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SOME OBSERVATIONS ON RATOONING PADDY.

C. M. JOHN B. A.

Ratooning a paddy crop is scarcely practised. The only locality where paddy is said to be ratooned is in a particular place in the Chingleput district and the special variety grown is "uthiri kar". Whether ratooning paddy is an economic agricultural practice or not, it was thought worth while to study this phase of the paddy crop and the observations were carried on at the Paddy Breeding Station, Coimbatore, during 1924-25 and 1925-26.

Ratooning is found to be due to the proper development of axillary buds at the nodes of the stubbles left after the harvest of the normal-season-tillers. Though the actual stooling of the stubbles is greatly controlled by the time of harvest of the first heads, and other environmental conditions, the development of the buds and the forming of a ratoon crop appears largely to be a varietal character. If a variety with an inherent capacity to ratoon is cut just at the time of ripening, when the straw is still green and the soil moist, and supplemented by a further supply of water, either by irrigation or preferably by rain, then the stubbles of that variety are seen to produce some shoots and ultimately to give some grains. If, however, the same variety is harvested when it is dead ripe, and there is no supply of water or other suitable conditions, the stubbles of that variety do not produce any effective growth. The popular Coimbatore strain G. E. B. 24 has been found to be a good ratooning variety and some of the progenies of

* Paper contributed for the M. A. S. U. Jubilee Conference July 1926.

economic crosses of non ratooning ones with this, were incidentally observed to exhibit the ratooning nature. It is too early to say anything about the inheritance of this capacity to ratoon and it is proposed to watch the progenies of crosses specially from this point and even make some definite crosses, if necessary, to elucidate this.

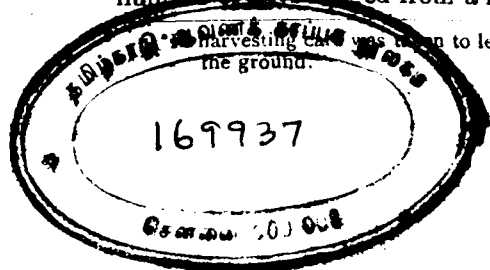
For a detailed observation on ratooning, eight varieties mentioned below and varying in duration, height, size of grain etc., were selected from the pure line cultures of the station. These with their names, native district, duration etc. are given in Table I.

Longer duration varieties could not be included in the study, as it was found from experience that to irrigate them and to keep the soil wet after the months of December and January when the late varieties mature in Coimbatore, and to raise a ratoon crop from them was a practical impossibility. Seedlings from uniform seedbeds of each of the selected varieties were planted in singles, in 5 rows one foot apart with plants 6 inches in the lines, each variety thus forming a block 4 feet wide and 50 feet long, with a 3 feet inter-space between each block. These were put side by side with other pure lots in the order of their duration. Six plants in the central row in each variety chosen for study were duly marked with labels and observations and measurements made on them in detail and the tabulated results are the averages of these 6 plants. When ripe, the plants were harvested individually. And the earheads of each plant were kept separate in paper bags after giving the usual dryings. The stubbles about 4 or 5 inches in height from the ground were allowed to stool and set seed by slightly hoeing the soil all round, and keeping it wet by frequent waterings. The ratoon earheads on ripening were also collected separately and dressed like the normal heads and kept for further study.

Observations made on the normal and ratoon plants of the selected varieties have brought to light some striking differences as shown hereafter.

(i) *Duration*.—The life period of the ratoon crop was observed to be markedly less than that of the normal crop. The number of days ranged from a month to a month and a half, from

harvesting to the time when to leave a stubble with one or two nodes above the ground.



the shooting of these out of-season tillers to the maturing of the grains in the different ratoons. Vide Table I.

(ii) *Height*.—The tillers of 6 plants, both in the normal and ratoon stages were measured on maturity and the latter were observed to be considerably shorter. They were also noted to be with comparatively thin culms, though no regular measurements were done for this. Vide Table I.

(iii) *Length of Panicle and Setting*.—The earheads of the ratoon crops were noted to be considerably shorter than those of the first-stooled tillers and had a greater percentage of unset grains on them. Vide Table I.

Greater amount of unsetting in the ratoon crops has been found to be largely due to the presence of a number of poorly developed anthers which never burst and shed their grains. Even in the developed anther sacs a number of pollen grains were observed when examined under the microscope to be devoid of a good deal of protoplasmic contents. The stigmas were found to be normally receptive in that the healthy pollen grains when artificially dusted on these were able to germinate and send pollen tubes down the styles.

(iv) *Size of Grain*.—Measurements of the length, breadth and thickness of the two sorts of grains showed that the ratoon seeds were very much smaller in size than the main crop seed, the diminution in the lengths being very pronounced. For this grain-size test, 15 grains from each sort were taken at random to represent each plant, and 6 plants to represent each variety. See Table II.

(v) *Weight of grains*.—The size of ratoon grains being definitely smaller, their weights must necessarily be less when compared with the first-harvested seeds. Fifty grains in each kind were carefully weighed in a chemical balance and in all the varieties, the results are true to the expectation. See Table II.

(vi) *Vitality*.—Vitality test of the two sets of grains was also undertaken to see if there is any difference in their germinating capacity. One hundred grains from each sort were kept in an incubator, maintained at a constant temperature, in germination trays and the counts of sprouted seeds taken every day at a fixed time. The results are tabulated in Table III.

From this it is seen that there is practically no great difference in the vitality of the normal and ratoon seeds the total percentage being almost the same. But it exposes another important fact, that the germination of the ratoon grains is prolonged for a number of days, while that of the first gathered seeds takes place within the first two days, a good number sprouting on the first day itself. This shows that the grains of the ratoons lack energy and are not quite so fit for seed purposes.

Having found that the ratoon seed is in every respect poorer than the main crop seed, it will be interesting to find out if any differences would be apparent in the crops raised from the two sorts of seed under the same set of conditions. According to our present day knowledge of heredity, we should not expect to get any great difference but still it is proposed to try this on a small scale next season, as there is a belief in some quarters that the small size acquired in the ratoon crop is maintained in further generations.

In conclusion, I may add that this note is not at all intended to advocate ratooning of paddy as an economic concern but is only the casual recording of the observations of one, who spends most of his time with paddy plants in puddle. To hoe the soil and to keep it wet in a tract experiencing water scarcity even for the normal crop, with a view to raise a ratoon crop is far from economical, the outturn never compensating for the cost. But it has been found in Coimbatore, that it is paying to collect the ratoon grains when that comes off naturally, due to a few summer showers just after harvest. Last season, three women at 4 annas a day, were able to gather at the Paddy Breeding Station, Coimbatore, as much as 82 lbs. of ratoon paddy within the course of the day, though it was not possible to calculate the yield per acre, as it was from a plot grown with character lots, where plants were in lines one foot either way. A fairly good ratoon crop of G. E. B. 24 was also got from the Central Farm wet lands last season. It seems to me that in localities where natural facilities exist, to maintain a paddy crop for a month to a month and a half after the harvest of the normal crop, and where no other economic summer crop could be successfully raised, a ratooning variety may be tried as the last crop and a small income realised by collecting the ratoon grains.

TABLE I.

Variety.	Place of origin	Duration in days 1925-26.	Duration from planting to maturity Normal tillers.	Duration of ratoon tillers.	Height of tillers in feet and inches		Panicle length in cm.	
					Normal	Ratoon	Normal	Ratoon
Jeeraga Samba (T. 298)	Palur	141	111	44	4-5	2-8	26	14
Cluster Paddy (E. B. 331)	Poona	127	97	31	3-0	1-10	19	12
Chalbe Korean (E. B. 377)	China	79	49	27	1-6	1-1	11	8
Raki Pakshi Bhatta (T. 299)	Mysore	121	91	34	4-6	2-5	26	16
Palagummasari (T. 295)	Circars	131	101	39	3-4	1-6	25	18
Dalwa (T. 282)	do.	131	101	41	3-5	2-0	22	15
Khas Pichodi (E. B. 335)	Hyderabad.	115	85	32	3-1	1-5	21	13
Kar (P. S. 3)	Gobichetipalayam	132	101	45	4-8	2-6	23	13

TABLE II.

Variety.	per cent of Setting.	Normal	Ratoon	Measurements in m. m.						Weight in grammes of 50 grains.
				Normal grain			Ratoon grain.			
				{ L B T }			{ L B T }			
				L	B	T	L	B	T	
Jeeraga Samba (T. 298)	86	59	6.0	2.2	1.6	5.4	2.0	1.4	0.47	0.43
Cluster Paddy (E. B. 331)	85	64	7.9	2.8	2.0	6.6	2.5	1.8	1.13	0.69
Chalbe Korean (E. B. 377)	81	56	8.1	3.3	2.2	7.4	3.1	2.1	1.19	1.03
Raki Paksi Bhatta (T. 290)	90	73	8.3	3.0	2.2	7.7	2.8	2.1	1.22	1.06
Palagunasari (T. 295)	92	76	8.5	3.1	2.2	7.4	2.9	2.0	1.36	0.97
Dalwa (T. 282)	92	78	8.5	3.1	2.2	7.6	2.8	2.0	1.33	0.97
Khas Pichodi (E. B. 335)	91	63	8.6	2.1	1.8	7.7	2.0	1.6	0.72	0.53
Kar (P. S. 3)	91	60	8.8	3.3	2.0	8.3	3.1	2.0	1.42	1.09

TABLE III.
VITALITY TEST.

No.	Name.	Number germinated.							Total germinated.	Percent age of germinated.
		1st. doz.	2nd. doz.	3rd.	4th.	5th.	6th.	7th.		
T. 298	Jeeraga samba	96	4	...	...	...	...	...	100	100
„	(do. Ratoon)	58	27	1	9	...	...	...	95	95
E.B. 331	Cluster Paddy	94	5	...	...	...	...	...	99	99
„	(do. Ratoon)	75	18	4	2	...	...	...	99	99
E.B. 377	Chalbe Korean	91	7	...	...	...	...	...	98	98
„	(do. Ratoon)	80	5	8	4	...	...	...	97	97
T. 290	Raki Pakhi Bhatta	80	17	...	...	...	...	...	97	97
„	(do. Ratoon)	62	21	11	2	...	...	...	96	96
T. 295	Palagunasari	94	3	...	...	...	...	...	97	97
„	(do. Ratoon)	77	11	3	7	...	...	...	98	98
T. 282	Dalwa	100	...	...	...	...	...	...	100	100
„	(do. Ratoon)	67	14	12	5	...	...	...	98	98
E.B. 335	Khasi Pichodi	79	19	...	...	...	...	...	98	98
„	(do. Ratoon)	60	20	11	6	...	...	...	97	97
P. S. 3	Kar	98	...	...	...	...	...	...	98	98
„	(do. Ratoon)	91	5	1	1	...	...	...	93	98

CANE CULTIVATION IN KARUR, TRICHINOPOLY DISTRICT.

N. SUBRAMANIAM, L. AG.,

Introduction.—Sugarcane is grown in the villages irrigated by the rivers, Amaravathy and Cauvery in Karur tract. The Reed or the Nanal cane in the Amaravathy and the Buthan or Rasthali in the Cauvery tract are the chief varieties grown in the two tracts. Where the water supply is precarious and intermittent, as in the Amaravathy tract, Nanal cane is preferred, as it is somewhat drought resistant and comes to harvest earlier than the thick cane varieties of the Cauvery tract. In both the tracts cane is grown in wet lands purely with the help of channel water, except in a very limited area where well water supplements the channel for irrigation.

Sugar cane is grown both for seed and milling purposes. There are some villages in the Cauvery tract where cane is grown specially for seed purposes in a particular season, viz., Purattasi-Arpisi (Oct.-Nov.) to meet the demand of cane growers of other villages for planting in Ani-Adi (July-August), and particularly of Kodumudi tract of the Coimbatore district which commands a very large area of cane. The Kodumudi tract is irrigated by the Kalingarayan channel which is closed for a period of three months from April to June and the ryots are not able to grow their canes for seed purposes.

Season :—There are three main seasons for cane planting depending upon (1) water supply in the channel, (2) kind of land selected for cultivation, viz., padugai or non-padugai, (3) purpose for which cane is cultivated. The three main planting seasons are :—

(i) Purattasi—Arpisi (October—November) :—

This season is preferred for growing seed canes to meet the demand of cane growers in Ani pattam; June-July). Canes grown in this season are mostly sold as setts and the portions left over are milled in August. Higher up the Pugalur channel where water supply is assured throughout the year cane for seed purposes is grown in this season.

(ii) Masi (February—March).—

In this season canes are grown chiefly for milling purposes but the demand for seed in October—November is also met from

this crop. This season is preferred for planting in Padugai lands which are liable to be inundated by the Cauvery in July. In Nerur tract, a major portion of the cane area is planted in this season. Cane for milling is also grown here in December—January and this is also sold for seed purposes.

(iii) Ani (June—July.) :—

In villages where water supply is precarious from March to June, planting is done in this season. Reed canes in the Amaravathy tract are planted only in this season.

Cultivation :—There is nothing special in the preparation of the land.

