

He also tells us that a deficiency in Vitamin A is associated with such diseases as inflammation of the eyes, ears, nose, throat, lungs, stomach and bowels. Night blindness may be due to a deficiency of this vitamin.

There are of course many other sources of Vitamin A besides that described here. A study of the book mentioned will show what these are.

Reference:—'Food' by Lt.-Col. Robert McCarrison, C.I.E., M.D., D.Sc., L.L.D., F.R.C.P., I.M.S.

Macmillan and Co., London; Madras; etc. Price As. 12. All profits from the sale of this book are given to certain Indian charities.

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REVIEW OF THE COPRA MARKET (October 1929)

by D. H. GRIST, Federated Malaya States,

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INTRODUCTION. The world's marketed production of copra is estimated to be slightly in excess of one million tons per annum, of which Malaya's exports form nearly 20 per cent. The product is graded on the European market according to the country of origin; the accompanying table indicates the existing grades, the average prices obtained, and the approximate quantities shipped annually.

TABLE I

Grades and Values of Copra

Grade	Average price per ton (Nett Cash C. I. F.) London	Average Quantity Shipped per annum (Tons)
F. M. S. *Ceylon ...	24 5 0	95,000
F. M. S. Java ...	23 10 0	40,000
F. M. S. Straits ...	23 7 6 }	180,000
M. S. Straits ...	22 12 6 }	
F. M. S. Dutch East Indies ...	23 7 6 }	360,000
M. S. ...	22 12 6 }	
F. M. S. Ceba ...	22 17 6 }	200,000
F. M. S. Manila ...	22 10 0 }	
F. M. S. South Sea ...	22 17 6 }	150,000
Kiln dried South Sea ...	22 10 0 }	
Average ...	£ 23 1 9	Total 1,025,000 tons.

In view of what follows, it should be noted that those grades which command the highest price (F. M. S. Ceylon and F. M. S. Java) bear but a small proportion (approximately 13 per cent.) to the total quantity

*F. M. S. = Fair Merchantable Sun-dried.

marketed ; while exports of the high grade Malabar copra have entirely ceased.

The Decline in the Price of Copra. A review of the existing condition of the copra market cannot be undertaken without comparing this oil seed with the remaining oils and oil products. During recent years, the price of oils and fats generally has appreciated. Thus, taking the pre-war index price as 100, the average price of oil seeds in August 1929 stood at 137, that of oils and fats at 122, and oil cakes at 155. (It may be of interest to compare these figures with Cereals at 140 and 'Sundries'—including such widely dissimilar products as beef and iron—at 119). The only two oil seeds which do not share this prosperity are copra and palm kernels, the figures for which are 90 and 93 respectively (i.e., they are actually below pre-war level). It will therefore be observed that, at present, other oil seeds command a price approximately 50 per cent. higher than that of copra, from which it may be argued either that other oil seeds are too expensive or that copra is too cheap. Whichever of these alternatives is correct, the current opinion of many on the market is that copra has about reached its rock bottom price, but that its recovery will be slow.

The decline in price of copra is shewn by the following figures, which shew the average price of F. M. S. Straits Copra, C. I. F. London during the past few years:

TABLE II
Average Prices (C.I.F. London) for Straits Copra

Year	Price per ton	Year	Price per ton
1916	£ 33 13 0	1923	£ 27 17 6
1918 (controlled) ...	45 10 0	1924	29 15 0
1919	52 10 0	1925	30 5 0
1920	56 7 6	1926	28 12 6
1921	30 12 6	1927	27 10 0
1922	24 15 0	1928	26 17 6

It will be observed that since 1925 the price of copra has steadily depreciated by nearly 10 per cent.

Reasons for the Decline. It should be clearly understood that the fall in the price of copra must be attributed to a number of causes and not to any one cause in particular. It has been asserted that the activities of a combine of crushers, which is said to control the European market to a great extent (especially in edible oils), has brought about the present slump. While there is no doubt that the combine can affect prices, the writer is of opinion that the principal reasons which have assisted their ends were actually outside their control.

