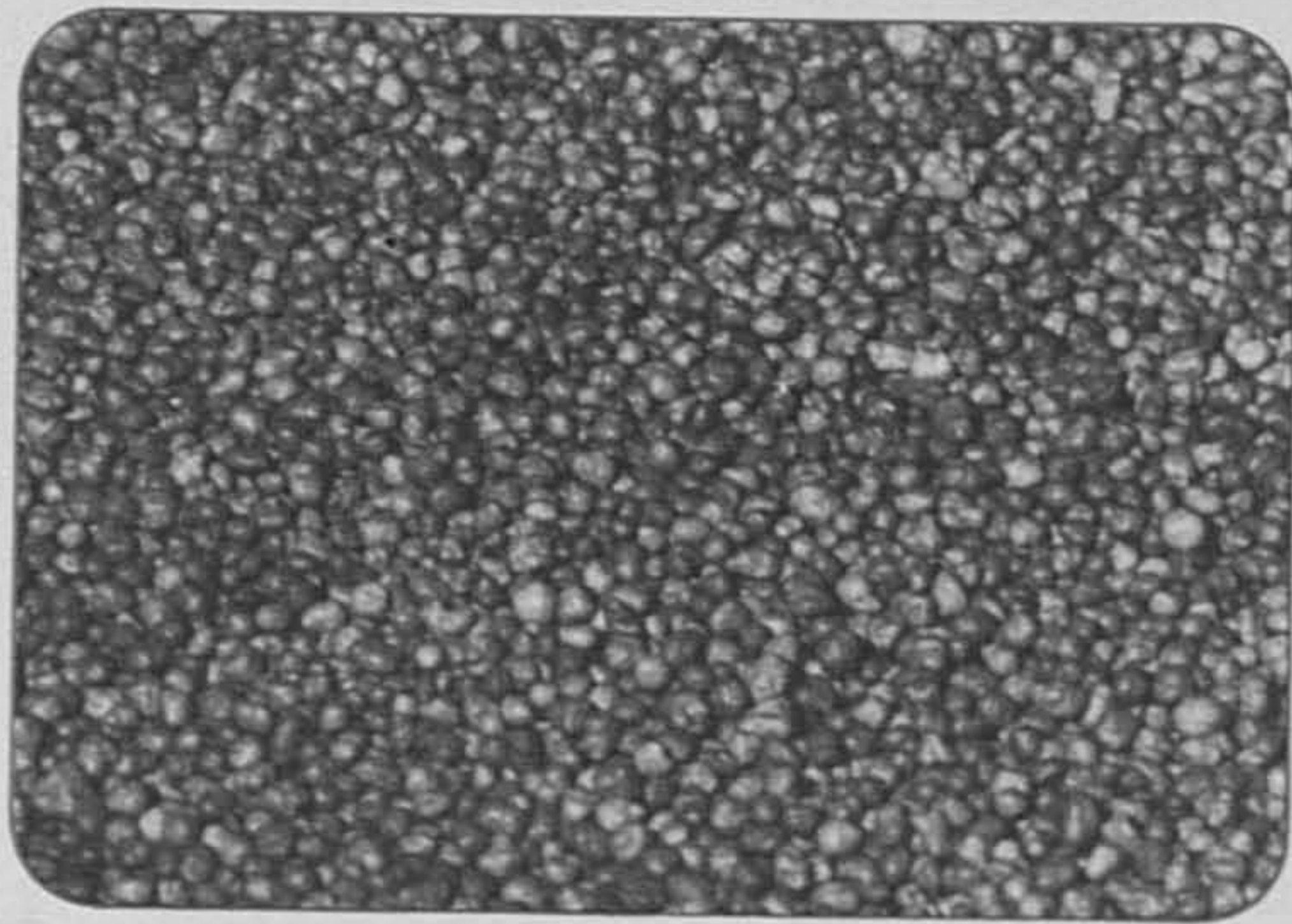
Palms require constant attention in the early stages if maximum development is to be obtained.

Nutrient requirements in young palms must be constantly available. With conventional compound fertilizers, a frequency of up to 22 rounds is required in a 10-month nursery to obtain the best possible results. Otherwise, uneven growth, higher plant mortality and poor planting material can be expected.

However, with Osmocote, a unique Controlled Release Fertilizer, two applications will be sufficient to feed palms evenly and completely for the whole nursery period.

unigro enterprises pte.ltd.





How Osmocote works

When Osmocote is placed in or on top of the soil, its polymeric capsule is penetrated by water vapour from the soil which forces its way into the nutrient core. The granules swell into tiny reservoirs of liquid plant food which begin automatically to meter predictable amounts of nutrients into the surrounding soil. Soil temperature is the major variable which affects the rate of release of nutrient.

Advantages of Osmocote

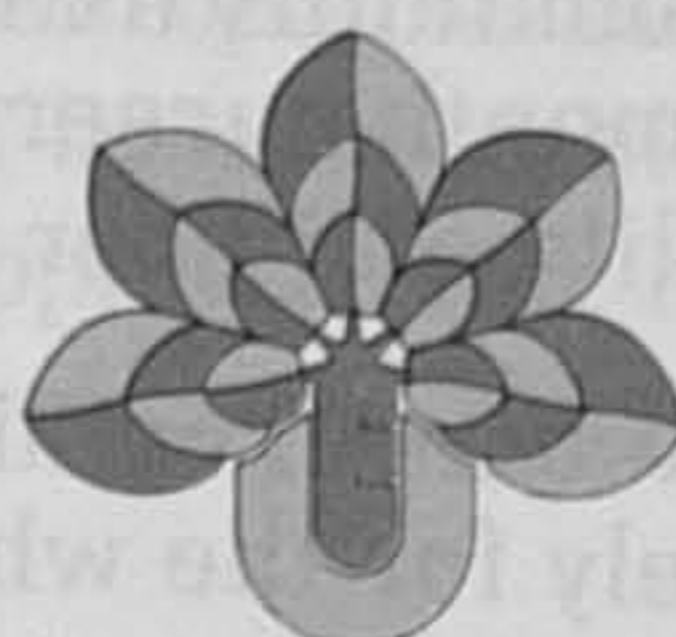
- Economical — cost of fertilizer used is lower than that of conventional compound fertilizers.
- Feeds Plants Continuously — day and night, rain or shine, with virtually no leaching loss.
- Lower Seedling Mortality at Nursery Stage — better uniform growth.
- Feeds Fully — regardless of soil type or pH.
- Eliminates danger of scorching.
- Tremendous labour savings.

Effect of external factors on Osmocote nutrient release

A number of basic studies of the influence of external factors on the rate of nutrient release from Osmocote have been conducted by various researchers. These studies have demonstrated that the following factors have **no significant influence** on the rate of nutrient release from Osmocote:

- **Soil moisture levels** from virtual permanent wilting percentage to field capacity.
- **External salt concentration** of the surrounding soil.
- **Microbiological population or activity** in the soil.
- **Total volume of water applied.**
- **Soil pH.**

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ROUNDUP^{*} NEWS 1976

Additional recommendations for new Roundup^{*} uses.