Planting :—Pit and trench methods of planting are prevalent. Setts are cut from whole canes, 7 or 8 months old; 15,000 setts are used for pit planting, and 10,000 to 12,000 for trench planting.

In the case of the Nanal cane of the Amaravathy tract the setts are planted 4 feet to 6 feet apart along the length of a string which is held lengthwise at regular intervals of two feet and when the crop is three months old, the land is laid up into ridges and furrows.

For seed purposes the cane growers are interdependent, the requirements of one season being met from the canes grown in the earlier season either locally or from the adjoining villages. Setts are obtained from the cane growers of Namakkal taluk on the other side of the Cauvery where cane is grown in large areas during the three seasons mentioned above.

Manures and manuring.—Groundnut cake is the only manure applied to the cane crop. This is applied at the rate of 1,000 lb. per acre mostly in a single dose and sometimes in double doses.

The application of leaf manure is not prevalent in the tract though it is very common in the adjoining Kodumudi tract where 3 to 4 cart loads of kolingi leaf are cut into pieces and ploughed into the soil before planting. There the yield of jaggery is greater though the same variety of cane is grown. In the case of padugai lands there is the deposition of fine silt during the Cauvery floods, which invigorates the cane crop a good deal.

Irrigation and drainage.—Great attention is paid for the proper irrigation and drainage of the cane crop. The drying of the cane field greatly reduces the yield besides seriously affecting the colour of the jaggery. This is particularly important in the case of thick cane varieties which are mostly affected by drought conditions. Reed canes, to some extent, withstand drought. Stagnation of water in the cane fields affects the crop a good deal and much care is taken for proper drainage.

Harvesting and milling (a) For seed purposes the canes are harvested when they are $7\frac{1}{2}$ to 8 months old. Whole canes are cut into setts and sold to ryots at Rs. $3\frac{1}{2}$ to 4 per thousand. The charges for cutting are met by the cane growers. The setts for planting are carried to a distance of 12 to 15 miles and even more. For an average crop, $1\frac{1}{2}$ lakhs of setts and a net gain of Rs. 300 per acre are obtained, as detailed below.

Value of produce per acre. ($1\frac{1}{2}$ lakhs of setts at Rs. $3\frac{1}{2}$ per 1000.)	Rs. 525
Harvesting and cutting charges at eightannas per 1000. ...	75
Cultivation expenses per acre. ...	150
Total ...	225
Net gain ...	300

The advantages of selling as setts are.—

(i) Same profit is obtained in both the cases whether sold as setts or jaggery.

(ii) Milling could only be done from the 10th month onwards and will extend to a period of one month. A period of 3 to $3\frac{1}{2}$ months is thus gained when the canes are sold for seed purposes. During this period, a short duration crop of paddy—Aruvathan kuruvai—is taken which adds to the income.

(iii) The seed canes are grown in padugai lands which are inundated in July floods. If left for milling purposes, the canes get spoiled when the inundation lasts for a long period.

(iv) The tedious process of cane milling, the risk of getting bad coloured jaggery, and the consequent reduction in the net gain, are avoided.

(b) *Milling* :—For milling canes are cut from the 10th month onwards. The reed cane is harvested from the 8th month. Harvest and milling of cane are usually done on contract the cultivators being completely freed from the enormous trouble involved in the process of jaggery manufacture. There are special classes of people in this tract and on the other side of the Cauvery who have special knack in this art. They have their own mills, boiling pans and other utensils necessary for jaggery manufacture or they borrow them out from their neighbours for the season. Cattle are purchased for the season and sold away when it is over. The contractors, by themselves, cultivate small areas of cane and when their milling work is over, they take up others' cane for milling on contract. It is of great advantage both to the cultivator and to the contractor. The cultivators are completely relieved of the supervision and trouble while the contractors besides their wages earn a profit of Rs. 3 a day, depending upon the weather conditions and nature of crop taken for milling. With good crops and favourable season a profit of Rs. 5 to 6 a day is also obtained by clever people.

In a day 4 to 5 boilings are taken with 40 to 60 vallams (vallam = 2 Madras measures) of juice per pan. At the rate of 3 to 5 maunds (Maund = 25 lbs.) of jaggery per boiling, 2 pothis (pothi = 250 lbs.) of jaggery per day are obtained. The working expenses per day are.—

Wages for cane cutter	...	...	2	0	0
„ fuel feeder (1 man)	...	...	0	12	0
„ of 2 men engaged in the boiling shed	...	...	1	8	0
„ of one cane feeder and one driver	...	...	0	12	0
„ Wages for stripping canes and carrying to the mill 4 women	...	...	1	0	0
„ Two pairs of cattle	...	...	2	4	0
„ Lime and lubrication, oil charges	...	...	0	4	0
Total. Rs. ...			9	0	0

The contractors are paid at the rate of Rs 6. per pothi of jaggery manufactured and in a day for two pothis, they get Rs 12. and deducting the daily expenses a net gain of Rs 3. is obtained besides daily wages.

Harvesting and milling of reed canes in the Amaravathy tract are done by the cultivators themselves who have their own mills

and other utensils or hire them from their neighbours. Cattle are also hired for the time. Shallow and small pans $3\frac{1}{2}$ to 4' diameter are used. 6 to 8 boilings are taken in a day getting 1 to $1\frac{1}{2}$ pothis of jaggery.

Yield.—The average yield of jaggery per acre near Karur is 25 pothis and in other villages it is only 20 pothis. The yield of reed cane of the Amaravathi tract is poor, being only 10 pothis. Value of the produce per acre is Rs 600. and deducting Rs 270. being the cost of cultivation, a net gain of Rs 330. is obtained.

Ratoon crop.—The practice of taking a ratoon crop of sugar cane is prevalent in some villages. The crops grown in Purattasi-pattam are cut and sown for seed purposes in June and portions of crops left over are milled in July-August. The land is irrigated after clearing it of trash, etc., which are sometimes set fire to. Sprouts come up in a few days and when the crop is grown to some height, the land is hoed and manured with groundnut cake at 500 lbs. per acre. The crop is harvested and milled in March-April. The cultivation expenses are very much lessened and in good season an yield of 15 to 20 pothis of jaggery is obtained per acre. Value of the produce per acre being Rs 375. deducting the cultivation expenses of Rs 150. a gain of Rs 225. is obtained in good season.

Improvements Suggested :—

(1) Minimising cultivation expenses.—

Instead of digging at a contract rate of Rs. 12 to 14 per acre, improved ploughs may be used and thus a saving of Rs. 8 to 10 per acre could be effected by the use, say of monsoon plough.

(2) Adoption of wider planting.—

By the adoption of wider planting of cane a saving of Rs. 15 to Rs. 20 per acre in the cost of setts could be effected besides getting an increased outturn of jaggery.

(3) Green manuring of cane.—

Growing of dhaincha and sunnhemp with the cane crop and trenching it up at the time of hoeing could be conveniently done. The present dose of cake could be reduced by half the quantity when green leaf is applied.

(4) Introduction of improved methods of jaggery manufacture.

The use of the Sindhewahe furnace besides effecting economy of fuel gives better coloured jaggery that fetches higher price.

FODDER PROBLEM IN THE DRY TRACTS OF SOUTH INDIA.*

S. V. DORASAMY AYYAR B.A., B.S.C., (Ag.)

For a superficial observer, the elaboration of such a general subject as this would seem to be subsidiary and unimportant just at present. I mean to say, that we are likely to have uppermost in our minds only the improvement of crop yields and probably that of livestock also, when we think about the Agricultural development of the country. But I need hardly point out that the development of healthy, well built livestock for improved cultivation, is not a little handicapped by inadequate fodder supply in the country. Evidently this subject deserves a more serious attention from us than it has hitherto been given. In a conference like this where representatives from many parts of the Presidency are present, the several aspects of this problem, I believe, may be comprehensively and clearly discussed and constructive suggestions put forward.

When we dive deep into the economics of these dry tracts of South India we are constrained to conclude that this problem of the scarcity in fodder is much more acute often times than the human food problem. Because in seasons of failure of rain and crops, supply of food grains is by some means obtained to tide over the famine period but cattle are either starved to death or fed with anything that is got by way of Palmyrah or Margosa leaves. Such a state of affairs very recently occurred in the heart of this district and it was a very familiar sight for us to see cattle being sold at ridiculously low prices or for practically no price at all.

Even in years of normal rainfall the output of fodder is far below the total quantity required for all the herd kept. We can imagine how the cattle will be kept half or fully starved when rains fail or due to excess of it all the crops fail. Thus owing to the peculiar conditions in the dry tracts and want of facilities the dry farming ryots do not obtain sufficient quantity of fodder even to feed their animals with the bare necessary quantity, much less for stacking to last for the dry season. This is indeed deplorable for we know only too-well what sort of weak and ill-built animals the majority of the ryots possess, and how inefficient such animals prove oftentimes for hard work. The total area put under fodder

crops will be proportionately very little when it is compared with the total area of cultivable dry lands. But according to H. H. Leake there are in the country 45 cattle per 100 of population. As the number of cattle is less in the dry tracts than in places of intensive cultivation we may put this number for the dry tract at about 75 per 100 of population. So, at least according to this proportion there must be about one fourth of the total area under fodder crops, which I believe is not the case.

One cannot therefore sufficiently overrate the importance of this fodder problem. Without strong and well-built cattle agricultural operations cannot be proceeded with efficiently. To attempt to improve the breed of working animals without solving their fodder supply will be to build a structure on a shaky foundation. We want to improve the breed of working animals so that they may cope with the improved methods of cultivation we advocate. We emphatically point out that there must be better cropping, improved yields and greater profits. These undoubtedly depend upon better and effective cultivation. How can this be if the working animals are puny, weak and unsteady? It will be our fault if we do not take steps and explore the possibilities of adequate fodder supply to the cattle population of the vast dry tracts of this province.

In the dry tracts of Coimbatore, Salem and other central districts where rainfall is below 20" cultivation indifferent and generality of ryots poor, the cattle are in the majority of cases very poor. There is very little area sown purely with fodder but what little coarse straw is obtained from the grain crop is always the main supply of fodder. The animals are allowed to graze—exercise would be a better term as some authority puts it—over areas where even a mouthful of grass is not obtained during the greater part of the year. In times of acute scarcity, it is only the few rich ryots that are able to import fodder such as paddp straw from places of availability. The position and circumstances of an average ryot at such a time are indeed pitiable.

In the black soil tract of the far south it is a relief to note that fodder cholam forms usually one of the crops in the rotation. But unfortunately the area is fast diminishing, for the land owner wants to cultivate paying crops as often and as much as possible. So we find many growing cotton and cotton or cumbu and cumbu

successively at the expenses of the area under fodder. In such cases they have to purchase fodder from outside. This state of affairs has to be effectively discouraged. As the rainfall in these tracts averages about 30 inches the problem of growing fodder crops is not so acute. It is only when rains fail or there is an excess of it in the season, there is great difficulty. Apart from this, the seed rate used in these tracts is abnormally heavy. When on the Government Farms by using 20 lbs. an acre, about two tons of fodder—cholam has been obtained, the ryots are able to get only less than a ton of fodder per acre by using such high seed rate as 120 lbs. an acre. His fodder crop is stunted, pale and often dies in patches. This shows how the ryot is indifferent and how he has not sufficiently understood the science of cultivation and the simple principles of economy with reference to the laws of demand and supply—in crop production. The remedy seems to lie in this way also, that of solving the economic and cultural problems of the agricultural population.

Taking up the dry black soil tracts of the Deccan we find that fodder is not usually grown as such. Such vast tracts being under cultivation and the only source of power being bullocks, it is desirable that the ryots should include a fodder crop in the rotation of cropping, at least in as small area as possible. As there is a pair of cattle for every 40 acres in this tract, it may be said that the cattle population is sparse. They are therefore well cared for, being fed on cotton seed, horse gram and sorghum straw. But the availability of straw is limited to the quantity obtained from the grain crop. To improve the breed and to preserve the healthy condition it would seem necessary that a liberal supply of fodder from a fodder crop should be had, as sorghum straw from a fodder crop is undoubtedly much better in quality than that from a grain crop.

An ordinary pair of cattle would require at least 20 lbs. of dry fodder per day—besides some concentrated food as cotton seed and horse-gram. For a year one should therefore have a stock of 7200 lbs. Assuming that green grass, cholam or cumbu straw from the grain crop and green stuff from other grain crops are available for about six months in the year, one should have at least 3600 lbs. of dry fodder for the rest of the period. This will represent an yield of nearly 4 acres in the Black soil under normal conditions and only of 2½ acres when improved cultivation and

cropping are adopted as on the government farms. On the Koilpatti Farm where, on the average 8 pairs of animals, including the breeding stock, are kept, about 20 acres are under fodder cholam every year. The quantity of fodder supplied per pair of cattle is double what I have mentioned above i. e. 40 lbs. per day and this is possible due to the increased yield of fodder obtained nearly double that of what the ordinary ryot gets. From the above we may see that a ryot possessing a pair of working animals should set apart according to his own methods of cultivation, about 4 acres for fodder crop in his cropping scheme, if he should feed his animals well throughout the year. But this is not usually the case and it cannot be said that this is impossible, because in the dry tracts the holdings are fairly big enough to allow such practice to be adopted.