During the past decade, there has been a very striking increase in the world's production of edible oils. The part played by copra in this

increase is shewn in the accompanying table, supplied by the Empire Marketing Board and based on figures published by the International Institute of Agriculture

TABLE III
World Exports of Copra (in thousands of tons)

	(Average) 1909-1913	1914	1925	1926	1927	1928
British Malaya	4	92	86	104	97	95
Dutch East Indies	234	338	335	371	300	431
Philippines	128	154	145	171	196	234
Ceylon	41	88	113	121	99	99
South Seas	70	139	148	159	159*	...
Unspecified	68	64	80	82	62	...
Total ...	545	875	907	1,008	913	...

Similar increases have been experienced in the case of oils and fats which compete with copra. The principal competitors at the moment are groundnuts (the exports of which are shewn in the accompanying table), and whale oil.

The future planting of groundnuts will undoubtedly be liable to fluctuation according to the trend of prices.

TABLE IV
World Exports of Ground-nuts (in thousands of tons).

	1909-13 (Average)	1924	1925	1926	1927	1928
British India	102	243	463	444	475	749
French West Africa	205	312	444	480	401	386
British West Africa	64	139	176	188	160	195
China	39	196	168	176
Unspecified	55	102	82	89
Total ...	55	902	1,333	1,377		

* Provisional.

The production of whale oil, which is largely used in the edible oil trade, has made great strides in recent years. Figures of production indicate an increase from 109,000 tons in 1922 to 203,000 tons in 1927 and 226,000 tons in 1928. Production in 1929 is expected to shew a further material increase. There is reason to believe that local copra producers do not realise that whale oil is perfectly suitable for margarine production, and is in no way inferior to copra oil for this purpose. The whaling industry is better organised than ever before and the number of companies engaged in whaling has increased considerably of late. Whale oil at £25 per ton is said to give a profit to the producer of 25 per cent. Little appears to be known of the habits of whales, and it is therefore impossible to compute the apex of production of this class of oil ; but it seems reasonable to anticipate that the slaughter of increasing numbers of whales must soon affect the amount of oil available from this source, by reason of the decrease in their population. At present, however, copra oil is quite unable to compete with whale oil for edible purposes. The present slump in glycerine has also had its effect on the price of oils and fats for the production of soap.

Quality of Copra. The existing method by which purchasers of copra estimate its value is entirely based upon its appearance to the eye. A visitor to the London Copra Association, a body whose sole function is arbitration between buyer and seller, will find no apparatus for chemical analysis, but merely a long bench in front of a window on which the samples are exposed to the scrutiny of the arbitrator. Although this method may appear unreliable, it should be remembered that it is based upon the experience of the valuer who appreciates the relationship between external characters and oil content ; and that this relationship is based upon the fact that good appearance indicates careful preparation ; with low moisture and free fatty acids content, and therefore a comparatively high oil content. The method has the advantage of enabling large numbers of separate consignments to be marketed without the delay entailed by chemical analysis.

In the valuation of copra by appearance, the following points are taken into consideration :—

- (a) *Colour.* The colour should be as white as possible.
- (b) *Size and Thickness.* The copra should be thick and should not contain too great a proportion of small pieces.
- (c) *Cleanliness.* The copra should be free from extraneous matter.
- (d) *Moisture.* Air-dry and free from moulds.

A white copra will produce an oil of good colour. Thick large copra facilitates crushing, and lessens the liability to development of free fatty acid. Moulds are related to a high free fatty acid content and are caused by delay in drying the copra or by subsequent damage by water. Rapid drying is essential for the production of good copra. Moisture causes copra to deteriorate very rapidly ; and once it has become wet, although again dried subsequently, the fact remains evident in the poor condition of the copra. Finally, the presence of pests naturally deteriorates the copra.