^{*}Trademark of Monsanto.

Monsanto's Product Development team explained that additional recommendations for Roundup now extends the uses of this unique herbicide.

Same product: Extended uses

Roundup's success in lalang control under rubber has been firmly established. Continuous research into applications now makes it possible to recommend Roundup for:-

- * Paspalum conjugatum and Ottochloa nodosa control in mature rubber.
- * Lalang control in all stages of rubber.
- * Lalang control in pre-plant areas for rubber and oil palm.
- * Lalang control in non-fruiting (i.e. immature) oil palm.
- * Lalang wiping.

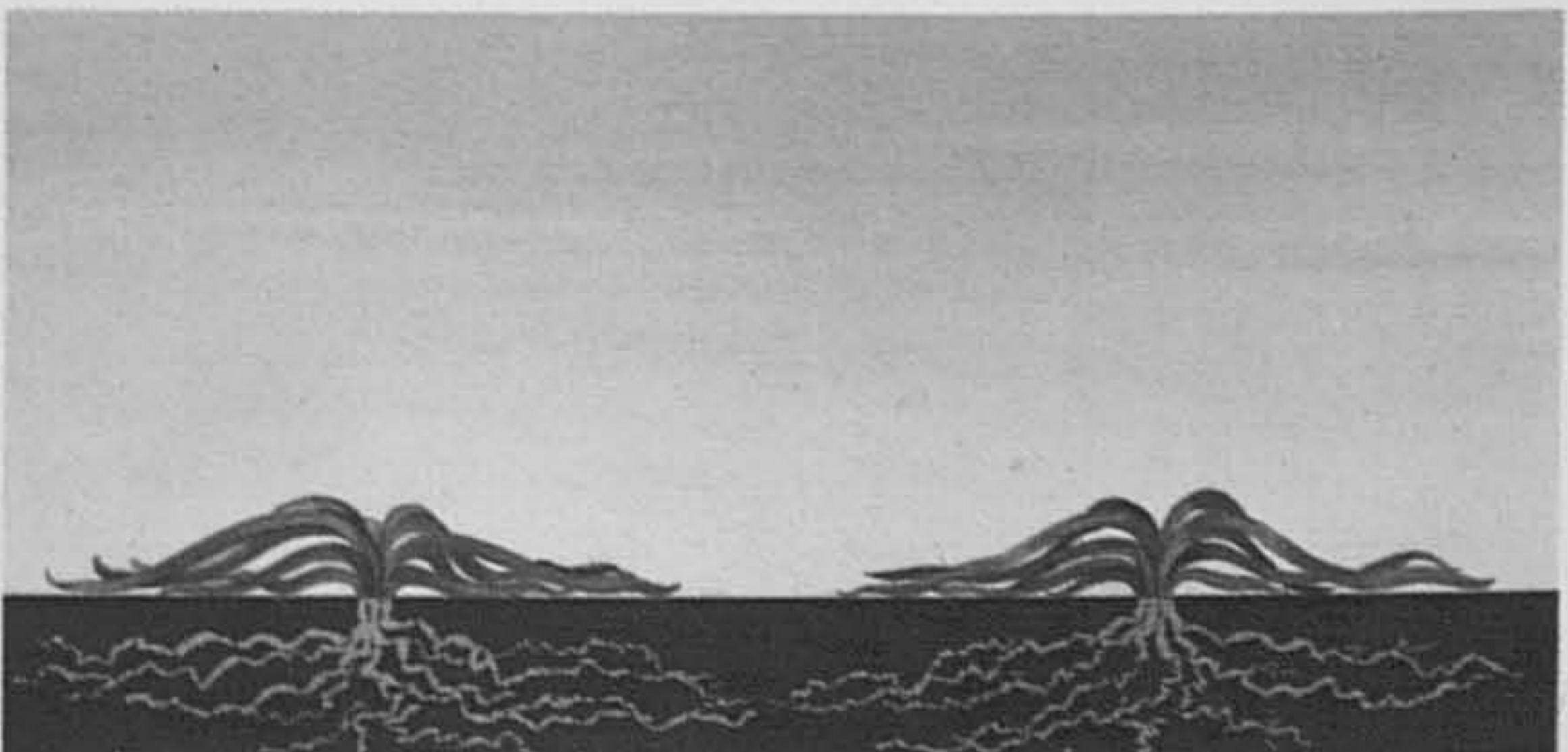
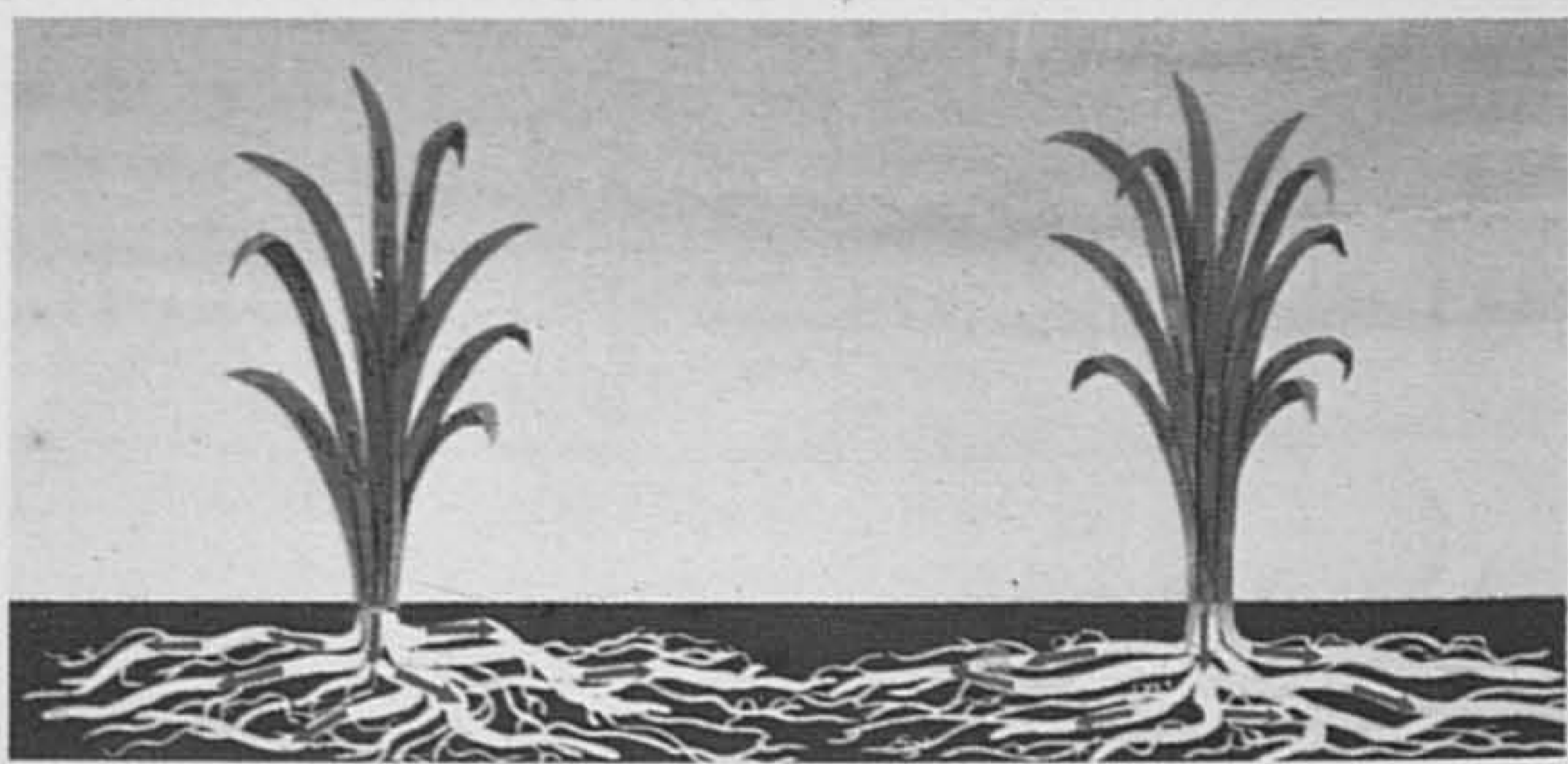
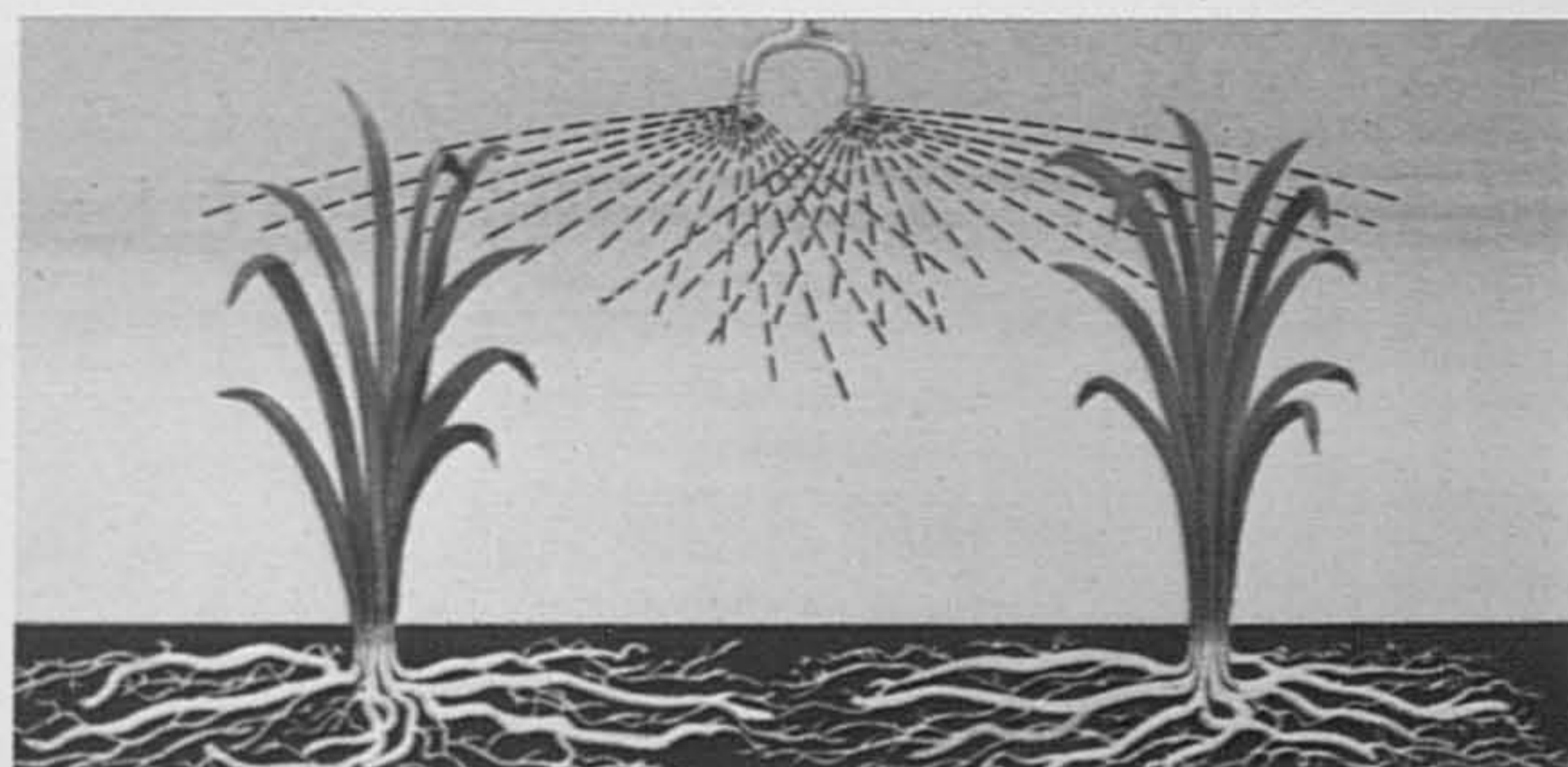
One-shot treatment