It is thus a case of inadequate fodder supply in the dry tracts of South India which tract forms no mean portion of the whole cultivable area. I have purposely omitted considering the great advantages of good feeding to both working and milking animals. It is well known that a liberal use of fodder gives in return a greatly increased quantity of the valuable farm yard manure, besides, healthy well developed animals fed liberally but judiciously fetch fair prices even when they are old. On the Koilpatti farm, for instance, two pairs were purchased in June 1912 for Rs. 250 and 212 and after working for 8 and 12 years they were sold for Rs. 157 and 182 respectively. The total loss on both the pairs is only Rs. 173 after working them over an average period of ten years. We then come to the clear conclusion that improving the fodder supply for cattle in the dry tracts should take place side by side with that of the breed and the art of cultivation and cropping. "The problem is" as H. H. Leake points out, "fundamentally economic and as is usual in such cases, by no means easy of solution." Those interested in the Agricultural development of these tracts, which are peculiarly cotton areas most of them, should devote their best attention in this direction, having in view the welfare of millions of dumb-driven beings, out of which we demand much in the shape of hard work but give little.

Before concluding I shall attempt to offer some practical suggestions towards solving this fodder problem i. e. to ensure a steady supply of fodder to the dry land cattle, even in the season of drought and scarcity.

1. A fodder crop should be included in the rotation of cropping and the area should be the maximum possible consistent with the number of cattle the ryots possess. Experts and others who have long thought about this question of fodder supply are of opinion that this is the only possible solution. Some may point out the utility of extensive grazing grounds. This has also been proved inadequate. For, the available area is too small for the existing cattle population and any more extension of grazing ground will be at the expense of the cultivated area. I need not point out that the tendency is to include more and more area under cultivation rather than leave anything for grazing purposes. According to calculations under present conditions, it is found that less than an acre of grazing ground will be available for a pair of cattle which is far short of the normal area required. In this connection it is worthwhile going through Mr. Galletti's instructive and interesting remarks about the cattle of India and that of Italy in his writings about Agriculture in India and Italy. He points out how even in a small holding of 4 acres a fodder crop can one can included in the rotation and yet get a good profit from the other crops. His personal experiences deserve our serious study.

2. A larger area than is necessary may be grown with fodder crops on the government farms particularly those in the dry tracts so that the excess may be sold to deserving ryots or stacked for giving relief in times of scarcity during the hot months. I would even suggest that the Government start something like fodder farms where plenty of spring water or other source of water supply is available in the dry tracts and grow suitable fodder crops, ensuring a supply to poor ryots at fair prices. These farms may even be worked on a commercial basis. This is suggested because until the ryots emerge from their present state of poverty, indebtedness and small holdings they will not be in a position to help themselves and the state has the bounden duty to help them in this way.

3. Since an irrigated fodder crop gives an out turn at least 4 times that of a dry one the third suggestion would be to make efforts and induce landowners in areas of plentiful water-supply, to grow fodder crops in as large an area as possible and to make facilities for cheap transport of fodder from these places. What applies to ryots in the dry tracts with regard to the inclusion of a fodder crop in the rotation also applies to those doing garden cultivation. The Government should take steps to materially help in the distribution of fodder over the dry tracts.

THE CATTLE PROBLEM.

MAHATMA GANDHI.

4. The utilisation of some stout xerophytes such as prickly pears, as fodder, at least to tide over the season of drought has long been under investigation. Such investigations may be proceeded with, in the case of the following plants also among others with a view to find their or their products, suitability at least as a famine fodder (1) The Mesquite (*Prosopis Juliflora*) an extremely drought resisting tree which may be tried in the dry tracts of the central districts. If its shoots which are produced in plenty even in the hottest months, are relished by cattle, as some experts point out, these trees may be largely grown in the dry tracts. (2) 'Baisurai' (*Pluchea lanceolata*) a weed of the United Provinces growing in dry wastes. It seems this has got more value as fodder than cholam being more nutritious. (3) Bamboo clumps. As the leaves are much relished by cattle, they may be planted in suitable places and porambokes in tracts where rainfall is comparatively favourable. These may at least save the cattle from utter starvation during the trying times of failure of crops and scarcity.

5. The necessity of reconsidering the levy of a concessional rate of assessment on lands cropped with fodder crops or put down to grass, may be examined and given effect to. There was such a concession in this district sometime back, but it has fallen through on account of stress of circumstances rather than want of enthusiasm on the part of the ryot.

I believe there are many others of ripe experience who may be able to put forward more practical and effective suggestions to solve this problem of adequate fodder supply which is really the foundation for the development of livestock and agriculture. I shall conclude with what a writer in the Times points out viz., 'having regard to the importance of augmenting the resources of the cultivating community, no effort should be spared to find money for irrigation even at the risk of disappointing other heads of administration in the Budget or by levying fresh taxation, the incidence of which should not fall on the Agricultural classes at all.' Therefore the Government should not grudge additional expenditure on irrigation to alleviate fodder distress.

Some months ago the Collector of Ganjam Mr. A. Galletti sent me a sheet, being a reprint of his notes contributed to "The Statesman" in which he gave his opinion based on his Italian experience. (1) that the agriculture of India depended upon good cattle, (2) that the cattle of India were illkept and therefore worse than elsewhere. (3) that they could be improved only by *India growing cattle crops instead of merely depending on common pastures*, and (4) that by the system of rotation, cattle crops could be grown side by side with food grains without diminishing the returns of the latter.

I had difficulty in applying the Italian conditions to the Indian conditions inasmuch as we have such small holdings even as little as two acres and some times even less. To my objection which I conveyed to him, Mr. Galletti sent me the following reply:—

"Many thanks for yours of the 26th February, received to-day in my camp in my Agency hills. I will reply to your objection from experience.

A PRACTICAL EXAMPLE.

"*Small holdings* :—My father had 11 farms, the largest 48 hectares odd, the smallest 1·7 hectares, or say 120 acres and 4 acres. The 4 acre farm was rotated precisely in the same way as the 120 acre farm; 1 acre wheat, 1 acre maize, 2 acres fodder in turn; and this is the point I make in answer to you. Even small holdings can and must be rotated. Our small ryot kept only one pair of bullocks but fed them with the utmost care. He managed to live with his wife and two or three young children on his 4 acres of dry land. He lived in rude comfort because, as my father used to say, his little farm was a garden, every inch fertilised by his sweat, which is the best manure. He had his little kitchen garden, he had his olive trees, he had mulberry trees on the fields with vines creeping up them; he had fig and cherry trees. His wife spun and wove his clothes in the winter and kept silk worms in the summer. He had some bee hives and in the off-season would take his bandy and bullocks out on hire. He kept sheep and pigs and fowls.

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"The 120 acre farm was run by a joint family of 4 brothers with their wives and children and elders; altogether between 40 and 50 persons. It was 30 times as large. But it did not use 30 pairs of bullocks instead of one. It had only 8 pairs of bullocks. It did not put 30 times as much manure and 30 times as much sweat into the land. It did not produce 30 times as much wheat or maize or fodder or hand-spun yarn or cloths. I know what the produce of each of these farms was for about 20 years. We keep accurate accounts because we share everything, down to the eggs and fruit and cloths, equally with our ryots (though out of our half-share we pay the heavy taxes, repairs to house and farm buildings and half the cost price of cattle, implements and chemical manures). On my father's death, I had to sell and I worked out the net average value of each farm to us and multiplied by 25 to get the selling price of the 120 acre farm 60,000, lire and of the 4 acre farm at 6,000. Therefore the small farm had been yielding us three times as much an acre as the 120 acre farm. These price figures imply net incomes of 2,400 and 240 lire to the owner. The ryot's share is not subject to the heavy deductions for taxes and repairs and is actually rather more than twice as much. So the four acre ryot made some 600 lire out of his farm and then there were the profits on silk-worms, hire of bandy and spinning and weaving. Probably his income was 900 lire which is Rs. 600 or Rs. 50 a month. The land is ordinary clay on a hill-slope 1,000 feet above the sea and only valuable because labour of man and beast has made it so.

WHAT THE INDIAN SMALL HOLDER SHOULD DO.

"Let your small holder in India put his sweat and that of really good cattle into the land; let him keep silk-worms, go out on hire with his bandy, keep a kitchen-garden and fruit-trees, and spin and weave; and keep half his land for fodder for his cattle, and he will prosper and his cattle will thrive. If the holding is even smaller than 4 acres and in little pieces here and there, it is wrong for him to keep half-starved cattle at all. Let him work his land with the hoe instead of the plough, as the Japanese do.

"My whole point is that if he keeps cattle at all, he must keep them as he does his own children and see that they have their food daily and he cannot do this unless he keeps half his land at least, but better three fifths, to grow fodder, and when he next

plants a cereal where the fodder grew, he will find it yields three times as much and he will not diminish human food by reducing the area he grows it on; he will increase the amount of human food.

"Indian poverty does not stand in the way of rotation of crops. Rotated crops require no more expenditure of money than staple crops. In Java, the Dutch forced paddy rotation on the people a century ago by the Sjambox. The population of Java has increased from 2 million to 30 million during their rule and the yield of the rice and sugar fields has increased proportionately. The change was brought about not by capital expenditure but by an intelligent Government using force. In India there is no question of using a Sjambox to drive in ideas and make people work. We wish to convince not compel. Here my hope is that the directing class will undertake the work of persuading the people and that you the spiritual director of the directing class, will be the first to put your hand to the plough. Your support will make all the difference. 10 crores of cattle are mutely appealing to you."

The appeal of the crores of India's cattle lies not to me alone, but to every Indian who can think for himself, more especially perhaps to every Hindu who prides himself on being the special protector of the cow. I hope that the readers have been perusing the carefully prepared notes by Sjt. V. G. Dasai on the slaughter of India's cattle. They give a graphic description of the condition of the cattle in the cities of India. Mr. Galletti paints the condition of farm cattle and prescribes in detail the remedy for improving them. The question of improving the breed of cattle and preserving them is a question as well of first rate economics as of religion. How far Mr. Galletti's remedy is applicable to Indian conditions, I do not know. Practical farmers alone can give an authoritative opinion. But one difficulty is obvious. Millions of farmers are too ignorant to adopt new and revolutionary methods. Assuming the truth of Mr. Galletti's prescription its application depends upon the agricultural education of the large mass of Indian humanity. But those who know anything of agriculture and who have a patch of land under cultivation should try Mr. Galletti's remedy and publish results. For such, I give below the relevant extracts from sheet sent by Mr. Galletti,—

We irrigate the meadow in Lombardy as the paddy-field. We still keep there bullocks strong to the plough and cows that yield 1000 seers of milk a month. We sow fodder crops for them by the hand. We devote half our land by rotation to pasture for them.

"When paddy was first introduced and grew year after year in the same fields, the cattle had to be driven away to the hills in the summer, which is our season there for the growing of paddy. But sowing paddy year after year in the same fields has been given up long ago. Rotation paddy-fields are far more productive than the staple fields,' says an Italian text-book, 'and their productive capacity is great in proportion to their freshness."

"If paddy is only grown one year in three or two years in five, divide up your paddy land into three parts or five parts and each year using two-thirds or three-fifths of your land for other crops, mostly grass: lucerne which cattle eat, or oats, which are also only cattle food in Italy. The greater part of your paddy land will accordingly be producing all the time food for your cattle and it is no wonder that the Lombard ploughing bullock is a sleek, well-fed animal four times the weight of the little starved abortions used in India, and the average Lombard cow yields, I am afraid to say how many times as much milk of better quality than the Indian. When I went over the paddy farm of Cav Stabilini near Milan not long ago, it was his cows that he was most anxious to show me and he told me that he made much more by his paddy. He sends his milk, his butter, his cream, his cheese into Milan. The paddy farmer of Bengal has no milk or cream or butter or ghee to send into the great market of Calcutta, which would so willingly pay him high prices for pure products of the cow. Cav Stabilini's cows not only have beautiful meadows and lucerne and clover hay made for them and corn but palatial stable and all the latest appliance for cleaning and milking. Where the cow is a valuable possession, she is tended with care and love, and crops are grown for her and places are built for her. Here she is merely an object of veneration; she is left to stand and starve in the public standing and starving grounds which are mis-called grazing grounds in India. India should abolish these places of torture and breeding grounds of disease and every Indian should devote three-fifths or two thirds of his land to growing grass and fodder for his cattle.

