

PROGRESS IN DEVELOPMENT
DEPARTMENTS IN MADRAS
PRESIDENCY
1936



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IN MADRAS PRESIDENCY**

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Agricultural Progress in the Madras Presidency.

The Government have always recognized that the ryot has been and will always be the foundation of the economic structure in India. His welfare is a matter of national importance. His prosperity spells prosperity for the state. "Agriculture," it has been well said, "is a matter of national concern calling for deliberate and far-sighted national policies, not only to conserve the natural and human resources involved in it, but to provide national security, promote a well-rounded prosperity and secure social and political stability." This work has been earnestly undertaken by the Government of Madras. It may be considered under five heads.

I. Educational Facilities.

This year marks the celebration of the Diamond Jubilee of agricultural education in this Presidency. Sixty years ago, instructions in matters agricultural were given for the first time in an old abandoned granary at Saidapet near Madras. This we may take as symbolical of the condition of the agriculturists then.

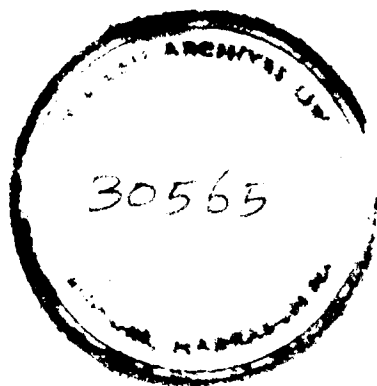
Things have changed and changed for the better. To-day, Government runs an Agricultural College at Coimbatore. The College is housed in an imposing building. To it is attached a large farm of about 400 acres. Here students go through a three year course both in practical and theoretical agriculture. They are taught different methods of cultivating wet, dry and garden lands. A dairy fitted with modern appliances, is attached to the farm. Blacksmiths and Carpenters shop and a good collection of agricultural machinery complete the equipment of the College.

Short Courses.

Government, recognizing that there is a demand for general agricultural knowledge, have instituted a series of short courses lasting over a period of nine months. Young men owning lands not in a position to undertake the three year course, resort to these short courses. Short courses are given in practical agriculture, including farm management, dairying, care of animals, jaggery, malt making, manures, crop improvement, insect-pests and diseases, vegetable gardening including horticulture and bee-keeping.

Scholarships to Muslim and Depressed Class Students.

Five scholarships of the value of Rs. 20 per mensem are awarded annually, two to students of the Muslim community and three to students from the Depressed and Backward Classes. Special



scholarships are granted to students from the agency tracts of Vizagapatam and Godavari.

Being fully aware that mental and physical developments of an individual go hand in hand the Government have sanctioned recently a non-recurring grant of Rs. 3,000 to provide extra game equipment at the College.

A statement showing the number of students admitted into the College and those that passed in the B.Sc. examination in each of the years 1930-31 to 1934-35 is given below :—

Year.	Number of students selected (excluding seats reserved for the Agency and for failed students).	Number qualified for the degree of B.Sc. (Agri.).
1930-31	42	24
1931-32	45	31
1932-33	48	54
1933-34	48	48
1934-35	44	39

The College at Coimbatore does not fully meet the needs of the agricultural population. Government help the running of certain other agricultural schools. There is, for example, an agricultural school at Usilampatti opened in 1929-30. It is primarily intended for the benefit of the Kallars. That it has served and is serving an useful purpose no one can deny. The school is run by the District Board, Madura, while the agricultural staff is lent by the Department.

Farm labourers have not been forgotten. At different agricultural farms a certain number of cultivators, maistries and field coolies are taken in, and given practical training in the use of simple agricultural machinery. Such training is given at Anakapalle, Coimbatore, Samalkota, Palur, Kasaragod, Nileshwar, Hosur, Hagari, Nandyal, Guntur and Taliparamba.

Education for farm labourers' children.

In addition to providing these facilities, farm labourers' schools are run at Anakapalle, Palur and Coimbatore. Here are educated the children of the labourers living near the agricultural stations. Improved methods of farming are taught to these boys.

To increase the scope for the employment of the graduate in agriculture, a course of instruction in Co-operation, Auditing and Banking was instituted in 1933-34. The course covers the entire period of the B.Sc. (Agriculture) course and is intended to enable the students to pass the Government Technical Examinations in these subjects, and thus become eligible for appointment as Junior Inspectors of Co-operative Societies.