As planters have found, Roundup is effective with a one-shot treatment.

"Translocation" the basis of Roundup's effectiveness

Roundup works itself from the leaves into the root system to **destroy the entire weed** and not just the leaves. It is a **translocated weedicide**. The initial effects of Roundup may become

evident later than in the case of contact weedicides which only burn the leaves. **But its ultimate result is superior and longer lasting.**



Roundup discovery: Shade is the key to weed growth and vigour

Monsanto found that shade is a determinant of weed growth and vigour. In open conditions, weeds are tougher and less susceptible towards weedicides than those weeds growing under shade. For optimum results, Monsanto's Product Development team therefore suggests dividing your weed problem areas into percentages of shades. This will enable planters to judge more accurately the appropriate dosage rate of Roundup to use.

The picture below show the four broad divisions of shade which field survey indicates that planters and their experienced field staff can easily differentiate and use as a practical guide.



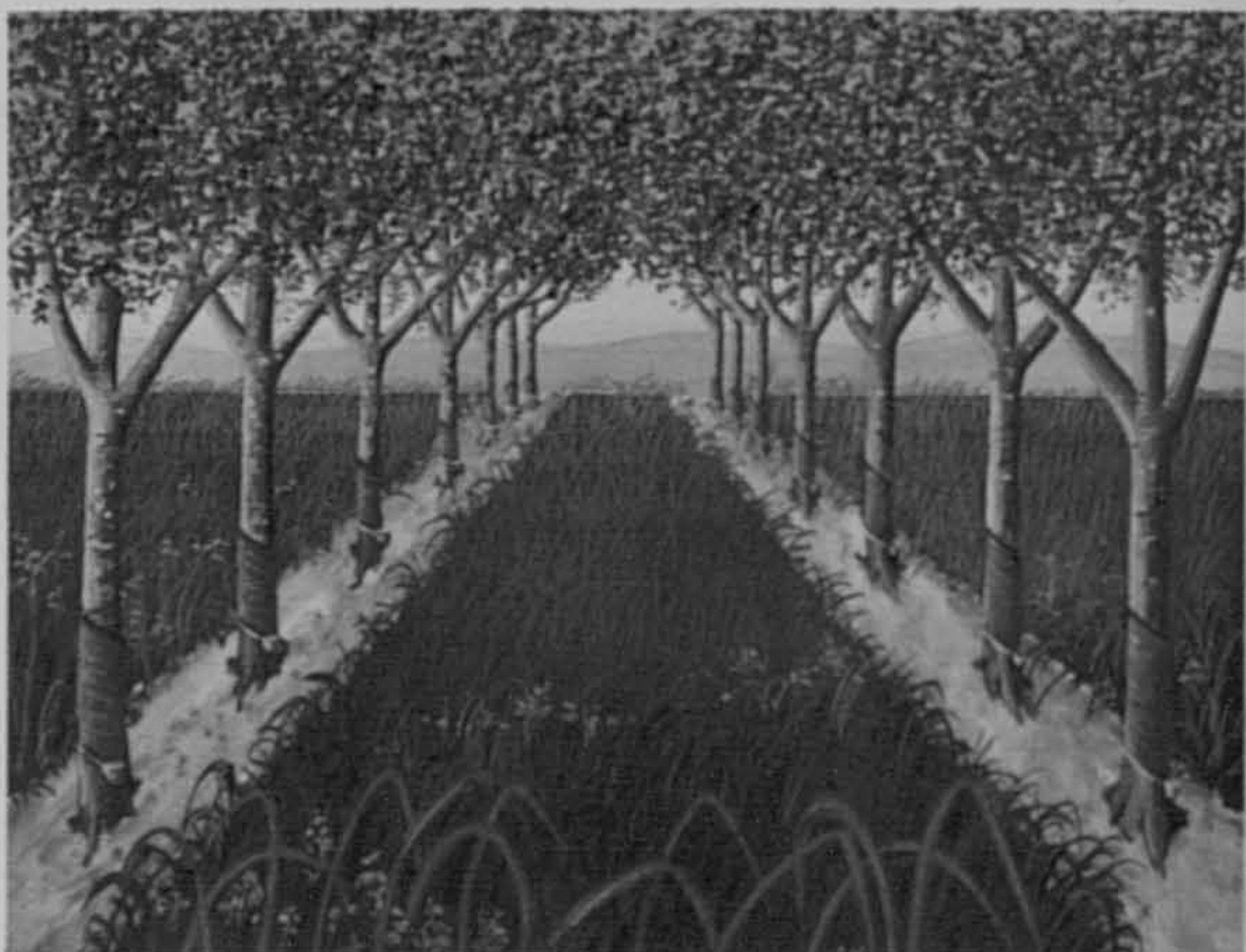
1. Pre-plant areas (0% shade)



2. Very Young Rubber (0% — 30% shade)



3. Young rubber (30% — 60% shade)



4. Mature rubber (60% plus shade)

These extended uses are the result of continuous research and testing Monsanto conducts to establish additional applications of Roundup in all areas of weed control.

You can expect recommendations for further uses of Roundup from Monsanto in the years to come.

**Continuous research
for extended uses.**

ROUNDUP.

POSTEMERGENCE HERBICIDE BY

Monsanto



WHY USE PAINT?

Paint, slightly different from today's composition, was used for decoration in pre-historic caves. The Egyptians, about three thousand years ago, discovered the protective advantages of a coating which dried. Paint is a material which is very easy to use and can give a wide variety of properties and colours at varying price levels. No special equipment is required for small-scale use and the product comes in convenient pack size making it easily transportable. Paint gives a very flexible method of good protection and ease of change of colour. It is not inappropriate to mention the importance of selecting good quality paint and using it in the way the manufacturer recommends.

SYSTEMS

Once the substrate has been prepared, the system of painting must be decided. The system refers to how the prepared surface is to be painted to give the final dried film, i.e. number of coats of which products plus the application method recommended. So often an inexperienced person using any product does not observe the procedure recommended by the manufacturer, and paint is no exception.

Within the system recommended, there are different types of paint which are specially formulated to meet their function within the system. These types can be broadly categorized as follows:

- (a) *Primers* formulated to give good adhesion to the surface and usually containing anti-corrosive pigments.
- (b) *Undercoats* which give good build to the system and dry to a surface which can be sanded down giving a good key for the application of the finishing coat. An undercoat is not normally recommended for use as a finishing coat.
- (c) *Finishing coats* have a wide colour range and must dry to give a coating which will present the best protection. As the finishing coat is the front line defence against environmental conditions, it is essential that the right product is used.

TYPES OF PAINT

Paint can be described as any *fluid* which will cover a solid surface and *dry* to give an obscuring skin. The quality of the paint is judged by the components from which it is made and the performance of the dried film (obscuring skin). Very broadly the main components of a paint can be placed in four main groups:

	Approx. %
Powder, called pigment or extender	5 - 30
Varnish, which carries the powder and gives a good film	30 - 70
Thinner, to make the paint easier to apply	10 - 30
Additives, for special properties	0 - 10

The paint formulator has to develop the actual formula to suit the customers' requirements.

Ideally, it would be very convenient to have one type of paint for all uses but unfortunately there is such a wide range of uses and cost constraints that it is necessary to split the products into groups associated with the common market in which the products are used i.e. painting buildings, motor cars, ships, and general light industries.

The cost of a product is always a critical factor of which everyone is aware. It is difficult to imagine the quality of the paint product by looking at the outside of the tin and it is often some time before the true quality of the product is appreciated. The paint industry has the added disadvantage of being very low capital intensive which means that many small manufacturers can start business. The products produced can be variable in quality due to inadequately controlled procedures. Paint technologists, to give the customer a good quality of product, deal with over 400 different raw materials and spend many months and sometimes years to ensure that the best products are available. The larger companies make great efforts to ensure that the paint product reaches the customer at consistent quality. These two factors alone, development and quality maintenance, contribute to cost and at first sight cannot be appreciated.

FACTORS AFFECTING QUALITY OF THE FINISH

The main theme of this paper is to emphasize the importance of top quality painting. Several factors have a direct influence on this and these can be summarized as follows:

- (i) The surface to be painted must be adequately prepared i.e. all grease, dirt, old and loose paint, and loose plaster must be removed.
- (ii) For the longest lasting protection, it is advisable to use the best quality product from a recognized manufacturer who makes every effort to ensure continuity of quality.
- (iii) The products must be used in the best system and it is often wrong to use different manufacturers' paints in the same system because a particular manufacturer's products will have been formulated specially for a particular system.
- (iv) The correct method of application, which includes thinning with the correct solvents, must be used. If these solvents are not used, the drying rate and the performance of the dried film can be adversely affected.
- (v) The final coated surface must be allowed to dry sufficiently before being subjected to extreme conditions.