"I assure him he will not be a loser. Apart from the fact that the milk-crop, at any rate near large centres of population is more valuable than the paddy-crop and better food, rotated and manured paddy will yield him two or three times as much as the unrotated and unmanured. I do not think the soil or climate of Lombardy is superior or even equal to those of the Deltas of the Ganges, the Godaveri, the Kistna or the Cauvery for paddy-growing. The season in Lombardy when it is hot enough is so short that it is with difficulty they can scramble out one crop a year. But what are the figures for the yield? The official figure for the average yield in North Italy is 44 quintals a hectare equal to $4\frac{1}{2}$ tons, *i. e.*, nearly two tons per acre. The official figure for most parts of India is well below 1,500 lbs. an acre. In my own district of Ganjam, where one million acres are cultivated and there is nothing to be seen but paddy, the yield is about 1,200 lbs. If we reduce the average to 4,00,000 acres taken in rotation and manured properly and weeded properly as they do in Italy, and get a yield of 4,000 lbs. an acre instead of 1,200, the 400,000 acres would yield one third more paddy than the million acres do now, and we shall have in hand 600,000 acres on which to raise crops of grass and fodder for the cattle or wheat or maize and other crops for men.

"If the Indian visitor goes to Ravenna—a place well worth visiting for itself,—let him also study the paddy growth at the mouth of the river there. It is a country of fine cattle and good pasturage and the chief crop he will see is lucerne. Paddy is grown not so much for its value as because it is the only suitable crop pending the silting up of the soil: when the soil has risen sufficiently: wheat takes the place of paddy. The common rotation there is 2 years paddy, then 2 to 5 years lucerne, so that $\frac{5}{7}$ ths of an estate may be under fodder and only $\frac{2}{7}$ ths under paddy. Indian conditions are very nearly reproduced there; the flat swampy country is not unlike Bengal; paddy is not cultivated with care or much manured and made to yield much; but even there though the population is thick and men must eat, more land is devoted to food for cattle than to food for men; and there too the cattle put all Indian cattle to shame.

"The Indian is not cruel to his cattle, but very, very callous. He will not give up one inch of his land to them. He wants it all for himself. He will only stall-feed a very few and leaves the rest

to multiply without limit and then to starve down to the limit that the public pastures can sustain. He takes no thought for what they will do in the hot weather when there is not even the scanty grass of the public pasture and the rocky hills and never dreams of cutting grass and making a haystack. In India we have only the straw-stack, stuff fit for cattle to sleep on but not to eat. Let the Indian visitor look about him in Europe. He will find every farmhouse encircled by as many hay-stacks as straw-stacks.

"The Italian peasant lives in a joint family with his brothers like the Indian and is much attached to his brother, and will greatly lament if his brother dies, but far more if his ox dies. Such is the high estimation of cattle in a country where the bullock is the mainstay of the house though the cow is no object of religious veneration. Let the Indian visitor to Italy learn to appreciate the feeling of the Italian ryot towards the pious ox whom the mild Virgil loved and he will come back to India and found a Cattle Protection Society, no longer to save the Hindu sacred cow from the Muhammadan butcher, but to protect all cattle against the heartless neglect and unconscious cruelty of the East."

CREDIT SERVICES IN THE DUTCH EAST INDIES.

Paddy Granaries :—These began in 1890. The highest total was reached in 1917, viz., 10,858, but in 1924 the total was only 6,864.

These granaries are generally recognised as being prosperous and whereas the number is falling the total business is increasing. To cover costs of administration an average of interest around 25 per cent must be imposed and great precautions are necessary in the initial stages as many mistakes were made at the commencement by administrative officers in opening granaries where they were neither required nor likely to be of use. The granaries were constructed at the expense of a limited number of shareholders and the rate of interest was fixed at 50 per cent until they were paid out. This took usually about 5—6 years and then interest was lowered to 25 per cent and the granary became communal.

A granary is allowed to make loans at the rate of 3 bushels of paddy per acre. They are opened once every week or once every two weeks during seed and harvest time. A granary is constructed in wood—either bamboo or teak and costs between 300–700 guilders. Stone or cement is not satisfactory as paddy does not keep well in such buildings. It consists of two rooms which are provided with double locks, the Mayor having the key of one and the Secretary the key of the other.

Loans are usually for 6 months and are repayable with interest within one month after completion of the harvest. These granaries are managed by a Commission of three members and they receive 5 per cent of the paddy brought to the granary as payment. 20 per cent is required to meet the salary of the Secretary, the controller and for repairs.

The control of these granaries is carried out by the Credit Service by means of controllers working under European Sub-Inspector. Each controller has charge of 50 granaries and 20 village banks. For such a group a payment of 800 guilders per annum has to be contributed towards the pay of the Inspectors and Sub-Inspectors and a payment of 1,000 guilders per annum as the salary of the controller. These charges are calculated on a percentage basis upon the loans of paddy in the case of granaries and of money in the case of banks.

Communal Banks. These are of two kinds—agricultural and commercial. They were begun in 1900 and marked the second step, viz., the institution of agricultural credit. The agricultural bank is managed by a Commission like the granary and issues loans about twice a year. They prepare a credit sheet which is checked and approved by Village Committee and this is then deposited with the Provincial bank. The cultivators requiring loans submit their requests to the Commission of Management and these if approved are sent via the controller and the Sub-Inspector to the Provincial Bank. If these demands are accepted as reasonable one of the members of the management is authorised to fetch the money and this is then distributed, receipts being taken from each recipient in a special register. The interest charges are in general 12 per cent.

These banks issue loans once or twice a year and loans are given for periods which correspond with the cultural periods of the crops. For paddy it is usually 7–8 months duration. For coconuts, tea, coffee, rubber etc., credit is estimated on the number of trees and repayments are required to be made monthly. Loans are usually limited and are generally 20 guilders per acre of rice, 65 guilders per acre of tobacco, sugarcane etc.

These banks receive deposits including fund from the Village Committee and obtain loans from Provincial Banks on which they pay 6–9 per cent per annum. These communal agricultural banks numbered 3,735 in 1924. The Commission of Management receives remuneration for its services and these banks afford a source of income not to be deposited in addition to providing employment for a number of secretaries.

The Commercial banks are also administered by Commissions of three members in the same manner as granaries or agricultural banks. They are opened once a week on fixed days and for fixed hours. They each have a safe and a secretary has charge of 6 as a general rule. They are authorised to lend for petty trade up to 50 guilders per person, but as a rule this maximum does not exceed 25 guilders and averages between 6 and 12 guilders. The loan is given for 10 weeks at 10 per cent interest. Repayments with interest have to be made every week. In some banks it has been found possible after a time to reduce interest to 5 per cent. The funds of these banks are obtained in a manner similar to that of agricultural banks viz., from the Provincial Bank.

Provincial Banks. One such bank has been established in each administrative district and at the beginning Government met all the expenses and provided them direct credit. In 1913 a change was made. These banks are incorporated but are without shareholders. They receive their capital as follows :—

1. Deposits for 6-12 months at 5 per cent per annum.
2. Deposits withdrawable at sight at 4 per cent per annum.
3. Current accounts of Village committees, granaries, communal banks, public or private institutions, corporations, etc., at 2-4 per cent.
4. Loans from the Apex banks at 5 per cent per annum.

These banks open every day. They are authorised to issue loans to individuals but only grant short time loans. These loans are usually for one year to cultivators and for 20 months for commercial undertakings. The maximum period for any loan is 3 years.

These banks are each managed by a Board of 7 members of whom three only are Government members. Interest on loans issued by these banks ranges from 9–12 per cent and the Government has the power if they are not run well to enforce incometax, which otherwise is remitted, and to withhold through the Apex Bank finance.

It is reported that there is a danger of Directors lending to individuals rather than to communal banks. Experience has clearly shown that communal banks cannot develop without centralised finance to assist them and provincial banks in certain areas are not assisting as far as could have been hoped for. There were 70 Provincial banks in Java and 10 in Sumatra in 1914.

Apex Banks. This bank is designed to supply Provincial banks with capital, to secure opportunities for the investment of their funds and to assist in their management. Control is in the hands of a Board of Directors of 5 members presided over by the Director of the Bank of Java. The control of provincial banks is vested in Inspectors in Batavia and sub-inspectors in the districts.

The Apex bank assists in the audit of accounts of provincial banks and lends only to those which are well run. It charges 5 per cent interest on loans and allows 3 per cent on current accounts and 4 per cent on deposits.

Its capital was 2,875,250 guilders carrying interest to Government at 3 to 3½ per cent and an advance without interest of 732,163 guilders.

The Board of Management in 1925 consisted of the Director of the Bank of Java, the Inspector of rural affairs, the Director of the Dutch Indies Banking Corporation and a member of the Board of the Indies Bank.

The tariff of control of Provincial banks for 1925 was 2.5 per cent for the first 500'000 guilders lent by the Apex Bank and of the nominal capital of the controlled bank 2 per cent for the second 500,000 guilders and 1.1. per cent for the third 500,000 guilders. Deposits are exempted from this charge.

(Extract from the *precis* of a report by M. Y. Henry, Inspector-General of Agriculture, Indo-China, published in the *Tropical Agriculturist* for January 1927.)

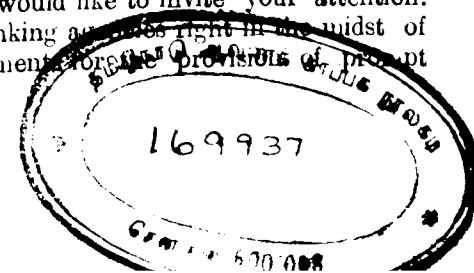
MADRAS PROVINCIAL CO-OPERATIVE CONFERENCE PRESIDENTIAL ADDRESS.

BY SIR. LALLUBHAI SAMALDASS. Kt. C. I. E.

Agricultural Finance. It is necessary to realise that success in the sphere of agricultural finance is difficult if not impossible, of achievement without the establishment of close and constant touch between borrower and lender. The touch that exists, at present, between the primary society and its members and which forms the basis of our co-operative credit system will not, I fear, suffice for the success that I have in view, because in your Presidency and in other parts of India, the primary society is scarcely a self-contained unit; it depends very largely for its resources on capital borrowed from Central Banks specifically started for this purpose. The proportion to the owned capital that these funds derived from outside bear varies from province to province, and in your Presidency the figure is so high as over 75 per cent. If the owned capital is only 20 per cent of the total resources, as it is for primary agricultural credit societies in Madras, one can hardly expect them to evince any very highly developed sense of financial responsibility, and if indiscriminate advances are made, recalcitrancy develops and as a result recoveries dry up, the princi-

pal suffers financially i.e., the agency that provides the bulk of the capital. The acceptance of this line of thought has led co-operators in Bombay to the conclusion that, in the interest of the movement itself, it is necessary to place on Central Banks a certain amount of responsibility for the inspection of primary societies affiliated to them. All the banks are expected to maintain a paid field staff for inspection whose duty it is to assess the credits of constituent societies, to check if loans have been disbursed in accordance with normal credits fixed at general meetings, to inquire into applications for extension of periods of loans and, where necessary, to stimulate recoveries. Through this inspecting staff which is paid by and, I may emphasise, is directly responsible to Central Banks, a fairly intimate and organic contact has been established between primary societies as borrowers and Central Banks as lenders and the effect of this closer relationship is easily noticeable in recoveries and in the improvement of the tone of management. Despite a not too favourable season and a fall in the prices of agricultural produce, the proportion of recoveries to demand actually went up in Bombay during the year 1925-26. You have in this Presidency tried various methods of establishing contact between Central Banks and primary societies and securing inspection of affairs from the financial point of view. You utilized for the first few years the agency of the Co-operative Department for this kind of work which system has been given up because it really formed no part of the Registrar's statutory duties; for sometime you attempted to deal direct through supervising unions, but perhaps you were not successful in evoking response in the shape of responsible control. Now you are trying to get some kind of touch through the rather complicated machinery of district federations. Both as a student of co-operation and as a practical man of business, I am, however, inclined to uphold the conclusions at which co-operative workers in Bombay arrived some years ago, and I desire to place these before you for your consideration and acceptance, if they meet with your approval.

Bombay Experiences:—One of the methods adopted by us for the establishment of a living touch in agricultural finance is the maintenance, right in the midst of the people, of a field staff by Central Banks for the work of inspection. There is another equally interesting method to which I would like to invite your attention. That method is to establish banking agencies right in the midst of the people, organising arrangements for the provision of prompt



finance, and making the banks more easily accessible to the members of societies. This line of action may not be necessary where the primary societies themselves serve as village banks, but the position being what it is to-day, part of the services performed elsewhere by the primary societies themselves have to be entrusted to agencies one stage higher up in the co-operative structure. With branches of banks opened out at taluka headquarters, it becomes possible for the central financing agencies to get acquainted with the needs and difficulties of the members of primary societies, financed by them, an acquaintance which conduces to relax the apparent rigidity of the co-operative system of finance, makes it more human and elastic and inspires in the minds of the agriculturists a growing sense of confidence. In your Presidency, you have 31 Central Banks to serve 24 districts, you have more banks than one, while apart from the City Branch of the Madras Central Urban Bank, I do not believe there are any branch banks in this presidency. I am aware that the opinion on this side of India seems to be in favour of accepting the district as the unit for the starting of central financing agencies, but even if this view is to prevail, there is no reason why your district banks should not establish means of contact with primary societies, affiliated to them, by the opening of branches in taluka centres where there are compact groups of primary societies. Our experience at the Provincial Bank in Bombay convinces me that the additional expenditure, that is incurred in opening branches, is more than recouped in a few years' time by expansion of business, by increase in the fluidity of the investments, and above all, by the creation of a feeling of assurance among the rural population.