TABLE V.
Quality of Copra

Origin	Percentage		
	Oil	Moisture	Free Fatty Acids
F. M. S. Dutch East Indies ...	66	4	0.8
F. M. S. Demerara ...	69	5	1.25
F. M. S. Straits ...	66	4	1
F. M. S. Jamaica ...	69.5	4	1.25
F. M. S. Mauritius ...	68	3.5	1.25
F. M. S. Mozambique ...	67	3.75	1.25
F. M. S. South Sea ...	67	3.5	4.5
F. M. S. West Indian ...	70	1.5	4
F. M. S. Ceylon ...	68	...	1

From the above, it will be seen that the object is to judge the copra on points which indicate a low percentage of moisture and a high percentage of oil of good colour, and economy in manufacture.

Table V gives the average quality of copra from different sources.

Samples of Ceylon copra examined by the writer with arbitrators at the London Copra Association were superior in appearance to those of Straits Copra. The meat of the former was thicker and of better colour, it was cleaner, and it had a sweeter smell. The writer is of opinion that thinness of flesh is more frequently than not due to inferior methods of preparation rather than to variety of coconuts, soil or climate. All the genuine sun-dried copra examined by the writer was thicker than the kiln-dried copra.

Improvement of Quality by Legislation. In certain Crown Colonies, attempts have been made to enforce an improvement in the quality of exported copra by means of legislation. The writer is not familiar with the standard of copra exported from these colonies prior to the introduction of such legislation; but, judging from the few samples of copra from such sources seen in London, the writer was not impressed by their present quality, while brokers who were questioned on the subject were sceptical of the effectiveness of these measures.

Standards of Copra. As already stated, copra is bought and sold—not on analysis of a sample—but on a standard based on appearance. It should be added that a separate standard has been laid down for each producing country and that there is no general standard. The designation F. M. S. Straits for instance, means Fair Merchantable Sun-dried Copra from the Straits Settlements or Malay States. It may also apply to copra from the Dutch East Indies re-exported from Malayan ports. In passing, the writer would remark that some of the so-called sun-dried accepted on the London market appears to be kiln-dried, or a mixture of kiln and sun-dried copra.

The standard set down for each country of origin represents the average quality of copra received from that country. It should be emphasised that the purchaser of copra, knowing the country of origin of his purchase, sees no sample, but he understands that the delivery will

conform to the standard agreed upon for copra of that particular origin. Should the consignment not reach that standard he will arbitrate; but should it be superior to the standard he will naturally have nothing further to say on the matter.

From the above facts it is considered that, even if Malayan planters improved the quality of their copra, there would be no prospect of an immediate corresponding rise in price. All copra dealers state that the quality of copra from the Malay States is satisfactory, and it is therefore evident that copra of this quality fills a particular demand. It is of course possible either that a local buyer, anxious for high grade copra with which to level up his stocks, may offer a premium for special quality copra, or that a special market for high grade copra might be obtained in Europe by private arrangement. But, generally speaking, the producer can expect no higher price for copra than the standard laid down for the country of origin. It should also be remembered that any improvement in quality would probably involve an increased cost of production, which would not be justified unless a commensurate increase in selling price were forthcoming.

One important manufacturer of edible oil products definitely asserts that the quality of Malayan copra is satisfactory. He points out that modern crushing and refining machinery is competent to deal with medium or poor quality copra, so that it is far less essential than hitherto for copra to be of high standard.

From Tables II and V it will be found that the unit cost of oil from Ceylon copra is 7.35 shillings as against 6.86 shillings per unit of Malayan copra. If crushing and refining plant can effectively and cheaply deal with the latter, it seems probable that the price of Ceylon copra will tend to approximate more closely to that of Malaya. The writer is informed that there are still some factories which prefer the Ceylon product because they are less capable of dealing economically with lower grades. But it is possible that, as old-fashioned machinery is replaced, the present premium on Ceylon copra will gradually disappear, and that an up-grading of Malayan copra will not have a similar effect on its selling price.

Reference to Table I shews moreover, that the proportion of high grade copra is relatively small. This fact, in conjunction with the general satisfaction with Malayan and similar grades, adds strength to the contention that if the standard of Malayan copra were improved and were to approximate to that of Ceylon, there would be no immediate improvement in price. Later, when the market realised that the Malayan product had improved, there would be, not a rise in the price of improved copra, but a reduction of the premium allowed on Ceylon copra.