Facilities are now afforded in the College at Coimbatore to study and obtain the M.Sc. degree of the Madras University.

II. Research.

At the present stage of our knowledge of agricultural science in India, the most important line of work is research, on which is based all agricultural improvement. An Agricultural problem is first taken up by research workers; gradually it involves the whole department, spreading to the farms for trial experiments and then to a trial on a field-scale, till at last, in the form of a definite recommendation, it is carried to the ryots in some quiet village by a band of demonstrators.

The chief centre of research is the Institute at Coimbatore equipped with a staff of specialists. Here, plant breeders are at pains to evolve new strains in paddy, cotton or millets; pathological problems affecting crops are investigated by the Entomologist and the Mycologist; the Chemist is engaged in matters dealing with the nutrition of plants and animals or with conservation of moisture; and the Research Engineer is concerned with the improvement of the various indigenous implements, bearing in mind the needs and limitations of the ryot.

In intimate associations with these officers are those in the districts—the Deputy Directors of Agriculture—who in their agricultural research stations have two-fold functions to perform, viz., the putting to test on a field scale the discoveries made at Coimbatore in places which are dissimilar in soil and climate and in the investigation of the various local problems in farming practices which await solution. Therefore the two sets of officers—those at Coimbatore and in the districts—work in collaboration with the one object of gaining exact knowledge which would ultimately result in benefiting the cultivator. Research, however, needs time and here patience is a virtue in the investigator as well as in the one who looks to him for help. The increase in recent years in the number of District Farms is an index of the progress of research in this Presidency. At the end of 1910 there were only 7 such farms; at the end of 1920, there were 20 and at the end of 1931 there were 26 permanent farms.

Agricultural Research Institute.

The department receives handsome financial aid for intensive research work on certain crops from the Imperial Council of Agricultural Research and the Indian Central Cotton Committee.

At the Research Institute, are to be found the Paddy Specialist, the Cotton Specialist, the Millet Specialist and the Oil Seeds Specialist. Besides these, there are the Mycologist, who deals with diseases of plants caused by fungi, the Entomologist who deals with insect-pests, the Bacteriologist the Agricultural Chemist and the Soil Physicist who carry out biological and chemical analysis of soils. A brief account of their work follows :—

- (a) *Botany*.—The section of systematic botany besides being engaged in systematic work, namely, compilation of a reference or a working herbarium to facilitate quick naming

of plants devotes a large part of its time to problems of economic nature, as one would expect the latter to take an increasingly important part as time goes on. Under economic work may be mentioned the survey of grazing areas at the Livestock Research Station, Hosur and Agricultural Research Stations at Palur, Palakuppam, Nanjanad, etc. As many as 170 grasses were collected and added to the list of grasses suitable for feeding. This section also carried out a survey of weeds in some circles and of fodder in a few districts.

Further, the Systematic Botanist has been devoting a good deal of his time to a survey and study of conditions in the chief plantain centres on the West Coast and in the Northern Circars and in 1934-35, 1,600 suckers representing the main varieties of plantain were distributed to several places including the Director, Botanical Gardens, Kew.

(b) *Chemistry*.—This section dealing, as it does, with comprehensive and important subjects such as analytical and advisory work, on animal nutrition, plant nutrition, and soil science, is equipped with the necessary staff and laboratories.

(i) *Analysis*.—Several departments of Government and the public utilize the services of the Analytical section in having samples of soils, manures, feeding stuffs, fodders, etc., analysed and in obtaining advice on matters dealing with such kindred subjects.

(ii) *Animal nutrition*.—The influence of manuring on the quality of seed and on the nutritive value of the crop has received considerable attention. It has been found that organic manures like cattle-manure and oil-cakes have a more potent influence on the nutritive value of a crop than other manures like mineral fertilizers; this information is of the utmost practical importance to us as a large body of our ryots depend mainly for their manure supply on cattle manure alone which is so essential to the food crops on which our millions depend. It has been found that in dealing with the feeding of animals, the Ongole work animal is more economic than the American animal. Similar work done with the Kangayam, another important breed of South India, revealed that taking animals of equal weight and put on a similar kinds of work the Kangayam is a more economic feeder than the Ongole, a fact in conformity with everyday experience placed as they are in much more uncongenial condition of soil and pasturage than those in Ongole.