There is one more lesson from my experience of Bombay to which I may invite your attention. It is now recognized as almost an axiomatic truth that in India the problem of agricultural supply and marketing are closely linked together and no solution of the one is possible which fails to attend to the other. A distinguished economist from your Presidency, Dr. John Mathai, gave expression to similar views, some years ago. That identically is also the conclusion to which our observation and our experience have led us in Bombay. Agricultural finance, till very recent times, was not conducted on a cash basis, and most of the advances were made in kind and repayments also were, as a rule, made from produce. The effect of this system was that a direct check was imposed on the use of loans, recoveries were facilitated, and a basis was available for gauging the repaying capacity of the

borrower. When we have the borrower systematically educated in the proper use of credit, when our machinery for assessment of credit worthiness is well developed, and habits of punctuality are thoroughly imbibed, we may well dispense with these useful features of the system of rural credit we have attempted to supplant. But till that stage is reached, I strongly hold that the functions of credit, and supply should be closely interlinked even though separate organisations be found necessary for the performance of these services, there should be a systematic co-ordination in the working of these different agencies.

Land Mortgage Banks:—There is one aspect of the problem of agricultural finance which I have not touched so far and to which I would now like to turn. We have attempted till lately to provide through our co-operative credit organization, both short term and long term credit, and have consequently been unable to perfect our machinery for either. In most countries, there are two separate organisations for the two types of services, and I am glad that Madras was one of the first provinces in India to recognise the importance of having an entirely distinct organisation for long term land mortgage credit. I also embrace this opportunity of congratulating on behalf of co-operators all over India my friend, the Hon. Mr. Ramadas Pantulu, on his success in getting the Council of State to agree to a resolution, calling upon Government to take early steps for the provision of arrangements for land mortgage banks in different provinces. Various proposals for the type of organisation required are being put forward from different students of the movement in different provinces, but in view of the pronouncement made by the Hon'ble Sir Mahomed Habibullah in the Council of State, it is unlikely that any Local Government will embark upon any definite line of action until the recommendations of the Royal Commission on Agriculture in India have been published. There appears, however, to be general agreement about a few points and in order to clarify our ideas on the subject it is to these points, rather than to detailed arrangements, that I should like to draw your attention. The first of these points of general agreement is that even those among us who want a distinct organisation for land mortgage credit, insist that the organization should be co-operative in its constitution and working and not a centralized purely capitalist body like the Agricultural Bank of Egypt dealing with individuals direct. Next in importance is the universal acceptance of the need for State aid in any scheme for long

term credit. There is general agreement that the most suitable form in which this assistance can be given would be the recognition of the mortgage bonds issued by banks as trustee securities and the guaranteeing by Government of the payment of interest on the debentures till maturity. Opinion is not unanimous about the subscription by the State to the share capital of the mortgage banks and the purchase of the initial issues of debentures. Nor is opinion unanimous whether the smaller land mortgage banks in the district should be empowered to issue debentures or whether, as my friend the Hon'ble Mr. Ramadas seems to suggest and the Conferences of Registrars and Provincial Banks held in 1926 resolved, this responsible work should be entrusted to a central organisation in every province. I am personally inclined to favour the latter view, first because of the practical difficulty any Government will feel in guaranteeing the liabilities of a number of small institutions and secondly because the needs of your province, as well as mine, in respect of long term credit are so vast that we want a strong efficient apex institution to obtain for the agriculturist finance from the money market on the most favourable terms possible. It will be necessary to establish, touch with the Reserve Bank of India if it comes into being, and also with the Imperial Bank of India, and a strong central body can do this better than a number of units scattered all over the presidency.

Co-operative Finance under New Proposals:—This leads me to the very important question of the place of co-operative finance, in the new banking regime to be inaugurated under the aegis of the proposed Reserve Bank of India. The banking operations of Government will henceforth be entrusted to this so-called Central Bank which again will function through the Imperial Bank and its branches. It is very difficult to say what effect this change in banking organisation will have upon the relations already established between co-operative banks and the Imperial Bank as bankers for the State. The Imperial Bank will function in future as agents of the Reserve Bank, and as they will not own any direct responsibility to Government they may curtail and even suspend the facilities which, after years of persistent effort, co-operative banks have been able to secure from them. This applies to the grant both of financial accommodation and of facilities in the matter of transfer of funds. There is yet another point to which I should like to refer. Government appear to be still under the impression that the sole agency for the deve-

lopment of the banking habit, all over the country, is the Imperial Bank of India, forgetting that nearly four-fifths of the country's population live in villages, which can never be reached by any extension of the activities of the Imperial Bank and the opening of its branches. The only approach to this vast population lies through the agency of co-operative banks, but co-operative banks, located at district headquarters, will be nearly as difficult of access as branches of the Imperial Bank of India. It is for this reason, too, that I would plead again for a policy of opening branch banks for if we do it now at our own risk and cost, we shall later on have as great a claim on some measure of support from the State as the Imperial Bank is putting forward today.

Of the resolutions passed one related to Land Mortgage Banks. This was moved by the Hon'ble Mr. V. Ramadas Pantulu and was in these terms.

This Conference is of opinion that until a suitable scheme is evolved, more primary Land Mortgage Banks of the existing type, introduced by the Government, be started and that a Land Mortgage Central Financing Bank be established at Madras composed of the said primary banks and other co-operative societies as well as individual shareholders;

(2) The capital of the bank shall be 3 lakhs of rupees of which individuals shall be allotted shares to the value not exceeding 50 per cent of the total number.

(3) The borrowing power of the bank shall be 25 times the paid-up share capital and the reserve fund.

(4) The debentures shall issue on the security of the bonds of mortgage of immovable property to the full value of the interests of co-operative societies in such bonds.

(5) The period of debentures shall be 25 to 30 years.

(6) The debenture shares get extinguished as collections get in, the absence of safe investments such as investments in central financing banks for short periods without loss of interest and so as to be within the competence of the central bank to repay within the specified period:

(7) The rate of interest on debentures shall not exceed 6 per cent and the lending rate to societies shall not exceed 7 per cent and the lending rate by the societies shall not exceed 8 per cent.

(8) The period for which mortgage loan may be given shall be 20 or 30 years.

(9) Dividend and share capital shall not exceed $7\frac{1}{2}$ per cent during the first 6 years and shall not exceed 5 per cent thereafter.

(10) The central financing bank shall not lend to any one except to a co-operative society.

(11) The primary banks shall not receive short term deposits.

(12) The primary banks shall not lend more than 40 per cent of the market value of the securities.

(13) Management to vest in the provincial bank.

A committee consisting of Messrs. A. Vedachala Aiyar, Deivasiganani Mudaliar, Dewan Bahadur R. Ramachandra Row and Hon'ble Mr. V. Ramadas Pantulu was appointed to draft suitable bye-laws of the Financing Bank in contemplation, after consultation with the Registrar of Co-operative Societies.

Mr. A. Vedachala Aiyar who seconded the motion pointed out that the Committee appointed by this resolution was not expected to submit any report to the next Conference, but was expected to start and work the bank.

The President in putting the resolution to vote said that the scheme had his full support. The resolution was then carried unanimously.

DEPARTMENTS WORK IN JANUARY—OFFICIAL DIGEST NO. 55.

Weather.—January was characterized by dry weather except in the first week when local rains were received in Tanjore and Tinnevely.

Irrigation. Supplies in rainfed tanks and in river channels except in the Godavari and the Kistna were generally inadequate. Some tanks dried up.

Insufficient rainfall in the north-east monsoon adversely affected standing crops. The worst affected parts were the black-soil areas of Bellary and Anantapur and the Ongole taluk of Guntur.

Activities:—Waltair Circle:—It was found that in some places G. E. B. 24 Paddy gave good results and green manuring had raised the yield by as much as 24 per cent. At the Samalkota station cane harvest was begun with Purple Mauritius. Some canes weighed up to 11 lbs. each. Demonstration of plantain gave useful results. Within seven months of planting 87 per cent of Chakrakeli, 77 per cent of Bontha, and 83 per cent of Mauritius had bunched.

Guntur Circle:—Prospects of raising a second crop paddy in Nellore were small owing to scarcity of water in tanks. Fodder was scarce and cattle were being moved in large numbers to the Deltaic tracts. Co 3 paddy tried for the first time at Pappareddipalem as a drill sown crop gave an acre yield of 2100 lbs. as compared with local vadansamba which gave 1800 lbs grain.

Bellary Circle:—In Bellary and Anantapur, the sorghum (Jonna) crop almost dried up, while cotton was poor but conditions in Kurnool and Cuddappah were a little better.

Madras Circle:—There was not a month's supply of water in the large tanks, the smaller ones were practically dry and water level in wells was low. Paddy harvest was begun and the yield estimated was half the normal. Sugarcane also suffered. Two agricultural exhibitions were held, one at Arkonam and the other at Battavaripalli in the Kangundi Zamindari. At the latter the Imperial Dairy Expert gave a demonstration in buttermaking.

Trichinopoly Circle:—Water supply in the Cauveri was inadequate. No green manure seeds could be sown on account of drought.

At the Aduthurai Paddy Breeding Station, experiments conducted showed that there was no truth in the common belief that ploughing of wet lands in summer adversely affects the yield of

paddy. A Mirasdars' conference was held at the station and was opened by the Hon'ble Mr. A. Ranganatha Mudaliyar, Second Minister. Demonstrations conducted on both crops of paddy by the Mulangudi and Elanthangudi co-operative societies gave results in favour of economic planting, deep ploughing and improved manuring over the corresponding local methods to the extent of Rs. 25 an acre when all improvements were adopted.

Madura Circle:—The long drought which continued affected paddy, fodder and cotton but made itself less noticeable in drilled areas.

West Coast Circle:—The second crop paddy harvest was completed and reduced yields were obtained. Green manure seeds could not be sown owing to there being no moisture in the soil.

G. E. B. 24 paddy matured 15 to 20 days earlier than local varieties. This added to its popularity and created a brisk demand for seed. At the Coconut stations coconuts were found to come into bearing in their 8th year from planting which is earlier than in the case of the local method.

Coimbatore Circle:—There was no rain and water level in wells was low. Harvest of paddy wherever made gave low yields. Three agricultural exhibitions were held, one at Papparapatti, one at Kalipatti and one at Sankari.

Where sulphate of ammonia had been used for sugarcane instead of oilcakes they were found to respond very rapidly and to tiller better.

Cattle Circle:—An outbreak of blackquarter amongst the cattle at Hosur caused anxiety. Inoculation by anti-black quarter serum and aggression, followed by aggression alone ten days later appeared to have stopped the trouble.

The merits of a young Scindh bull No. 115 were made known in that the mother proved a 5000 lbs. cow and the sire 8000 lbs. cow and a sister averaged 6000 lbs.

Stations at Coimbatore:—Trials were made by the Cotton Specialist to determine waste of fodder that occurs when cattle are fed at a conventional basic rate of 15 lbs. a head. Two pairs of work animals, one Nellore and one Kangayam, were fed with

20 lbs. of fodder per head per day and the refuse weighed which was as below:—

Nellore	at work	7 lbs.	at rest	4.3 lbs.
Kangayam	,,	4.5 lbs.	,,	6.5 lbs.

In this case the fodder was cut long by hand and the refuse consisted of stems about a foot long.

When the fodder was next chaffed and the experiment repeated with animals at rest the quantity of refuse came down to $\frac{1}{2}$ lb. with Nellore and one and threefourths lb. with Kangayam. At the Central Farm paddy harvest was over and the acre yields went higher than the quinquennial yields and were 3108 lbs. grain and 4013 lbs straw.

The rains cholam (rainfed) gave an acre yield of 589 lbs. grain.

MR. R. D. ANSTEAD'S ADDRESS TO THE MINISTER.

MR. RANGANATHA MUDALIYAR.

It gives me the very greatest pleasure to welcome you to this Agricultural College on the occasion of your first visit since you have assumed the responsible office of Minister for Development in this Presidency. You have been able to see here two important sides of the work of the Agricultural Department which is under your care. On the one side is the Research work, upon which all demonstrations to ryots must ultimately be based. It is in these laboratories that the fundamental principles underlying agriculture in South India are worked out in all their detail, and it is here that we are able to discover improvements in the local practices adopted by ryots. All this knowledge obtained in these laboratories ultimately gets down to the ryot through the Experiment Stations where any proposed improvement is tested out on a field scale under local conditions and then through the Agricultural Demonstrators. This work is of fundamental importance and without it we should have nothing to demonstrate. Much of the work which you see being done here will, no doubt, take time before it leads to actual improvements which can be adopted by the ryot, but is

none the less important because of that. On the other side, you have been able to see the Teaching work. Here, in this College, are being trained many of the future officers of the Agricultural Department since many of the students who take their degrees at this College are drafted into the ranks of the Agricultural Department both upon the research side and upon the agricultural side as actual demonstrators, so that you see sitting before you now the material which will some day actually come under your care as officers of the Agricultural Department. At the same time, I would remind you that the sole subject of this College is not to train officers for the Agricultural Department. It has another side. It has always been the hope and desire of this College to provide a training in scientific agriculture such as may fit those who undergo it to return to their lands and farm them on up-to-date scientific principles. I regret to say that this side of the work of the Agricultural College has not met with that measure of popularity which I should like to see and far too many students come to this College with the sole object of getting posts in Government service. However, there are notable exceptions and there are a certain number of students of this College who are now farming their own lands on scientific principles and setting an extremely good example. I hope that in the future there will be still more of such students.