Provided that the average oil content of Malayan copra can be definitely raised, even by 2 or 3 per cent., it is possible that a higher price may ultimately be realised. But the evidence at present indicates that such an improvement in quality would not lead to an immediate rise in price. In these circumstances it is unlikely that any proposals for improving the existing quality of copra would find favour with directors or managers of coconut estates in this country.

It may be urged that this report lays undue emphasis on edible oils and ignores the undoubted necessity of vegetable oils for soap making. But the use of oils for edible purposes is undoubtedly the crux of the question, and it is to be increased consumption of edible oils (in such

products as margarine and ghee) that one must look for any appreciable recovery of the price of copra generally.

Prospects of Consumption. Supplies of copra are at present adequate ; and as already stated, other oils are coming on to the market in increasing quantities. Perhaps the most encouraging feature of the present position is the fact that the market has been able to absorb the enormous increase of edible oil which has been thrown on the market. This absorption has certainly been at the sacrifice of price, but the absence of large unabsorbed stocks encourages one in the belief that the oil market will require constantly increasing amounts of oil to keep pace with the ever growing consumption. An important opinion was expressed to the effect that the oil market can easily absorb all production of oils for the next 20 years, as consumption is increasing by leaps and bounds.

SUMMARY

The price of copra since the War has not advanced in line with that of other oil seeds. The grades and values of copra are stated together with the approximate annual production of each. The figures demonstrate that there is a relatively small proportion of high grade copra on the market.

The causes for the fall in the price of copra are examined. It is held that the major reasons are purely economic. The two chief reasons for the present low price are the rapid increase in the world production of other edible oils, and in particular, to the strong competition of the whale oil industry.

The methods of judging copra by appearance, and the qualities which are indicated thereby, are stated.

The method of purchasing copra on standards based upon country of origin and not on sample, is explained. It is argued that any improvement in the quality of Malayan copra will not be reflected in an immediate increase in price.

The opinion is expressed that legislation to enforce improvement in the quality of exported copra has not been effective.

Conclusion. Owing to the peculiar methods of buying copra on standard, producers cannot hope for any immediate improvement of price for a corresponding improvement of quality. There is probably some scope for copra of good quality—which may command a premium for grading up native-produced copra. It is extremely doubtful whether any premium obtained, either by private treaty or the recognition of the London market, would be commensurate with the extra cost of production.

For the above reasons, it is evident that the application of any results achieved by research work on the improvement of the quality of copra will not be altogether easy. It will be necessary to overcome the strong prejudice of the Trade against any change in the present methods of marketing ; while, especially in periods of market depression, any suggestion for the improvement in the quality of copra, which may entail additional expense without a corresponding immediate increase in price, may probably be received, in the first instance, with disfavour by producers.—*The Malayan Agricultural Journal, February 1930, Vol. XVIII, No. 2.*

NOTES AND COMMENTS

We note with extreme regret that M.R.Ry. V. Muthusami Ayyar Avargal, has sent in his resignation of the place of the Resident Vice-President of the Union. Connected with the Union as he has been, for over a decade, and working with whole-hearted enthusiasm, in spite of physical and other disabilities, it was hardly expected that he would send in his resignation at a time when the Journal had entered an era of great usefulness and patronage, as a result of the special efforts of the Committee. The Committee have in accepting his resignation with great regret, recorded their appreciation of the valuable services rendered by Mr. V. Muthusami Ayyar as Vice-President, as Editor and as a member of the Union.

We offer our congratulations to Rao Bahadur M. R. Ramaswami Sivan on his election to the Syndicate of the Madras University.

Our sincere congratulations go to Rao Bahadur V. N. Viswanatha Rao, lately Statistical Assistant to the Director of Agriculture, Madras, on his promotion as Collector of Tinnevely.

State Support for Research in America

An account of the Report of the Work of the Agricultural Experiment Stations of the United States Department of Agriculture, America for the fiscal year ending June 30, 1928, given in the Editorial of the Experiment Station Record, Vol. 61, No. 7, Nov. 1929, forms refreshing reading. The report is designed to summarize the progress of the stations as a whole during this period and to discuss the work, the findings and the outlook of these institutions as components of a national scheme of research.