Paint manufacturers and dealers are often asked for guarantees. This is a difficult and much discussed subject in the paint industry but the very high number of variables which can influence performance only allow indications of expected performance to be given. Even if maximum supervision is given during application, no one has yet been able to predict future climatic and environmental conditions which influence the length of life of the paint film.

U. K. TAXATION

ENTRY INTO THE UNITED KINGDOM FOR PERMANENT (OR PROLONGED) RESIDENCE

SUMMARY

This article is intended to acquaint persons living abroad who intend going to the U.K. for a lengthy stay or for permanent residence with the main aspects of tax which may affect them. The article also suggests a few ways in which the eventual tax liability might be reduced.

Anyone arriving in the U.K. for permanent residence will be regarded as "resident" and "ordinarily resident" there from the date of his arrival and the six months "free period" granted to temporary visitors is not applicable. He may already be domiciled but if not he will become domiciled also from that date.

A child takes the domicile of its father and if the father changes his domicile during the child's infancy its domicile will likewise change. On attaining majority a person will retain his then domicile until he abandons it and takes a domicile of choice elsewhere. To do this he must show that he has intention of living permanently elsewhere and that his stated intention is backed by his actions. Thus a person with a U.K. domicile would not lose it notwithstanding an absence of many years if he intended ultimately to return.

The taxation of the new "permanent resident" will depend on his sources of income.

SALARY AND LEAVE PAY

Sums paid in respect of the period from the date of arrival in the U.K. will now be exempt from U.K. tax, whenever remitted, as long as during the period preceding the date of arrival the tax-payer was regarded as not resident and not ordinarily resident in the U.K. for taxation purposes. This is normally the case where the taxpayer has been outside the U.K. for at least one full financial year (6th April to 5th April). Since the 6th April, 1974 special rules apply to emoluments in respect of short overseas tours, during which the individual remains technically resident in the U.K., and in these circumstances the overseas earnings will not automatically be liable to U.K. tax. It is in connection with "short" tours that periods of 63 days spent in the U.K. can be a relevant factor, although first reports of the new rules could have caused concern to many who will not be adversely affected.

GRATUITIES

Any gratuity paid before the cessation of the employment will be regarded as income, as will any gratuity to which the recipient is entitled under the terms of his contract, or which he can expect to receive, whenever paid. Only a gratuity paid after the cessation of the employment and to which the recipient had no right or expectation, escapes the classification as income. Even if the payment is classified as income it does not automatically follow that a liability to U.K. tax will arise.

PROVIDENT FUNDS

The treatment of Provident Fund payments is set out in the following statement issued by the Board of Inland Revenue:— "Income Tax is not charged upon lump sums referable to service overseas, and receivable by employees from Provident Funds (or under arrangements analogous to those of such a Fund) on termination of employment overseas".

PENSIONS

The treatment of pensions will depend, amongst other things, on where the fund, if any, is established. If the fund is outside the U.K. liability will attach to 90% of the pension whether transferred to the U.K. or not, and will be eligible for Double Taxation Relief. If the pension is paid by U.K. paying agents then tax will probably be deducted at source under P.A.Y.E. but if the pension arises from a fund established outside the U.K. liability extends only to 90% of the pension payable.

INVESTMENT INCOME ARISING OUTSIDE THE U.K.

This income would be liable to tax as it arose and whether or not it was sent to, or received in, the U.K. The basis of assessment on this type of income is normally the income of the year before. In the year of arrival for permanent residence the amount assessable is scaled down so that only a proportion of the preceding year's income will be charged.

INVESTMENT INCOME ARISING IN THE U.K.

These sums will usually have basic rate tax deducted at source; the income is treated as belonging to the year in which tax is deducted. United Kingdom tax suffered during the period of non residence may be recoverable, in whole or part, depending on individual circumstances.

CAPITAL GAINS TAX

The new "permanent resident" will also have to cope with this tax on capital profits. The year of change of residence is likely to be accompanied by much realisation and reorganisation of capital and it is, therefore, most important to note that the legislation gives no exemption for any gain realised whilst resident on the ground that it accrued wholly or in part before residence in the U.K. Liability extends (subject to certain exemptions) to gains realised by a person "resident" or "ordinarily resident" in the U.K. in the year. The intending permanent resident should therefore consider his position in good time before his arrival, whether or not the asset is in the U.K. and whether it is intended to realise it or retain it.

CAPITAL TRANSFER TAX

This new levy replaces Estate Duty — or Death Duty as it was often known. There are transitional provisions, but in many ways the old and the new tax differ. Fundamentally it is the scope of the charge which has been extended.

Whereas a liability to Estate Duty normally only occurred at death, Capital Transfer Tax is, subject to certain exemptions, payable on lifetime gifts as well as assets held at death. Individuals domiciled abroad are only liable to C.T.T. on U.K. assets, but those who acquire U.K. domicile bring their world-wide assets into the ambit of this particular tax. There are many ways in which one can legally minimise potential liabilities and provide for the reduced tax bill. The wisdom of husbands and wives holding wealth in roughly equal shares is perhaps basic, but a number of other fairly simple steps can be taken to reduce the impact of this far-reaching tax.

GENERAL

It will be seen that certain overseas funds will not be chargeable to tax at all and others will be taxable on an arising basis, with the question of what is remitted being irrelevant.

Full allowances and reliefs for the fiscal year will be due even though the date of arrival may only have been a few days before the end of that year.

Double Taxation relief will be available in respect of any personal tax borne outside the U.K. on overseas income which is taxed in the U.K.

PRACTICAL

If a person comes to the U.K. uncertain as to his plans for future residence he must be careful to make this clear when the question arises. If it is accepted that this is the case he will be treated as a temporary visitor.

If on arrival in the U.K. a person states that it is not his intention to remain permanently but he subsequently decides to stay, there are special rules for the determination of his residence status. Anyone who visits with the intention of remaining for three years or more would be treated as "resident and ordinarily resident" from the date of his arrival. The complexities of the law and practice of Income Tax in relation to "residence" and "domicile" are far too great to allow us to do more in this article than present a bare outline of some of the practical points.

ACTION

Because taxation plays such a large part in the financial affairs of the permanent resident of the U.K., it behoves the person returning there to consider the manner in which his capital is to be invested to secure the maximum tax advantages, appropriate to his needs. Over the years we have witnessed a growth in fund management and personal financial planning, so that today a very large portion of private capital finds its way into professionally managed portfolios.

These avenues of investment provide the individual with scope to arrange his affairs in a personal way, so that maximum income, maximum capital growth, or a combination of the two may be sought. In many cases guaranteed income bonds will be appropriate, whereas older tax payers may find the need for an

GOING ON LEAVE TO U.K.?