You have been good enough, Sir, to consent this evening to present the prizes which have been won by students of this College, and I am sure that the gratification which those students will feel in winning these prizes will be largely added to by receiving them from your hands.

The Robertson Prize is to perpetuate the memory of Mr. W. R. Robertson, at one time Principal of the Agricultural College at Saidapet. It is in the form of a gold medal and is awarded annually to the best student of his year who obtains the highest number of marks in both parts of the examination for the Degree of Bachelor of Science in Agriculture of the Madras University. This year, the prize has been won by T. R. Narayan.

The Clogstoun Prize is to perpetuate the memory of Mr. H. F. Clogstoun, at one time Director of Agriculture in this Presidency. It is in the form of a gold medal and is awarded for the student who shows the best general proficiency throughout the Degree course.

This year, the prize has been won by T. R. Narayan.

The Keess Prize is to perpetuate the memory of Mr. W. Keess, at one time Principal of the College of Agriculture at Saidapet. It is in the form of a gold medal and is awarded to the student who obtained the highest number of marks at his first appearance in the Degree examination in Chemistry and who obtains his Degree in the same session. It is won this year by T. R. Narayan.

The D'Silva Prize is in perpetuation of the memory of Mr. D'Silva who was for several years Veterinary Lecturer both at Saidapet and at Coimbatore.

It is in the form of a gold medal and is awarded each year to the student who obtains the largest number of marks in Animal Hygiene at his first appearance in the examination for the Degree. It is won this year by V. Achuta Wariar.

The Raghunatha Rao Prize is offered by M. R. Ry., Rai Sahib A. Seturama Ayyar of Nidamangalm and is the form of a gold medal and is awarded each year to the student who has shown the most diligence in the practical classes during the course for the agricultural Degree. This year, it has been won by.

In addition to these prizes, I am happy to say that another honour has recently fallen to one of the students of this College. The gold medal offered by His Excellency the Viceroy for an essay on the subject of "Cattle Breeding and Dairying in India" has, it is true, not been won in Madras. It has gone to Bombay; but a student of this College has come out second in the competition. K. Ramanathan has gained this distinction and will, I understand, be awarded a Provincial silver medal. I congratulate the College on this result and I congratulate Ramanathan. I had the privilege of reading his essay and it was of a very high merit. At the same time, I hope that if there is a similar competition next year this College will get the gold medal and not be content with second place.

Once more, Sir I extend to you a very hearty welcome to this Agricultural College and I will ask you to be good enough to present the prizes.

AMERICAN LETTER.

From off Part I:—Sweet Ind.

DEAR FRIENDS,

To an Indian, especially one who has passed middle age, his first sea-trip or for the matter of that, his first journey out of his homeland is no doubt a very remarkable and unique experience. There is all enthusiasm and activity months before he starts, making plans and preparations, building air castles over his future adventures and novel experiences. But as the parting day comes nearer and when the die is definitely cast by booking his passage shelling out a large sum, the individual begins to realize the seriousness of the step he takes and his mind gets considerably upset with all sorts of anxieties and misgivings. At any rate that was my personal experience. The series of farewell parties, several courtesies and parting good wishes from old friends and fellow workers and the painful leave taking from near and dear ones—mother and children—each contributed its own share to disturb my mental poise at the time of leaving, so much so that I begin now even to doubt if I took leave of all friends without exception. I crave pardon of my friends such as I may have unconsciously omitted. I cannot say whether a younger man would have felt alike in my circumstances. Anyway there could be no withdrawal after having purchased my passage and transferred a pretty good sum to a Bank in America.

I left home on the 14th November. The next evening I found myself in the Ceylon ferry boat Danushkoni. As this moved further and further from the Indian shores they became gradually dimmer and dimmer until at last the only land marks—the tower of the famous temple of Lord Ramanadhan at Rameswaram and the towering gopuram—disappeared from our view as we were far out in the sea. When, for the first time in my life, this last link slipped away, I felt considerable pain and became seasick. Conflicting thoughts arose and at the moment came to my mind the old German emigrant's song

“ Oh! how hard it would be to leave the homeland shores
If the hope did not live that soon we shall see them again
Farewell, farewell, until we see you again,”

This consoled me a bit.

In a couple of hours the Ceylon shore was reached and I got into the Colombo Mail amidst rain and the usual pinpricks of the Customs Officer, the Railway servant and the policeman in checking my passports, luggage and ticket. I was at Colombo by 9 A.M. on the 16th. My boat was expected from Europe only on the 17th and I had therefore to wait for a day. This is a very big city, an important Port of Call for passengers and ships from all parts of the Globe and is hence nicknamed “ The Charing Cross of the East ”. It has all the paraphernalia of a busy modern city. What struck me as peculiar was the existence of pawnbrokers' shops almost in every street, mostly owned by our friends from Chettinad. There is a fair sprinkling of members of other Indian communities also in this city. My ship rolled into the harbour late in the evening and it was notified she would leave early in the morning next day. So, armed with my Port Health Certificate I got into my cabin the same night. Mr. S. Antony, one of our old students at Coimbatore who met me and helped me the whole day, left us a parting gift—a nice bottle of sweet Grape juice—which was intended for use in sea sickness.

CURRENT TOPICS.

Plant Quarantine :—Considerable difficulty is felt and acrimonious controversy is set up when restriction is suggested on the importation of plants from foreign countries where diseases are virulent. A note on this subject read by Dr. Walter T. Swingle of Washington, United States before the Pacific Science Congress recently held at Tokyo will be useful.

The method adopted, says the ‘Malayan Agricultural Journal’ for January, is to retain the introduced plants in permanent quarantine in special metallic, isolated, insect free propagating houses, until clean new growth free from all signs of disease is made. Then buds are cut from each clean new growth and grafted on vigorous, clean, young stocks of local origin and after such buds have started and if the new growth proves to be healthy and vigorous the original imported plants are burned together with the pots and soil in which they were grown. The metallic screened cases in which plants had been growing are thoroughly sterilised both by heat and by washing with powerful disinfectants.

Calorific (heat) value of megasse:—Investigations were carried on at the Philippine College of Agriculture, Los Banos, to determine the heat values of several canes. The varieties used were (1) A bud variant of big Tana, (2) Deinerara 1135, (3) Hambleton Queensland 426, (4) Hawaii 20, (5) Hawaii 69, (6) Hawaii 27, (7) Luzon white (8) Malagache, (9) Mindoro purple, (10) Negros purple, (11) New Guinea 40, (12) P. B. No. 42, (13) Uba Cane, (14) A bud variant of Luzon white (15) Tigbao Mestiza, (16) Java 247, (17) P. B. No. 39. Of these 17 varieties, the Uba cane showed the highest fuel value, Tigbao Mestiza and Mindoro purple, the second highest and the Hawaiian canes except H. 69 the lowest. The two most popular varieties—Negros purple and Luzon white gave an average fuel value of 4430 calories per kilogram on the dry basis.

Milk for Infants:—A study of the milk of normal women in the London Royal Free Hospital shows (1) that there appears to be a difference between the milk of *primiparae* and *multiparae* in respect of protein and fat in the early days of lactation, (2) the protein and ash content are very high in *primiparae* and less so in *multiparae* on the 2nd and 3rd days. They fall steadily during the first week to reach an approximately normal level of from 0.38 per cent to 1.3 per cent for the protein and 0.20 per cent to 0.25 per cent for the ash; (3) the sugar content is at its lowest in the early days and rises irregularly to a normal level of approximately 6.5 per cent by the end of the second week. (4) The fat varies according to the physical condition of the breast and actual extraction and not in relation to the day after the parturition but in principle the general behaviour is reversed in the first days of lactation. (5) The calcium content varies up to the 15th day between individual women and (6) the total solids vary roughly as the fat and show a range from 9.6 per cent to 14.98 per cent. (Biochemical Journal, Vol. XII No. 1.

Will this attract the notice of persons interested in the Child-Welfare Scheme?

Molasses as Fuel:—In Hawaii suggestions were made at a recent meeting of the Sugar technologists that considerable amount of molasses available may be mixed with the bagasse and burnt as fuel next year as it is no longer profitable to ship it to America.

Paspalum Dilatatum grass which is propagated by roots is reported by Ralph C. Morris in 'Planters Chronicle' to grow very successfully on Biligiri Rangan Hills (4,000 to 5,000 feet), to remain green all the year round and provide excellent grazing and fodder. The roots are available at the Government Botanical Gardens Ooty at Rs. 5 per 1000 roots.

Agricultural Data of Denmark:—Of Denmark's total area of about 4,302,000 hectares (16,603 square miles or 10,625,940 acres; or size of Tanjore, Madura, Ramnad and Tinnevely) about 76 per cent is utilized for agriculture, and 9 per cent is timbered, while the greater part of the remainder consists of areas which are useless for agriculture and the improved land amounts approximately to 8,091,720 acres. Divided according to the size of the agricultural areas there were in 1919 the following number of farms with an area of 0.55 hectares (1.36 acres)

Area	Number		Agricultural area	
	Total	Per cent.	1000 acres	Per cent.
0.55 to 33	43891	21.3	82	2.5
3.3 to 15	90748	44.1	721	21.8
15 to 60	65916	32.0	1879	56.7
60 to 120	4039	2.0	332	10.0
120 to 240	916	0.4	153	4.6
240 and over	419	0.2	147	4.4
Total ...	205,929	100.0	3,314	100.0

(From University of California Bulletin No. 408.)

Agricultural Research Conference:—An Imperial Agricultural Research conference at which delegates from all over the Empire will be present is to be held in London beginning October 4. The Ministry of Agriculture and Fisheries is responsible for all arrangements in connexion with the conference and the Empire Marketing Board is finding the necessary funds.

International Economic Conference:—On May 4th, will gather at Geneva an economic conference without parallel in history, says 'The World Outlook.' It is not to be composed of responsible delegates invested with full powers for concluding

conventions, but will secure general consultations when various policies, doctrines and programmes will be discussed, defended or exposed with little reserve or restraint and with no necessity of transforming conclusions into international engagements. Herein lies its supreme strength.

The agenda is in two parts :—First Part—The World Economics Positive. Principal features and problems as seen from the point of view of different countries. Analysis of economic causes of the present disturbed equilibrium in commerce and industry. Economic tendencies capable of effecting the peace of the world.

Second Part:—I. Commerce. (1) Liberty of trading (import and export restrictions, monopolisation of trade.) (2) Customs tariff and commercial treaties. (3) Indirect methods of protecting national commerce and shipping (subsidies, dumping) and (4) Repercussion on international commerce of reduced purchasing power,

II. Industry. (1) Situation of principal industries (productive capacity, output, consumption and employment.) (2) Nature of present difficulties in industry, their industrial, commercial and monetary causes. (3) Possibilities of action. (a) Organisation of production by international industrial agreements; (b) Exchange of Statistical information.

III. Agriculture (1) The present position of agriculture compared with prewar conditions (production, consumption, stocks, prices etc) (2) causes of present difficulties, (3) possibilities of international action through (a) producers and consumers (including cooperative organisations); (b) exchange of information, (c) developing purchasing power of agricultural producers.

The unique character of this conference is that only questions of procedure shall be settled by a majority vote, in other cases decisions will not be taken by voting, resolutions being passed unanimously when possible and when not, names of members in favor of a resolution being recorded.

This method of persuasion and of influencing public opinion is a notable departure from hidebound methods of settlement and should find universal acceptance.

There will be three representatives from India.

A Novel State Function:—The United States of America has passed a bill in the Congress to fix the prizes of basic agricultural products as rice, tobacco, wheat, cotton, maize, and swine. President Coolidge however having vetoed it, it goes before the Senate where it should get a two-thirds majority to become law. The bill sets up two bodies one of which is to fix the price of the articles with reference to the prices of other goods of which the farmer is the purchaser. This is to prevent the prices of agricultural commodities falling below a level at which some sort of a living can be obtained. The second body will purchase all the goods offered to Government at the price fixed and Government will export and sell all the surplus outside the States. To meet possible losses and administrative charges, an equalisation fee is to be paid by the farmer who will get back all unspent balance.

Kenya:—This delightful African country which was formerly known as East African Protectorate came under the influence of the British in 1895. Britain, in her own business way, laid the Uganda Railway immediately after to put down slave trading and to open up the interior.