"The development of fundamental research with an ultimate practical aim has come to be the prevailing idea in experimental station work. The growing intensity and specialization, with laboratory and controlled facilities so largely taking the place of natural farm conditions, has not made the experiment stations or their experts any the less practical. On the contrary, it has made them more efficient and reliable, and able to reach further into an understanding of the factors and the reasons involved in complex questions—to follow much further the connection between causes and effects.

"The search for fundamental knowledge" it is stated, "frequently leads into the field of pure science, but by this means a surer foundation is laid for the solution of practical questions. It is only by such means that the 'what', 'why' and 'how' of many basic questions can be determined, and until this is done no problem can be considered intelligently solved. In the realization of this and with increasing financial support stimulated by public confidence and demand, the stations are expanding their fundamental studies along with the scope and variety of their activities, and with these things come a clearer conception of what is involved in the effective organization and execution of research."

"A further idea of the growth of the existing national system may be gleaned from the statement that in addition to the more than fifty

stations receiving Federal aid in the various States and Territories and more important insular possessions, there are no fewer than 114 *sub-stations* of a permanent nature connected with the State stations, designed to serve the problems of special localities or particular branches of the agricultural industry, such as cranberry-growing, the blueberry industry, tobacco growing, the cattle industry under range conditions, and the like. The work in the States is further supplemented by 59 *experimental farms*, and 255 *experimental fields* employed to carry on test of the local adaptation of crops and practices, determine the fertilizer needs of different types of soils, etc. Considered collectively it is indicated that from small beginnings the system has become not only 'the most extensive and far-reaching one ever built up for agricultural inquiry ; it is the largest organized effort for research in any branch of science or industry. And it is still a growing enterprise.

" The development of the present magnitude is a reflection of the great confidence in the power of research, especially when it is organized and is directed to the vital problems of the industry in their local and national aspects. The broad and extremely varied nature of these problems as presented by the wide extent of the country, and the fundamental relations of these problems to the ability of the industry to cope with and adjust itself to changed conditions, are an irresistible challenge to administrative officers and workers alike. And the confidence so abundantly evidenced by Federal and State appropriations and by the provision of modern buildings and other needed facilities, presents a responsibility for the effective organization and administration of this great enterprise which no one in authority can fail to realize."

" The year under review is deemed unusually prosperous from every angle. The financial support was the largest ever attained, and it was accompanied by increases in buildings and other permanent equipment and facilities aggregating in value over \$1,500,000 (equalling Rs 5,000,000 nearly). The personnel was enlarged by fully 200 members ".

. In 1928, the total Federal contribution for the work of experiment stations alone is reported to be \$3,360,000 and that from other sources such as States, etc., \$11,442,773—a total of nearly 15 million dollars.

[It may not be out of place to point out that the amounts voted for agriculture in India in the Assembly and in the local Provincial Councils—all put together—do not compare favourably with the figures given above.—Ed. M. A. J.]

The Malayan Agricultural Journal

From January 30, the *Malayan Agricultural Journal* has begun to appear in an enlarged form. The size of the publication is bigger ; the journal will include, in addition to original articles, reviews and abstracts from foreign publications and editorial comments on them ; and the original articles will as far as possible be couched in non-technical terms and include contributions also from allied Departments such as that of Co-operation and the Rubber Research Institute. The publication of strictly technical work will, we understand, be undertaken in future in the form of Special Bulletins. The Editorial Staff of the Journal trust that in its new form it will enter upon an increased sphere of utility and we heartily wish them success in their endeavours.

Lectures on Probable Error

A course of three lectures under the auspices of the Madras University, on 'The Mathematical Probable Error as applicable to Field Experiments in Agriculture' was delivered at the Agricultural College, Coimbatore, by Prof. M. Vaidyanatha Aiyar, M.A., L.T., Hon. Reader of the Madras University, commencing from the 7th March. Almost all the students and a large number of officers, including those from the Imperial Sugarcane Station, attended the lectures. The lectures are published in full in this issue for the benefit of our readers.