FOR CAR HIRE TRY P.W. BROWN & SONS

1976 RATES ARE:

Period of hire		HILLMAN AVENGER ESTATE (radio)	
A. Up to 4 weeks	C. 6 to 8 weeks	A. £34 per week	£39 per week
B. 4 to 6 weeks	D. More than 8 weeks	B. £32 per week	£37 per week
		C. £30 per week	£34 per week
		D. £28 per week	£30 per week
WINTER RATES	SUMMER RATES	VOLVO 144 (radio)	
October to April	May to September	A. £55 per week	£61 per week
HILLMAN AVENGER (Automatic)		B. £52 per week	£57 per week
A. £30 per week	£33 per week	C. £49 per week	£54 per week
B. £28 per week	£31 per week	D. £45 per week	£51 per week
C. £25 per week	£29 per week	MERCEDES 220/AUDI 100GL (radios)	
D. £23 per week	£26 per week	A. £61 per week	£66 per week
FOR CORTINA 1600L/HILLMAN		B. £57 per week	£63 per week
HUNTER 1725 (radios)		C. £54 per week	£60 per week
A. £32 per week	£37 per week	D. £51 per week	£56 per week
B. £30 per week	£34 per week	MERCEDES 240 Diesel (radio)	
C. £27 per week	£31 per week	A. £66 per week	£72 per week
D. £25 per week	£28 per week	B. £63 per week	£68 per week
		C. £60 per week	£65 per week
		D. £56 per week	£62 per week

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annuity to augment their retirement incomes. Retirement invariably necessitates a fundamental reorganisation of personal finances, and when this is coupled with a change of residence the problems often become more complex. For example, plans for house purchase may have to be made and the need for, or wisdom of, a mortgage with its attendant tax advantages considered. Perhaps for the first time, the possible effects of potential Capital Transfer Tax liabilities will have to be thought about and old Wills redrafted. In all these important decisions taxation in one form or another, will loom high on the list of priority considerations. Indeed, one would be imprudent to ignore such a basic, although perhaps unwelcome factor, in planning either a change of residence, or retirement, and where both events are occurring at more or less the same time the need for careful tax planning becomes even more necessary.

Editor's Notes:

This article has been contributed by the well known London Tax Consultants, Wilfred T. Fry Ltd., 13/14, Hanover Street, London W1R 9HG.

A team of specialists from Wilfred T. Fry Ltd., will be making a tour of Bahrain, Hong Kong, Malaysia, Singapore, Bangkok and Jakarta in October/December, 1976 and will be available for consultation. Interested persons may write direct to Wilfred T. Fry Ltd. for details of their tour itinerary.

Messrs G. K. Rogers and G. Jacobs will be available at the Kuala Lumpur Hilton from 25th to 30th November.

Which protects better, the outside or the inside?

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The monthly crop

King Honours Rubber Scientists. The Malaysian Rubber Research and Development Board (MRRDB) and the Rubber Research Institute of Malaysia (RRIM) have been singularly honoured with four awards on the birthday of His Majesty, the Yang Di Pertuan Agung (King) of Malaysia. The four recipients are Dr B. C. Sekhar, Controller of Rubber Research and Chairman, MRRDB, and, from the RRIM, Tuan Haji Ani bin Arope, Director, Dr E. K. Ng, Deputy Director for Research, and Encik Wong Siew Weng, Senior Research Assistant. Our heartiest congratulations.

Remarkable results in research to boost agricultural earnings. THE JUDICIOUS use of legumes can help the rubber and oil palm industries to increase their gross earnings up to \$600 million and \$60 million respectively, according to research carried out jointly by the Rubber Research Institute and the University of Malaya.

This estimate is based on the increase in yield each year when rubber and oil palm were grown in association with legumes.

In the case of rubber, the increase in yield was 200 kg of dry rubber per hectare per year (about 200 lbs of dry rubber per acre per year).

A yield increase of 400 kg of palm oil per hectare per year (about 400 lbs of palm oil per acre per year) was recorded from oil palm grown with legumes.

Proper estate management and the use of the correct legumes were essential to achieve these remarkable results.

Increasing even further these benefits is the aim of research being carried out jointly by the RRI and the university.

According to a statement by the University of Malaya, one of the products of this research — bacteria which together with legumes add nitrogen of the air to the soil — are now being sold by the RRI to estates and smallholders throughout Malaysia.

Nitrogen added to the soil by the bacteria is eventually absorbed by the plant and this is one reason for the increased rubber and oil palm yields.

The programme will benefit smallholders since crops such as long beans, ground nuts, soyabeans, dahl and kachang of all sort also add nitrogen of the air to the soil.

New bacteria are now available through the RRI for these crops allow optimal growth without the addition of nitrogenous fertiliser.

This work is being done as the RRI's and the MU's contribution to the Green Book Programme," the statement added.

It said that proper use of legumes and their attendant bacteria could make Malaysia virtually free of the need to import expensive nitrogenous fertilisers for use on these crops, saving the nation about \$20 million annually.

In connection with this both the RRI and the MU are organising a conference from August 18 to 21 to bring together smallholders, people from the estate advisory services, and scientists involved in the project.

Expert from the United States, Holland, Australia, the Philippines, Indonesia, Singapore, Thailand and Papua New Guinea will take part in the conference.

They will discuss research developments in soil microbiology.

Emphasis will be given to studies on soil microbiology and how it affects tropical soils and crops.

"Malaysia has become the regional centre for agricultural work of this sort and is constantly being called upon to give help to other countries of the region," the statement said.

New Straits Times Thursday, April 29, 1976

Private sector wages up 15.3 p.c., unions told. An analysis of the 137 collective agreements signed last year shows an average increase of 15.3 per cent in basic wages alone, said Selangor Industrial Relations Officer, B. Kumaran. He was speaking at the signing of a collective agreement between the National Union of Commercial Workers and the Malaysian Motor Traders Association. Mr. Kumaran said employers and their workers have been able to conclude mutually beneficial agreements and the workers concerned cannot be said to be a discontented lot. He said: "It is my view that the workers and employers and their organisations have not been bound hand-and-foot." "It is time that those who are most vocal and vehement in their criticisms of the labour laws count their many blessings also." Mr. Kumaran said the legal framework for collective bargaining between unions and employers were not inadequate or restrictive.

*Extract from the SECA (The Sabah Employers' Consultative Association)
News, Serial No. 46. N.S.T. August 15.*

Book review:

UNDEREXPLOITED PLANTS. — *Underexploited Tropical Plants with Promising Economic Value*. Report of an Ad Hoc panel of the Advisory Committee on Technology Innovation, Board on Science & Technology for International Development — Commission on International Relations. E. S. Ayensu and R. E. Schultes, co-chairmen. (with numerous contributors). National Academy of Sciences, U.S.A., Washington DC. 1975. 188 pages, illustrated.

This absorbing review, nicely produced in paperback, is available free of charge from the Commission on International Relations (JH 215), National Academy of Science NRC, 2101 Constitution Ave., Washington DC 20418, U.S.A. It contains seven chapters, each devoted to useful short reviews of a certain number of little-known or under-utilized plant species of potential economic value or of present but too limited use. The chapters are: Cereals, Roots and Tubers, Vegetables, Fruits, Oilseeds, Forage, and Other Uses. Some 35 species are discussed and others are mentioned, each being provided with an introductory discussion, research needs, a list of references, and finally (very important!) a number of contacts from which seed or other material for propagation may be obtained.