The local government in 1901 proceeded to create a class of landed proprietors; any one might belong to this class provided he or she were not an African. European settlers began to arrive in 1902. Estates varying from 500 square miles and 156 square miles down to small farms and homesteads of one square mile were given away free. Later, estates were sold for trifling sums. In 1907 an official agent of the country toured in India to secure colonists of agricultural families for his country. By 1927, some 2,000 European landholders, both residents and absentees have come to own 9000 square miles of land—for the most part on 999 years' leases. Indians possess less than 30 square miles. No African tribe had any secure title to any land up to 1926. In 1926, there were 2½ million Africans, 26,750 Indians, 10,552 Arabs, and 12, 529 Europeans. A legislative Council was instituted in 1907 and the European population was granted the right in 1919 of electing non-official Europeans to the Council and the present cry is, according to Mr. W. Mc. Gregor Ross, late Director of Public Works Kenya, a change in the constitution of the colony so as to secure control over legislation, the purse and the details of the annual budget.

Baluchi conditions and Viceroy:—In his Durbar speech at Quetta on 21st April, Lord Irwin after referring to Lord Chelmsford's visit, the rising of the tribes, war with Afghanistan and the unrest along the border, observed that it was a matter for regret that a succession of years of unfavourable rainfall should have caused serious loss to certain parts of the province and especially to the Marri and Bugti tribes whose flocks had suffered severely from lack of grazing, but that with the help of the contract that was recently concluded with the Burmah Oil Company and the development of its mineral resources the prosperity of the Bugti tribe would be steadily restored. A branch of the Lloyd Barrage Canal was to be brought into Western Nasirabad; the uncertainty of the present system of irrigation by inundation canals would then cease and a perennial supply of water would be secured to those lands which were within reach of the proposed extension. He said that it had also been decided to allot a considerable part of Government waste land for cultivation to the Marri and Bagtis whose present conditions were difficult. He congratulated the Khan of Kilat on his efficiency in administration, the development of communications that had been effected in his State and on his Highness' recent decree abolishing slavery which had existed from very ancient times.

NOTES.

All India Ayurvedic Conference:—At the recent session of this conference which met at Patna under the presidency of Pandit Madan Mohan Malavya several lectures were delivered of which two were important. They were (1) on the identity of minerals by Pandit Pratap Singh and (2) on vegetable drugs by Mr. K. R. Datta. Of the 10 resolutions passed, one requested provincial ministers, chairmen of local boards and Municipalities to establish herb-gardens in their respective jurisdictions.

Baroda was the first amongst the Indian States to open an agricultural course several years ago. But a knowledge of improvements did not permeate among the people as in other parts of India. With an impetus given to the question during the past year Baroda wishes again to become active and to introduce agriculture in schools. With the advent of Mr. V. T. Krishnamachari as Diwan who has considerable knowledge of agriculture in his own

province of Madras His Highness the Gaekwar's government should find no difficulty to adopt any measure calculated to improve the lot of the meek peasant.

An Agricultural Endowment:—Mr. G. Venkatakrishnayya, a pleader in Bangalore has placed at the disposal of the Mysore Government 273 acres of good land and a sum of Rs. 7500 for opening and maintaining a free agricultural school and a free hostel.

The Assam Government have appointed a Committee to investigate the question of taxes on existing grazing areas and their effect on the milk supply in the province.

Punjab Land Revenue Legislation:—Last month a bill was introduced in the Punjab Council to effect some changes in the system of land revenue assessment. In practice, the Government's demand, says the *Servant of India* of March 31, never exceeded one half of the nett assets of the area under cultivation. These are now defined in the bill as the estimated average annual surplus produce remaining after deduction of cultivation expenses. The present bill seeks to lower this limit to one-third. In Bombay, the Committee has suggested that the assessment should not exceed 25 per cent of the profits of cultivation. Under the Punjab bill, the maximum enhancement has been fixed at one-third, in Bombay, the existing limits are 33 per cent for a group of villages, 66 for a single village, 100 for an individual holding. This, the Committee suggests, should be replaced by an all round 25 per cent. The Punjab bill recommends 40 years as a normal period for revision of assessment and provision is made in the bill for getting the legislative council's sanction to the Land Revenue Assessment rules.

Loss of Manures from Madras:—Mr. R. D. Anstead writes in the *Planters' Chronicle* an interesting note on the extent of annual drain to Madras of its actual and potential forms of organic fertilizers. He says that in 1926 India exported of bones 45,706 tons, of groundnut cake 107,642 tons and of groundnuts 444,000 tons; and during the same period Madras exported 7,895 tons of bones, 323,120 cwt. groundnut cake, 355,293 gingly cake, 20,653 cwt. castor cake, 8,413,199 cwt. groundnut seeds, 564,404 cwt. castor seeds and 13,995 cwts of horns. The export of rice from All India was 2'31 million tons and the exports from Madras

were 1,999,794 cwts. of rice valued at 20,579,366 Rs. 44471 cwt. paddy valued at Rs. 244,893 and imports were 747,970 cwts of rice valued at Rs. 5,458,587.

American Appreciation :—In the course of a note on Mr. T. V. Ramakrishna Ayyar's visit to the United States, the *Entomological News*, says :—Mr. Ayyar was the first Indian to take up the study of Entomology in his country. He joined the entomological department of the Government of India in 1903 and has been doing entomological work ever since.

In addition to a thorough knowledge of Tropical Entomology in general, Mr. Ayyar, has specialised in Hymenoptera, Coccidae and Thysanoptera and earned a worldwide reputation.

Though Mr. Ayyar is new to America his publications are quite familiar in entomological circles. He comes here with a view to see at first hand the work done by American entomologists and get into personal touch with them. He will spend a few months in visiting the important Natural History Museums of the country and return to India via England, France, Germany and Italy.

A Madrasite at Rothamsted :—Rural India (Madras) understands that Mr. V. Subramanyam B.A., of Trichinopoly who with one of Sir J. N. Tata's scholarships for studies abroad went to England in 1924 and has been working at Rothamsted has secured the prize offered by the Research Committee of the Royal Agricultural Society. The subject of his original investigation was 'The Chemistry of Waterlogged Soils.'

Chintaldevi Cattle Farm :—The Hon'ble Mr. A. Ranganatha Mudaliar, the Minister, paid a visit to this farm in the middle of the month and according to the Kavali correspondent of the 'Justice,' the fate of this useful institution seems to be hanging in the balance and proposals seem to be afoot to hand it over to private bodies for being run as a Dairy Farm.

Mr. H. C. Sampson, formerly of the local Agricultural Department has been appointed Economic Botanist at Kew in connection with the work of the Empire Marketing Board.

Chemists meet :—Members of the local chemical sections who at present number 25 met informally on the 24th of last month to devise ways and means for securing better recognition and attaining improvement in their own line. As a preliminary step they decided to hold periodical meetings for exchange of opinions, and discussions and consultations. In time we hope this will lead to the formation of a chemical society for Madras with headquarters at Coimbatore.

Will the breeders who form an equally large number of agricultural workers follow suit?

We venture to think that a leavening with private chemists will be found necessary to lighten the burden of officialdom which is bound to weigh heavier and heavier by insensible degrees if all members of an association belong to one particular department.

His three days' stay at Coimbatore in connexion with the All-India Nayudu Conference from 14th to the 17th instant enabled our ex-Minister, Sir, K. V. Reddi Nayadu Garu to pay a flying visit to the College and thus show his interest in the Agricultural Department.

Agricultural Summer School 1927 :—As one result of the very beneficent many sided activities of the Y. M. C. A. Rural reconstruction movement a Summer School imparting knowledge in the following subjects, will be held in Singaiallore (Coimbatore District) from 2nd May 1927 to 31st May 1927.

Elementary Agriculture, Co-operation, Poultry-Farming, Sericulture, Indigenous Dyeing, Carding and Spinning of Cotton, Calico-Printing, Bee-keeping, Rug-making, Mat-making, Rope-making, Carpet-making, Village Panchayats, Adult Literary Education.

For the benefit of illiterate villagers instruction will be in Tamil.

The School is open to all men and women irrespective of caste or creed. Admission fee is Rs. 3 per head. For the convenience of those who are unable to make their own arrangements, vegetarian food will be provided for Rs. 20 per head (payable in advance) for the 30 days. Lodging will be free.

DEPARTMENT NOTIFICATIONS.

Appointments, Promotions, Transfers, etc.—

Mr. M. Alaghiriswami Nayadu, Plant Collector, Aduthurai, to be Lower Subordinate, 4th grade on probation at Buffalo Breeding Station, Guntur. Mr. P. K. Krishnan Nambiyar, assistant manager, Hosur Cattle Farm, transferred to the College Dairy, Coimbatore, in place of Mr. M. V. Narasimha Sastri, transferred to the Hosur Cattle Farm. Mr. M. P. Kunhikutti, Farm Manager on expiry of leave to the College Dairy, and Mr. T. G. Anantarama Ayyar, Dairy Manager on the expiry of the leave to report himself for Dairy training at Bangalore on 1-6-1927. Mr. B. P. Pappayya appointed lower subordinate and posted to 1st circle.

The following Upper Subordinates are confirmed.

Second grade:—Mr. S. N. Chandrasekhara Ayyar; *Third grade*—Messrs. J. A. Muliyal, T. S. Ramasubramanaya Ayyar, P. N. Krishna Ayyar, and K. Venkatarama Ayyar; *Fourth grade*—Messrs. S. Kasinatha Ayyar, K. M. Thomas, D. Marudaraja Pillai, S. Jobitha Raj, S. Dharmalinga Mudaliyar and C. Krishnan Nayar.

The following promotions are ordered from 1st April.

From second to first grade:—Mr. K. Cherian Jacob, M. Mangesa Rao and V. Muthuswami Ayyar.

From third to second grade:—Mr. T. V. Subramanya Ayyar, T. Budhavideya Rao Nayadu, A. Chinnatambi Pillai, S. Sitarama Patrudu and M. Arogyasami Pillai.

From fourth to third grade:—Messrs. S. Narayana Ayyah, V. G. Dhanakoti Raju, C. S. Madayya, K. T. Bhandari, M. U. Vellodi, M. Viraraghava Rao, and R. Swami Rao.

From fifth to fourth grade:—Messrs. R. Chokalingam Pillai, C. S. Gopalaswami Rao, K. Govindan Nayar, T. S. Ramakrishna Ayyar, K. W. Chakrapani Marar, V. Ratnaji Rao, K. Ramanujacharya, A. Gopalakrishnayya, A. Gopalan Nayar and K. M. Jacob.

The following to be provisionally permanent appointments from 1st April: From fourth to third grade—Mr. C. V. Ramaswami Ayyar from date of reversion from foreign service. From fifth to fourth grade Mr. P. Vishnu Somayajulu.

Transfers:—Mr. M. K. Swaminatha Ayyar to be Agricultural Demonstrator, Wallaja, Mr. S. Subramanya Ayyar to St. Thomas Mount and Mr. A. J. Mascarenhas to Palur Experiment Station Mr. K. M. Venkatachalam Pillai, Assistant Demonstrator to be Sub-assistant to the Cotton Specialist.

Mr. R. Subramany Asari to officiate as Assistant Manager, Hosur.

Leave etc:—

Second circle:—Mr. K. V. Seshagiri Rao, Assistant demonstrator Tenali, leave on average pay for one month.

Mr. V. G. Dhanakoti Raju, Farm Manager Guntur, leave on average pay for one month and fifteen days from 25th April.

Mr. S. Sitapathi Rao, Assistant demonstrator Nellore, leave on average pay for one month.

Mr. K. Gurunarti Agricultural Demonstrator leave on average pay for two months from 25th April.

Third circle:—Mr. S. Varadarajulu Nayadu Assistant Manager, extension of leave for 2 months on medical certificate.

Mr. S. M. Kalyanaramayyar, cotton assistant, leave on average pay for one month.

Fourth circle:—Mr. A. Ramaswami Ayyar Farm Manager, Palur, leave on average pay for 3 months.

Fifth circle Mr. U. S. Ayyaswami Ayyar Assistant demonstrator, Mayavaram leave on average pay for one month from 5th May.

Mr. J. C. S. Anthony, Assistant demonstrator leave on average pay for one month.

Sixth circle:—Mr. A. Ramalinga Ayyah extension of leave on half average pay up to 12th April.

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From fifth to fourth grade :—Messrs. R. Chokalingam Pillai, C. S. Gopalswami Rao, K. Govindan Nayar, T. S. Ramakrishna Ayyar, K. W. Chakrapani Marar, V. Ratnaji Rao, K. Ramanujacharya, A. Gopalakrishnayya, A. Gopalan Nayar and K. M. Jacob.

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Mr. R. Subramany Asari to officiate as Assistant Manager, Hosur.

Leave etc :—

Second circle :—Mr. K. V. Seshagiri Rao, Assistant demonstrator Tenali, leave on average pay for one month.

Mr. V. G. Dhanakoti Raju, Farm Manager Guntur, leave on average pay for one month and fifteen days from 25th April.

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Fifth circle Mr. U. S. Ayyaswami Ayyar Assistant demonstrator, Mayavaram leave on average pay for one month from 5th May.