"Krishikan"

We note with regret that the *Agriculturist* a monthly Magazine in Tamil, published by our esteemed friend Rao Bahadur J. Chelvaranga Raju from Saidapet, is to be discontinued from next month. We have always felt that the *Agriculturist* has been filling a long-felt want in the Tamilnad and serving the cause of the many non-English-knowing agriculturists by taking the place of our Journal. It is unfortunate that the *Agriculturist* had to be conducted almost at a loss for the last so many months and it is surprising that it should not have had as wide a support as we had expected, being edited by so experienced and able an Agriculturist as our Rao Bahadur. We agree with the publisher when he says that there will be greater and satisfactory support for Journals of this kind when more of our educated men turn their minds to agriculture and perhaps when a larger percentage of the ryots become literate enough to be able to read and write in the vernaculars.

We earnestly hope that the Tamil-knowing Public will not allow such a valuable Journal to lapse for want of mere support. It is up to the subscribers to make the Journal widely known and agree to pay an increased subscription of Rs. 2 per annum and see that the Journal is run as usual and without loss to the publishers.

GLEANINGS

The American Diet

One of the most significant facts of the past 25 years has been the gradual change in the American diet. The amount of food taken is approximately, 1,000 calories less per day than used to be taken. The old diet consisted primarily of meat, potatoes, coffee and sugar whereas it is generally recognised that Americans are eating more fruit and vegetables and that they do pay some attention to the question of vitamins. Dr. Lovell Langstroth of San Francisco tabulated the diets of 501 persons having degenerative diseases, with particular reference to the amount of protective food substances which they ate, and with a view to finding out whether or not changes in the diet could be related to the degenerative diseases. He found that non-protective foods formed 88 per cent. of the average diet. Bread, butter, meat, potatoes and sweet desserts formed the great bulk of the diet of most of the people studied. With the exception of butter and cream which contain considerable amount of the fat-soluble Vitamin A, these diets are vitamin-poor. When the patients were put on a well-balanced diet calculated to provide proper amounts of protective substances, the percentage incidence of degenera-

tive diseases decreased. Thus a diet containing 70 per cent. of protective foods was prescribed in 44 cases of chronic arthritis, 55 cases of chronic gastro-intestinal diseases and 10 cases of migraine. Doctor Langstroth reports that 73 per cent. of these 174 people were improved by the change in diet. There were changes in their body weight, in the appearance and feel of skin and subcutaneous tissue and in the quality and reactions of the mucous membranes.—*Scientific American, Feb. 1930.*

Colds and Roup in Poultry

There are in all probability more losses in the Poultry Yard through the neglect of simple colds, which being left unarrested, develop into roup, than all other diseases combined. Careful observation is absolutely necessary in keeping of Poultry and it will be the observant Poultry keeper who becomes a successful one. It only takes a few minutes to give the birds the necessary attention, and it pays the owner over and over again to keep a constant watch on his stock. Colds are usually on by a chill or a sudden change in the weather. Birds closely confined at night and let out into the chill, damp, morning air, will often take a cold, which if not noticed develops into roup very rapidly.

Prevention is better than cure, and proper ventilation (not draughts) free air by open-fronted houses, plenty of sunlight, ample exercise and sound food of good quality are very important factors. Birds that for any reason are lacking in vitality are always more susceptible to disease of any kind than birds kept under proper conditions. The open-fronted method of poultry housing is the most ideal and perfect system of ventilation. When birds are roosted in such quarters they are practically in the open air and rarely suffer from colds, roups and kindred ailments.

The disease may be easily checked if taken in its early stages and if a careful eye is kept on the stock, immediate action can be taken. The following will be found very useful cures:—One tea spoonful of Paraffin to one quart of the bird's drinking water. One tea spoonful of the following to half a pint of drinking water:—one ounce of Sulphate of Copper dissolved in eight ounces of water. If the heads of affected birds are held in the same amount of the Sulphate of Copper mixture until the bird struggles—about 20-30 seconds—the treatment will be found to have a very wonderful effect.—*Indian Poultry Gazette.*

Phenol Prevents Mould on Leather

It is a common experience to find mould on the surface of leather goods that have been stored away, particularly if the storage place is warm and damp. This tendency has caused no little trouble to shoe manufacturers because the growth occurs on sole leather during the process of manufacture.