(iii) *Plant nutrition*.—A study of the results of the manurial experiments that have been in progress during the last quarter of a century shows that the most useful manures for paddy are green manures in combination with or without phosphate, oil-cakes for sugarcane and for all dry

and garden land crops, farm-yard manure and that artificial manures are not indispensable, and that they serve best only in combination with organic manures. While among phosphatic manures, bonemeal and superphosphate proved profitable, crops showed little response to potassic manures.

(iv) *Soil sanitation*.—A systematic study of soil for their characteristics has been carried out. The object of such a study is to obtain precise information from the behaviour of soils towards varying cultural and manurial practices and to enable the chemist to advise the agriculturist on problems of soil fertility. From the available data on the analysis of clays it would appear that black soils are characterized by a high content of total silica (50.54 per cent) and lime and magnesia (5.7 per cent), and low iron and alumina (28 per cent). The red soils are relatively poor in silica (45 per cent), very poor in lime and magnesia (0.6 per cent) and richer in iron and alumina (41 per cent).

(v) *Soil surveys* were made of the Tanjore and Kistna deltas, Guntur, Godavari and Malabar districts and the Periyar tract. Similar surveys were undertaken of the Lower Bhavani, Tungabhadra, Cauvery and the Toludur projects.

Two special schemes of investigation, viz., one into the Chemistry of Malting Choram and another into the nutrition properties of animal foods aided by the Imperial Council of Agricultural Research were started in 1935 and are in progress.

Improved Crops.

Millets.—Occupying as they do over 14 million acres of cultivable land in the Presidency, the importance of millets cannot be over-estimated. These are grown in tracts where rainfall is treacherous, soil unkind and where the ryot is not sure of his next meal. Besides the Millet Specialist at Coimbatore, trained assistants in Millets are working at these crops in Hagari, Nandyal, Guntur and Koilpatti. These are concerned chiefly with work on choram (sorghum)—the most important cereal grain of the Ceded Districts. Improved strains have been evolved which not only give an increased yield but also resist disease better.

Two strains in summer sorghum (A.S. 809 in yellow and A.S. 1575 in white) having been found to be the most superior have been handed over to the District officers in Coimbatore and Salem for trial on ryots' lands.

Ragi.—Considerable knowledge has been gained in the selection and study of over 1000 units in ragi. It is believed that ragi can be grown practically all through the year. Ragi strain F.C. 593 may be grown in paddy lands when water is not sufficient for a

paddy crop. It is also ten days shorter in duration than the local ragi while giving a 20 per cent more yield. This strain has passed the stage of trial in the research farm and is being tested in the districts. It continues to be the best strain and has in some farms yielded 18 to 60 per cent increased yield. Moreover, this strain was found to do well in summer as well as in the main season and adaptable to the rain-fed conditions.

Other crops such as korra and cumbu are also receiving attention.

Mention must also be made of the Dry Farming Scheme which was started at Hagari in April 1934 with the help of the I.C.A.R. The scheme is intended to carry research into the improvement of all crops grown in the dry tracts including a study of the effect of different cultural treatment on the moisture, conservation and on the physical properties of the soil.

Paddy.—(i) Paddy being the staple food of the majority of the population is by far the most important crop in the Presidency. It is for this reason that plant breeding work was concentrated on this crop from the very beginning. As work progressed and as men were available, sub-stations were opened at Aduthurai, Maruteru and Pattambi, each in charge of a gazetted assistant. At these stations, work, both economic and agronomic is being carried on according to a well laid plan. Not only good yielding strains have been evolved but also strains which resist plant diseases better.

(ii) Eleven strains from Coimbatore, 11 from Aduturai, 9 from Maruteru and 6 from Pattambi were released during the period of last 15 years and have been rapidly spreading in the country. The increase in yield recorded by the stations have been found to be between 8 to 25 per cent. It may be mentioned that though yield is the main criterion other economic characters as good quality of rice, uniformity of grain size, etc., are also aimed at in the selection of strains.