Mr. J. C. S. Anthony, Assistant demonstrator leave on average pay for one month.

Sixth circle :—Mr. A. Ramalinga Ayyah extension of leave on half average pay up to 12th April.

Seventh circle :—Mr. S. Krishna Nayak, Demonstrator leave on average pay for 10 days.

Live Stock :—Mr. M. P. Kunhikutty, Manager, leave on average pay for three weeks from 5th and Mr. T. G. Anantarama Ayyar, Manager leave on average pay for two weeks from 10th May.

Mr. F. L. J. Lobo, assistant Manager, leave without allowances for 6 weeks from date of relief.

Mr. K. Ramanujacharaya Manager leave on average pay for 15 days.

P. S. Section :—Mr. N. Parthasarathy, Assistant, leave on average pay for one month and eleven days in continuation of Easter.

Mr. S. Venkataraman, Assistant Manager Aduthurai, leave on average pay for one month and eleven days in continuation of Easter.

G. M's Section :—Mr V. D. Kenchayya Sub-assistant, leave on average pay for one month from 27th April.

Central Farm :—Mr. N. Narayanan Assistant farm manager leave on average pay for one month.

EDITORIAL.

An unmerited obloquy :—Our attention has been drawn to certain unfavourable remarks in the March number of the 'Young Men of India' concerning the work of the agricultural demonstrators. These we entirely repudiate knowing as we do in close quarters the excellent work this class of officers do amidst difficulties of a kind which none else can realise. We are sure that the criticisms that the agricultural demonstrator is indolent, he lacks vision, even a sense of responsibility, his visits are few and far between and that he fails to pierce through the sentimental conservatism and ever growing ignorance of the cultivator were made by ignorant men in a lighthearted way. They were swallowed by young undergraduate students of immature judgement who went out on hurried trips to make enquiries on knotty and serious problems of village

economics which have baffled experts and the notes have been transcribed perhaps quite unwittingly by the writer who seems to have been unmindful of the harm such ill-informed criticism may do to the cause of agricultural improvement. We would only refer him and adverse critics of his way of thinking to the proceedings of the Tanjore District Mirasdars' conference at Aduthurai in January last, to the considered opinion of the real ryots that had assembled there and the resolutions they insisted on passing on behalf of demonstrators.

Indian Ryots' World Tour :—Since the occupation by the British, several commissions and committees have visited India. During the last decade or two, tourists from Latin America, the United States, Canada, Sweden, France, Germany, Italy, Egypt, Africa, Australia and Japan have flooded the country. Indian science, archaeological interest, social problems, Indian literature commerce and industry, Indian philosophy and religions have each drawn several every year and the Royal Agricultural Commission has just left the country. We have heard of the South African Farmers' visit to Europe. Such visits serve to bring together the less advanced and the more advanced together and in a majority of cases to the benefit of both. It will be still more advantageous if a small batch of intelligent farmers from Madras were sent at State expense to spend their next summer in important countries in the West and return with added and more useful knowledge than often becomes the stock-in-trade of an average visitor to the Occident. In Italy and Spain the best paddy cultivation can be seen. In France especially in her southern departments, the intensive farming of small holders will arouse one's curiosity. In England, cattle breeding will arrest your attention, and in U. S. A., large scale-farming with the bewildering accompaniments of varied costly agricultural machinery, vast expanses of corn, cotton and wheat. In Australia one can bathe one's eyes with magnificent wool bearing sheep and in Hawaii and Java the fabulous yields of canes will fill one with awe.

Further a tour of the kind proposed will widen the horizon of the ryots and they will see and judge what modern methods are doing for agriculture in other climates and take to them much more kindly and quickly than heretofore.

Is such a world tour a day dream under present circumstances? We trow not because this is meant for production purposes.

British National Diploma Examinations :—The N. D. A. and N. D. D. examinations were instituted in 1893 largely through the efforts of the late Mr. James Macdonald. Since their inception, however, adverse critics have become numerous and among them the most formidable are Sir Daniel Hall, Sir Robert Grieg and Professor Robert Wallace. The battle has raged between the two sections with changing vigor all these 30 years and a flank attack which is expected finally to decide the issue has recently been made and the question will, we understand, be settled this month at a meeting of the Highland and Agricultural Society of Scotland Board. It is unfortunate that University professors should take up their cudgels against these examinations. The diploma, we are credibly informed, has served a very useful purpose being intended mainly to afford opportunities for study and attaining distinction to candidates—and there are hundreds and thousands—whose circumstances bar attendance at University or College qualifying classes. The scheme is complete in itself, well conceived and eminently practical and the examinations occupy a position in agriculture quite analogous to the London University examinations in the departments of literature, commerce and industry. The advocates of the N. D. A. examinations say that the B. Sc. degree in agriculture of several universities in Britain has now become a much coveted distinction and the tendency has been towards the magnifying of the University degree and the belittling of the extramural diploma. Though we do not endorse these views in toto we are sure that each is essential and has a distinct purpose to serve, as the diploma ensures more intimate acquaintance with the art of husbandry while the degree secures quicker grasp and wider outlook for the holder.

Indian Representatives Abroad :—It is extremely gratifying that the Indian and South African governments should have come to an honorable agreement and found the necessity for a representative of the Indian government to be stationed at Pretoria to look after the interests of Indian settlers. Madras is to be congratulated on the selection of the Right Hon'ble V. Srinivasa Sastri, P. C. for this high office of Government of India Agent in South Africa. His appointment has evoked universal approbation. This raises the question of the need that exists in the interests of

the ryots for similar posts in several other countries, with which India carries on an immense volume of trade. She exports jute, wheat, cotton, rice, groundnut, castor, copra, linseed. So far as we know, no Indians are found in any country where Indian produce finds a ready market in positions analogous to those of the Consuls of different nations stationed in important centres in this country. Trade depression in 1915 compelled the late Lord Pentland to take the initiative and suggest the Chadwick-Black deputation that did some good work in France and Russia on behalf of Indian trade, but nothing has since been done in this direction. With the fall in world prices and the trade depression that is likely to overtake the Indian ryot, his position will soon need to be looked into, when perhaps it will be too late. It would therefore be well that this question of representatives which affects Indian foreign trade movement engages the early attention of government. We understand that they have in contemplation the introduction of a bill to better maintain the major ports and to regulate trade therein for which both the ryot and the trader will be thankful.

Minister's Visit :—The Hon'ble Mr. A. Ranganatha Mudaliyar, Minister for Agriculture and Industries was on a visit to the College on 4-6th instants. During his stay he inspected all sections. Students in residence presented him with an address on the 5th afternoon in the course of which they requested that the Local Government might sanction a scheme for encouraging private farming by agricultural students on the model of the proposed Punjab scheme and that post-graduate courses be instituted for specialised and advanced work in agriculture and allied sciences in the College, now that the Madras University had declared graduates of this college eligible for University studentships and fellowships for post-graduate studies. This opportunity was also availed of for the unveiling by Mr. R. D. Anstead, of the portrait of Mr. F. R. Parnell presented by the Paddy section and referred to in a former issue of this journal. The Director also welcomed the Minister in appropriate terms (speech published elsewhere in this issue) referred briefly to the work of the department and presented the winners of the several prizes to the Minister who kindly gave them away.

The Hon'ble Mr. Mudaliyar in his joint reply, spoke of the large scope there was for honest work in this department and

concluded with an expression of hope that the toiling peasant outside would not be forgotten by any agricultural worker, in his zeal for effecting improvements.

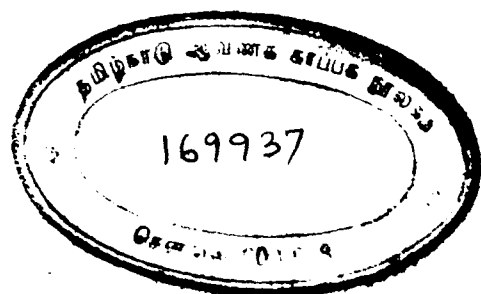
In spite of his illness and the sad bereavement he had by the loss of his mother, Mr. Rao Sahib M. R. Ramasami Sivan, the Principal both by his presence and the interest he took in encouraging the students, contributed very largely to the success of the functions.

Obituary:—On the 21st March, passed away at Cuddalore N. T. our young friend Mr. O. K. Balasubramanya Pillai, a certificate-holder of 1922. He had been bedridden with an attack of white diarrhoea for a twelve month. In him the agricultural college has lost a practical farmer and the Karkhathar Vellala community, a generous and trust worthy member. His one ambition was to cultivate his lands on modern lines and towards this end he had his portion of the ancestral property partitioned off, against the wishes of his conservative father. Alas! Cruel Fate decreed otherwise. The late Mr. Pillai's well-wishers and friends offer their condolences to his devoted wife and loving relations.

Added:—

Mr. C. Gopala Nayar is the winner of the certificate course cup referred to in Mr. R. D. Anstead's speech.

Secretary, Lower Subordinates' Association notifies an annual meeting on the occasion of the College Day in July and appeals for co-operation, suggestions and help.



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EXCELLENT COMPLETE MANURES

For Paddy, Ragi, Cholam, Sugarcane, Coconut,
Tobacco, Fruit Trees, etc. etc.

WE HOLD LARGE STOCKS OF

Imported Chemical Manures, Bonemeal, Poonacmeal,
Bloodmeal, Milled Fish etc., etc.

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FOR the Excellent New NITROGENOUS FERTILIZER**

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"NITRATE OF LIME"—13 per cent Nitrogen, 25-30 per cent Lime, in a readily available form, well suited for South Indian soils which are generally deficient in Lime. This new Fertilizer has invariably given excellent results on COFFEE, TEA, RUBBER and CEREALS, and has obtained unsolicited testimonials.

**Refined Saltpetre, Dried Blood, Basic Bonesuperphosphate,
Flour Phosphate etc., etc.**

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The various Fertilisers are ground as fine as possible and mixed to order, or sold separately as required on the most favourable terms. Special quotations for large orders.

Our manure pamphlet giving useful information, and price will be posted on application.

Messrs. T. STANES & Co., Ltd.,

Coimbatore Manurial Works,
and Standard Saltpetre Refinery,
COIMBATORE.

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SULPHATE OF AMMONIA.

INDO-AGRI, LTD.,

AGENTS: SHAW WALLACE & Co., MADRAS.

Numerous Depôts for the retail sale of Sulphate of Ammonia to Agriculturists have now been opened in South India from which this essential Nitrogenous fertiliser can be obtained at any time and in any quantity at the fixed uniform **cash price of Rs. 8-8-0 per bag of 80 lbs.** gross (one Federation Maund).

If 4 bags ordered at a time it will be supplied F.O.R. buyer's nearest Railway Station at the same price.

"Star" Brand Sulphate of Ammonia is a Product of the British Sulphate of Ammonia Federation, Ltd., and is Guaranteed to be of Neutral quality and to contain not less than 20.5 per cent Nitrogen = 25 per cent Ammonia.

Arrangements have now been made to stock **Super-phosphate** also for the convenience of those who wish to apply these two fertilisers together.

A list of our Depôts with names of Inspectors in charge, Propagandists & Sub-Agents and addresses is given, below.

T. V. V. IYER. Propaganda Inspector.		24, Third Cross Road, Basvanguudi Post, Bangalorr.
NAMES OF DEPÔTS	ADDRESS.	PROPAGANDIST.
<i>Asst Propaganda Inspector, Trichy.</i>	"Gowri Vilas" Puthur, Trichy.	A. N. Vijayaraghavan B. A.
1. Trichinopoly.	53, Singara Tope St.	J. M. Masilomany
2. Tanjore.	Caddel's Road, opposite Ex. Engineer's Office.	S. Varadachari, L. Ag.
3. Tinnevely.	Kaliappa Nadar's Building, Main Road.	M. Kanthimathinatha Pillai, L. Ag.
4. Madura.	32, West Masi Street.	S. Subba Rao.
5. Coimbatore.	C/o B.O.C. Sub-Agent, Railway Compound.	S. Ramaswamy.
6. Pollachi.	52, Kumarapalayam Road.	N. R. Rajagopala Iyer.
7. Erode.	288, Lord Napier's St.	P.P. Subramony Iyer

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<i>Asst. Propaganda Inspector. Conjeevaram.</i>	70, Ekambareswarar Sannadhi Street Conjeevaram.	K. R. Ramaswamy B. A.
1. Gudiyatham.	C/o B.O.C. Sub-Agent, Public Road St., Darnampet.	C. R. Subramony Iyer.
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3. Trivellore.	167, Bazaar Street.	P.R. Venketeswara Iyer.
4. Villupuram.	306, Pondicherry Road, Junction:	N. V. Viswanatha Iyer L. A.
5. Madurantakam.	19, Annapillai Ranga-chari, Street.	C. Doraiswamy Mudaliar.
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2. Bezwada.	C/o B.O.C. Sub-Agent.	Ch. V. Ratnam.
3. Tenali.	Do. do.	Ch. V. P. Subramaniam.
4. Cuddapah:	126, Badharkhan Masjid Street.	M. Sarvagna Rao.
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