The considerable variety of plants mentioned nonetheless is but a fraction of what might have been included. For those in the plantation industry, in the research branches of agricultural institutions, or in the industrial sector (needing new raw materials) the book provides some extremely stimulating information. Some of the plants discussed are most suitable for Malaysia, for example the Naranjilla (*Solanum quitoense*); the Pejibaye palm; the Babassu Palm; Caryocar (oilseeds); the Buriti Palm; *Calathea lutea* (wax producer); and Ramie. The most unusual are the aquatic plants mentioned, especially the idea of cultivating shallow sea beds with *Zostera marina*. Algal cultures (*Spirulina*) are also mentioned.

This little book ought to be on the main desk of every plant scientist in Malaysia concerned with practical measures to enhance, widen and profit from diversification in plant culture.

At the end of the book is a list of other publications issued by the Board of this Commission, several of which would interest readers here. One in particular is a volume on the Wing Bean (*Psophocarpus tetragonolobus*). These are all available, free of charge, on written request.

B. C. STONE.

“Sandy’s Spice”

A. A. SANDOSHAM

Sunday School

I was told that even if attendance at Sunday School Classes didn't benefit me much I should have kept going to Church regularly. If I had done so it seems the sermons and the prayers would have assured me of a place in Heaven. She was astonished to hear me assert that I do go to Church regularly. I said I go to Church to attend the wedding, baptismal and funeral services of friends regularly – the matching, hatching and dispatching events.

It reminds me of an occasion as a medical student when I had written in my case history notes that the patient's bowels had opened regularly. The Professor, who was of the opinion that the patient's illness was partly due to chronic constipation, made me go into the details of her toilet habits and I found that she had her motions regularly once a week! He told me to remember that the woman has a more accommodating pelvis than the man and that she micturates once a day, defecates once a week, menstruates once a month, parturates once a year and copulates as often as she gets the opportunity.

Religion

I am no atheist because there is no future in atheism. Basically, the first principle of nature is self preservation. Death is inevitable but such is the instinctive urge to live that people turn to religion which promises them life everlasting, especially it is popular among the aged and ill to whom death seems imminent. In such circumstances even the agnostic says, “I wish to God I could believe in God”. To attain eternal life people are prepared to make incredible sacrifices. The Hindu achieves the Brahmin state when he no longer seeks the material wealth, possessions and attainments of the world. He attains Nirvana and reunites himself with the unending consciousness of the Universe. Christ preached to forsake all others and follow him. If Christians had taken him seriously, as three of my brothers have done, and lived their lives for the next world as enjoined by Ramakrishna, Buddha and other religious leaders the world would be wallowing in dung. To be heavenly minded is no earthly good. All the mystics and the logicians in the world ever offer man are rationalisations for poverty. Religion was just mass neurosis as suggested by Freud and my religious life was at an end when I realised it.

Church Going

A man in search of a place of worship which would suit him at last came to a Church where the congregation was kneeling before the altar and repeating with the Minister and saying, “*We have erred and strayed like lost sheep. We have done those things which we ought not to have done and left undone those things which we ought to have done.....*” He felt he was at last in the right place of worship.

Some go to Church because they cannot occupy themselves with the activities they would otherwise prefer. It seems a Priest standing in front of the Church porch on a Sunday morning and looking at the torrential rain coming down, told the Vicar, "*Once more the Good God has delivered unto us the golfers*".

The forgiveness of sins, promised the repentant, is another draw. Some girls get out every Saturday night to sow wild oats and pray for a crop failure the next morning. Sunday in fact is the sponge to wipe off all sins. When women get too old to be attractive to men or when the Devil wants nothing more to do with them they give themselves to God.

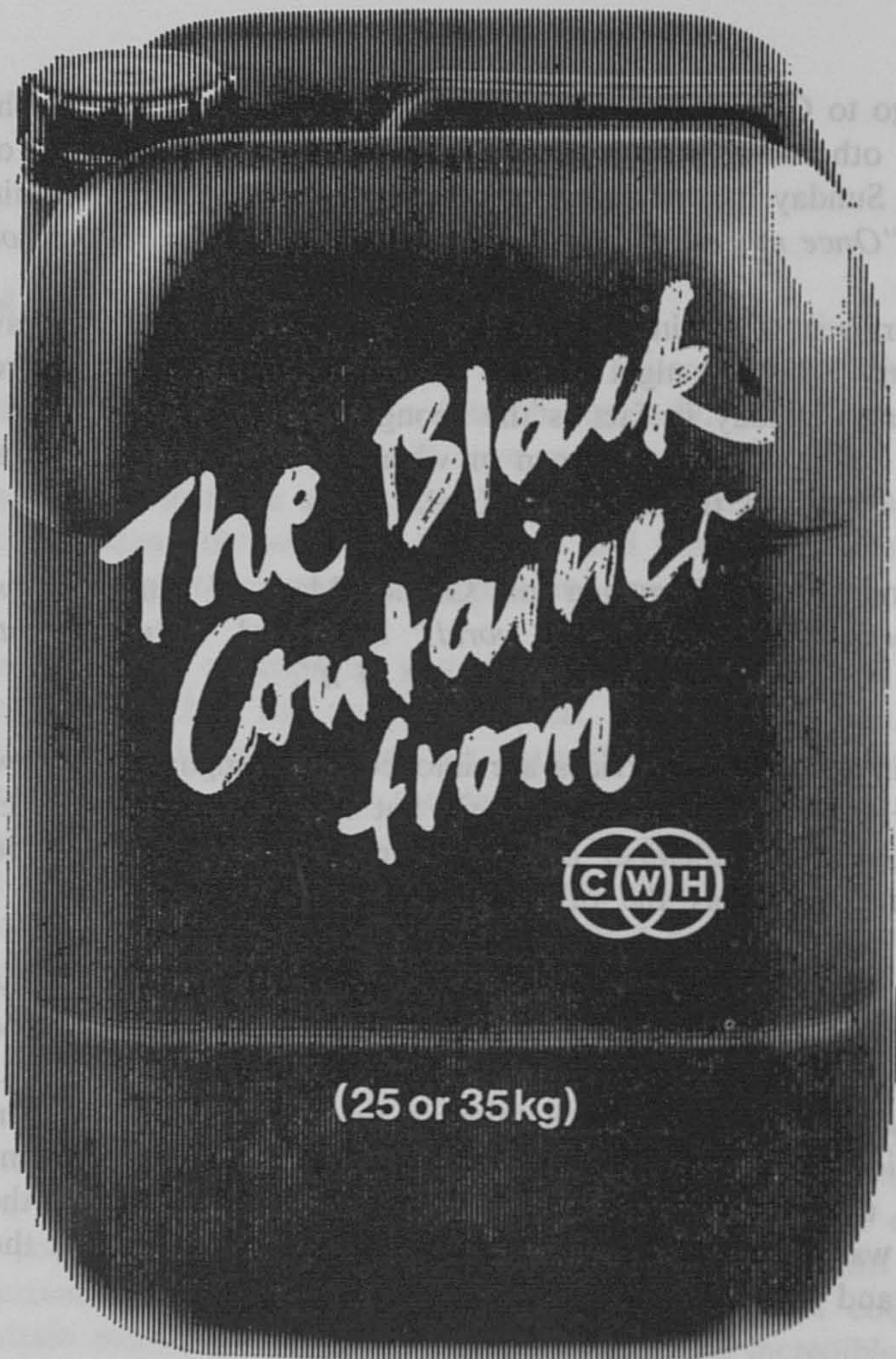
It seems when a clergyman told Grouch Marx "*I want to thank you for all the enjoyment you have given the world,*" he replied. "*And I want to thank you for all the enjoyment you have taken out of it*".