(iii) In regard to the second crop problem in the Godavari delta, it has been found that it is possible to advance the harvest of crop by a month by adjusting the method of raising seedlings. Raising seedlings in the dry land seems to enable them to withstand adverse weather conditions.

(iv) Double transplantation of seedlings was found to be more economical and resulted in increased yield at the Samalkota Station and at Aduturai it was found that closer spacing and manuring induce greater development of awning in rice.

(v) A scheme of manurial trials for the first crop of paddy was completed at Maruteru in 1934-35. The general indications from the experiments were that the application of green manure definitely increased the yield and that organic manures such as oil-cakes serve the same purpose. Fertilizers like ammonium sulphate, ammophos and niciphos are as good as green leaves in increasing yields and act also in conjunction with them, but phosphatic manures do not show any increase when applied with green

leaves. A high increase of over 20 per cent was obtained where the second crop was manured with green leaves.

(vi) The area under improved strains of paddy which was estimated to be 29,000 acres in the Presidency in 1921-22 has extended in 1935-36 to 12,77,583 acres, while the total area including that under other improvements recommended by the department, e.g., Economic Transplantation, application of green manure, application of concentrated manures, etc., has increased from 6,83,350 in 1921-22 to 26,60,986 acres in 1935-36. The estimated gain to the ryots on these improvements during 1935-36 is Rs. 1,24,82,700 against Rs. 26,31,250 in 1921-22.

Cotton.—(i) The main work of the cotton section both in the central station at Coimbatore and in the sub-stations at Guntur, Nandyal, Hagari and Koilpatti is to produce better strains of cotton suited to different localities both by means of selection and hybridization, the work therefore being both economic and academic. Both irrigated and rain-fed cottons are dealt with.

(ii) Cambodia cotton is usually recommended to be grown under irrigation but owing to the common practice among ryots to grow it as a dry crop, it has been found necessary to evolve a strain suited to such conditions.

(iii) Certain hybridization work on cotton is being done with the help of the Indian Central Cotton Committee. A scheme called the Madras Herbaceum Scheme, another called the Pempheres and Physiological scheme and a third called the Fodder Cholan Scheme are being conducted by the Department with their help. The first is an hybridization scheme, the second is concerned with investigation of the causes for the variations among certain strains in the degree of attack of stem weevil, of breeding strains immune to its attack, and of the factors responsible for the shedding of buds and bolls of cotton. A new scheme called the Madras Nadam Scheme was also started in 1933-34 in Coimbatore with the object of evolving annual types suited to the soils where perennial Nadam cotton is grown now. Possibilities are indicated by research of evolving good annual types.

(iv) Agronomic studies on this crop consist in finding suitable rotation crops for cotton, groundnut and ragi. It is found that the type of soil has a greater influence on the choice of rotational crops than the extent of water-supply. On a sandy soil it is advantageous to grow groundnut before cotton but on alkaline land cholam or ragi does equally well.

(v) The area under improved strains of cotton which was estimated to be 52,900 acres in the Presidency in 1921-22 has extended in 1935-36 to 6,17,964 acres and that under improved methods of cultivation from 6,424 to 23,672 acres and the estimated gain per annum on these two items of improvements is estimated to be Rs. 46,60,041 per annum in 1935-36.

Fruit culture.—Increased attention has been given to fruit during the last few years. Fruit culture is in progress in almost

all the Agricultural Stations of the Province. There are however, four Research Stations where fruit is mainly grown, viz., Pomological stations at Coonoor, Burliar, Kallar and Kodur. At Coonoor, among a large number of varieties, plums occupy a prominent place. At Kodur special attention is being paid to the Citrus fruit and the mango. Research in the plantation of figs is being done at Samalkota and Aduturai. Special attention to plantain is being paid at Samalkota.

Oil-seeds.—This section is the most recent having been organized only in 1930. There is a Specialist in oil-seeds who is mainly concerned with the study of coconut, groundnut, castor and gingelly and particularly with the work at the coconut research stations at Kasaragod, Nileshwar and Pilicode. He is also in charge of the oil-seeds station at Erayanur near Tindivanam. Some preliminary work on oil-seeds is also carried out in the Central Farm at Coimbatore. Since the organization of this section 100 varieties of groundnut mostly imported have been acclimatized and tested for their yield of seed and oil. Among the spreading varieties in groundnut Saloum showed an increase of 20 per cent over the local variety and has also been found to be drought resistant. Among the bunch varieties the local Gudiyattam bunch yields better than any other. Investigation into the practice of damping nut before shelling showed that it was important that it should be dried well before they are stored in godown.