In efforts to prevent this nuisance the United States Bureau of Standards Chemists have discovered that if the leather is soaked in a 0.2 per cent. solution of phenol, no mould forms. This simple expedient suggests that phenol or some phenol salt might be used to advantage in dressings for use on leather which is apt to mould in storage or in use, because of high humidity due to climatic or service conditions.—*Scientific American, January 1930.*

Removing Calcium sulphate deposits from Pipes

In hot water containing sulphates, the presence of even a small amount of lime will cause the precipitation of insoluble Calcium sulphate.

When pipe lines or integral parts become sufficiently coated to retard circulation, the removal of the deposit becomes an important problem. Calcium sulphate is not soluble in the usual solvents. Chemists of the United States Bureau of Mines have determined that a hot solution of bicarbonate of Soda will react with Calcium sulphate to form a loose mixture which permits the removal of the bulk of the scales by the current flow of the solutions. The remaining scale is sufficiently changed so that a weak solution of Hydrochloric Acid will completely remove it from the line.—*Scientific American, February 1930.*

A Rapid Method of Testing Viability of Seeds

The usual method of testing whether seeds and grains are alive is to sow them actually and see if they will germinate. This process is necessarily long and tedious. A new test devised by a Russian Botanist—Dr. D. N. Nelubov of Leningrad—will, it is said, give the information in a few hours instead. Dr. Nelubov steeps the seeds in a dilute solution of anilin dyes—the best dye being indigo carmine—at a strength of one-fifth ounce of the dye in one gallon of water, for three to four hours. If the seeds are viable they are not affected by this treatment, while such as are dead get deeply coloured.—*Science, N. S. Vol. LXX, No. 1804.*

The Dairy Heifer

The Dairy Heifer is a unit of the potential milking herd. The breeder who knows how to grow and handle dairy heifers will add substantially to his achievement with his dairy herd.

The demand for reproduction and milk production are so heavy on high producing dairy females that every opportunity must be given for growth and development before the animal begins her lactation period.

Improper feeding and breeding at too early an age are two factors to avoid.

The time to take advantage of the growth impulse is when it is most potent and when demands for milk production do not interfere with its influence.

Do not allow the dairy heifer to get a setback by turning on to scant pasturage or by improper feeding.—*Queensland Agricultural Journal, Feb. 30, p. 110.*

Vitamin Content of Dried Fruits

Fresh fruits and vegetables are known to contain Vitamin C, which is indispensable for the prevention of scurvy, but in view of the danger of scurvy being greater under circumstances when an adequate supply of fresh vegetables and fruits is difficult to obtain, studies in the preservation of foods have been in progress with the object of finding out processes by which the Vitamin C content would be fully maintained. Agnes Fay Morgan and Anna Field of the University of California record the success of their experiments in preserving the Vitamin content of dried fruits by subjecting them to a treatment with sulphur-dioxide gas. Fresh ripe peaches were picked and dried after being cut up. Part of the dried batch was submitted to the action of sulphur dioxide overnight. Feeding experiments were then made using guinea-pigs. The sulphured fruit was found to retain the full Vitamin C content of the fresh fruit, while the unsulphured lot did not show any detectable trace of it. The

sulphured, dried peaches were found to rank with orange juice, raw tomatoes, and other highly potent antiscorbutic foods.—*Science*, Vol. LXX, No. 1803.

Ajinomoto

The Japanese eat much rice and little meat. Such a diet has little energy in it. Hence the Japanese add to their food a substance which has a meat flavour but which is not meat. The use of meat in the diet is condemned by Buddhists and instead, shavings of dried fish are added to Japanese dishes to improve the flavour. The important substance is monosodium glutamate. It is now available in commerce and is said to be as common in Japanese cookery as is salt in American cookery. This substance is called in Japan 'Ajinomoto' or the element of taste. It is reported that it is manufactured by hydrolysing gluten or Soy bean with Hydrochloric or Sulphuric acid.—*Scientific American*, Feb. 1930.