Sometimes religious services are intoned in a language unknown to the congregation. It may be Sanskrit or Latin but it is just Greek to the rest of them. It is a ritual and a member of the congregation sits down, stands up, kneels, crosses himself, etc. as the others do.

It seems some sailors walking along the street on a Sunday in a strange country heard some Church bells calling people to prayer. They decided to walk in and were shown into one of the front pews and, not knowing the language, decided they would do the same thing as the man in front of them. They knelt when he did, sat down when he did etc. The priest then said something and the man stood up. The sailors did the same, shocking the rest of the congregation because it was a baptismal service and the priest had requested the father of the baby to stand up.

I had forgotten that the lady has asked me what effect the sermons and prayers had had on me but as I have already filled the space allotted to me it must wait for another occasion.

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Social and Personal

Awards

BEK-NIELSEN, B. — Being conferred the title Dato Paduka Mahkota Perak (DPMP) by H R H The Sultan of Perak on the occasion of His Royal Highness' 52nd Birthday.

Birth

CHUA: To Ken and Joy Chua, a girl, Juanita Louise Chua Ai Ling on 6th September 1976 at the Pantai Medical Centre.

AWARDS OF ASSOCIATE DIPLOMA

Lim Kian Sang — (North Johore)

EXAMINATION SUCCESSES

Agricultural Science (Botany Section)

21st April 1976

Ho Kim Ang	—	(Selangor)
Goh Pey Seng	—	(South Johore)
John Chear Mun Kee	—	(Central Johore)
Teh Kee Lin	—	(South Johore)
Hamid bin Awang	—	(Central Johore)
Michael Modi Mijol	—	(Tawau)

Agricultural Science (Soils Section)

21st April 1976

Ho Kim Ang	—	(Selangor)
Lim Kian Sang	—	(North Johore)
Looi Eng Kooi	—	(Lower Perak)

Returned from leave

- 4685 Bamford, B.P., Sungei Terah Estate, Gua Musang, Ulu Kelantan.
 4878 Lee Beng Huat, Serendah Estate, Serendah, Selangor.
 4674 Lenggatt, Peter, Gedong Estate, Bagan Serai, Perak.

Change of address

- 6004 Boon Geok Gim, Felda, (Training Division), Jalan Maktab, Kuala Lumpur.
 6047 Chear Mun Kee, John, Kempas Klebang Estate, Paloh, Johore.
 4839 Cooper, B.C., AISP, Plantation Agencies Sdn. Bhd., P.O. Box 706, Penang.
 5573 Hay, D.W.E., Sungei Ular Estate, Kulim, Kedah.
 4008 Hutson, D.M., Bukit Serampang Estate, P.O. Box 506, Tangkak, Johore.
 5638 Kugarajah, S, Kelan Estate, Kulai, Johore.

- 4998 Leask, J.C., CEP Niyor Estate, P.O. Box 514, Kluang, Johore.
- 6338 Mohamed Daud bin Mohd, Sua Betong Estate, Port Dickson, Negri Sembilan.
- 5920 Marz, H.R., Chevron Chemical International Inc., P.O. Box 102, Greenhills Post Office, Rizal 3113, Philippines.
- 5938 Mohd Jamzari Wasi, Ulu Bernam Estate, Ulu Bernam, Perak.
- 5764 Ong Hong Tong, Thomas, AISP, c/o Lt Col Goh Siew Chong, 351-G St Thomas Road, off Ipoh Road, Kuala Lumpur.
- 5678 Subramaniam, L, AISP, Jendarata Estate, Teluk Anson, Perak.
- 4047 Sergeant, C.J., NDA, AISP, Sime Darby Plantations Bhd., P.O. Box 157, Kuala Lumpur.
- 5817 Sivaprasad, V.G.P., Bute & Dominion Estates, Nilai, Negri Sembilan.
- 5358 Tang Sew Hon, AISP, Ulu Bernam Estate, Ulu Bernam, Perak.
- 6011 Tan Kim Chye, Si Khiong Industries Sdn. Bhd., P.O. Box 240, Tawau, Sabah.
- 6138 Tay Kim Puan, Stoughton Estate, Rendang Panjang, Ijok, Perak.
- 4756 Tan Teck Wah, Bukit Badak Estate, P.O. Box 108, Layang Layang, Johore.
- 6459 Visuwanathan s/o Navaratnam, Lanadron Estate, Panchor, Muar, Johore.
- 5066 Yap Pit Kwang, AISP, SPP Sdn. Bhd., Hutan Melintang, Teluk Anson, Perak.
- 5313 Yeoh Oon Tit, AISP, Tennamaran Estate, Batang Berjuntai, Selangor.

Corrigenda

The Planter Vol. 52 No. 605 (August 1976)

- (i) Page 321, second line of para 3 — figure 8.3 should read 0.3.
- (ii) Substitute Table 2 with the following :—

Table 2. Sweat box specifications and arrangement.

	<i>Fermentary No. 1</i>	<i>Fermentary No. 2</i>
Construction material	Chengal	Chengal
Arrangement	step-wise	step-wise
Box per series	6	6
Box size	all 70 × 40 × 33 in.	1 + 2 = 198 × 72 × 24 in. 3 — 6 = 102 × 66 × 39 in.
Box capacity (wet beans)	3,000 lb.	8,000 lb.
Perforations — walls	Lower half only 0.5 in. holes on 5 in. grid	0.5 in. holes on 4 in. grid
— floors	0.5 in. holes on 5 in. grid	1.75 in. slats 0.25 in. apart



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COCONUT TARTS

For Pastry: ½ oz butter
 4 oz sugar
 1 lb flour
 1 egg
 ½ teaspoon vanilla essence

To prepare: Mix together butter, sugar and egg. Add flour and essence until the dough begins to come away from the sides of the bowl. Roll out to ¼" thickness and cut with a fluted round pastry cutter. Fit each round into a lightly greased cupcake or individual tartlet baking tin.

For coconut filling:

8 ozs egg white or the whites of approx. 8 eggs
 8 ozs sugar
 8 ozs dessicated coconut
 Rind of 1 lemon, grated
 4 ozs chopped almonds

To prepare: Mix ingredients in a pan over a small flame for about 5 to 8 minutes until the mixture has thickened a little. Remove from flame and cool.

Fill the mixture into the uncooked pastry shells. Bake tarts in a moderately hot oven of 380 degrees F (Gas Mark 5) for 30 to 35 minutes. Sprinkle some granulated sugar over surface for decoration and leave to cool.

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