A Poochie Problem

In attacking any problem, it is advisable to be aware of all the factors involved. These are sometimes hidden and unexpected.

A certain South Indian firm, which supplies coffee to Scandinavia among other places, found that their godowns were the abode of a certain insect pest, with the stately name of *Araecerus fasciculatus*, of the ancient family of the Anthribidae—a coffee weevil in fact.

These industrious insects bored through the coffee beans with, as will be seen, commendable patience, leaving a neat tunnel behind them. The firm, far from admiring these activities took steps to circumvent the patient workers, knowing that the final result would be the reduction of the coffee beans to a powder.

Under the guidance of the Agricultural Department special godowns were built to store the beans, where by fumigation, the Entomologist put a stop to the life and work of the *Araecerus fasciculatus*.

So far good. Scandinavia was supplied with a cargo of sound coffee, and the firm turned its attention to other matters. The unexpected factor now emerged. Scandinavia did not like the flavour of the last consignment of coffee, and the agent there begged to be supplied with weevilled beans. Their flavour, it can only be supposed, was found superior to that of ordinary beans.

The problem now facing the firm is to limit the work of the insect to a commercially useful point, and to impart to the coffee bean the desired flavour.—*FEMINA*. Extracted from *Hindu Illustrated Weekly*, March 23, 1930.

Magic Among the Marrows

Marrows are grown in Godavary District as in many other districts. These marrows do not always bear properly, and their owners wish to know why, apart of course from the special malice of local demons, who harass the unlucky cultivator.

One of these latter consulted the local agricultural demonstrator, who visited the marrows when they were in flower. He showed the cultivator how to dust the pollen on to the stigma of the flower—a mere matter of routine to the demonstrator, but to the spectator a manifestation of secret

powers. Anyhow the proceeding resulted in a fine crop of marrows, the flowers having been fertilized.

But in that district the Demonstrator is now a dispenser of magic charms, a bringer of luck. His work is not done. He has still to show that success in farming depends on exact knowledge and industry.

Yet who shall say that there is not magic too? The wonders of plant life and growth have been labelled with botanical terms, but not explained by those names. The mystery and the wonder remain.—FEMINA.

Extracted from the *Hindu Illustrated Weekly*, March 16, 1930.

QUERIES AND ANSWERS

1. Q. Can you tell me the best way to cure broody hens?

A. The best way is to get a box 18 inches cube with an open work bottom which will not allow of the fowl sitting but make her perch all the time. It should be open on all sides and in a cool place but not in any direct draught, preferably in sight of other fowls. Feed sparingly on hard grain and to every pint of drinking water add a pinch of Magnesium sulphate.

2. Q. What is the cure for Chicken-pox in young chickens?

A. Obtain a bottle of *Milton*. Paint all affected parts with this. Isolate each brood that has been attacked. Keep on sweet ground and plenty of fresh drinking water to which has been added Potassium permanganate sufficient to give a slight pink tinge only.

3. Q. Last season, my groundnut crop was infected with hordes of hairy worms which were responsible, I think, for a great reduction in the yield of my crop. Please let me know what I should do to prevent such an attack and loss.

A. The hairy worm referred to is the hairy caterpillar pest commonly attacking groundnut crop defoliating and doing great harm. The most effective methods to prevent the recurrence of the pest are as follows:—(1) After a good shower in May–June employ boys to pick the sluggish moths that may appear in the fields during the evening time. The females of those moths otherwise lay hundreds of eggs which hatch out into hairy caterpillars so harmful to the crop. (2) The fields should be thoroughly ploughed in summer to bring up the underground ‘pupae’ which will be found in large numbers. The pupae when exposed will be devoured by birds. The caterpillars after a certain stage go into the ground and remain there as ‘Pupae’ which look like the seeds of a date fruit, reddish-brown in colour. They look like lifeless objects at this stage, but it is from these harmless looking objects the adult moths emerge after a certain time, when the crop is in the field and are responsible for giving rise to the numerous caterpillars ready to destroy the crop.