Work is also carried on potato, pepper, chilly, onions and tobacco. Work on potato is carried on the Nilgiris and consists chiefly in selecting suitable varieties for the Nilgiri conditions and testing methods of cultivation and manures.

The I.C.A.R. is financing research work on this crop on the Nilgiris at the Nanjanad station on specific lines and the scheme is to run for 5 years.

Work on tobacco is mainly carried on at the Guntur Station.

Sugarcane.—(i) A great stimulus to the cultivation of this crop was given throughout the Presidency by the levy of duty on sugar and the recent reduction in price of paddy. The Department lost no opportunity to extend work on this crop to almost all the stations where there are facilities for conducting trials in regard to it and the total area under improved varieties in Vizagapatam district increased to over 3,000 acres in 1932-33 against one thousand and odd in 1930-31, that in Kistna increasing to 2,500 acres. The area under improved strains of sugarcane was 40,262 acres in the Presidency at the end of 1934-35.

(ii) Research work is done chiefly at Anakapalle, Samalkota, Palur and Aduturai. It is also done now at Taliparamba, the chief items of research being varietal tests, irrigation and rotation experiments.

(iii) It is found that sugarcane planted in the months of February-April and harvested the following year would grow well and give juice of superior quality while the crop planted in June

responded poorly. At Anakapalle it was found that sugarcane planted in the ordinary furrow method gave slightly higher yield than that planted in trenches. The results of manurial experiments showed best yields when potash and phosphate were added to 200 lb. of nitrogen in the shape of cake and ammonium sulphate. Sugarcane-sorghum crops evolved by the Imperial Station are under trial at some of the district farms and if successful will revolutionize the system of sugarcane cultivation in this Presidency in reducing its period of growth and will be much more remunerative than paddy.

(iv) The total area under cultivation was 125,310 acres in 1934-35 against the normal area of 108,740 acres.

(v) The area under improved strains which was 7,559 acres in 1921-22 has increased to 39,597 in 1935-36. It is also estimated that the area under all the improved methods advocated by the Department in respect of this crop, including strains of seed, which stood at 7,718 acres in 1921-22 has reached 8,130 acres in 1935-36 and the estimated gain per annum has increased from Rs. 5,12,090 in 1921-22 to Rs. 24,01,638 in 1935-36.

Improvement of Livestock.

Since the arrival of His Excellency Lord Linlithgow as Viceroy in India, public attention has been focussed on the all important problem of livestock. The importance of livestock in the life of an agriculturist in India cannot be over stated. Not only does an agriculturist look to his animals for labour but also for valuable food. It is with a view to give him the maximum return under both heads that the Agricultural Department has been running research stations at Hosur and Guntur. At Guntur special attention is paid to buffaloes and to the Ongole cattle. At Hosur work on the improvement of important breeds, e.g., the Kangayam, Sindhi, cross-breeds, and Hallikar has been going on. The Bellary breed of sheep has also been receiving attention. Poultry too is an important item of work at this station.

The Government with a view to encourage ryots to own better cattle, give a premium of hundred rupees for every breeding bull which satisfies certain conditions. It is unfortunate that full advantage of this system has not been taken by the ryots. The figures given below speak for themselves:—

Breeding bulls maintained under the premium scheme:—

1930-31—82.	1933-34—83.
1931-32—72.	1934-35—100.
1932-33—72.	

The agricultural demonstrators in the course of their tours, give advice to the ryots on how to improve the condition of their cattle by proper housing, feeding and general management.

Intimately connected with this problem is the question of fodder and food supply. The value of concentrates has clearly proved by the experiments carried on by the department. Fodder is not

always easily available for cattle. How best to utilize the Reserved and Panchayat forests for this purpose has been the constant endeavour of the Forest department. The methods of storing of fodder have also been borne in mind.

III. Propaganda.

The successful results of research are made known to ryots by propaganda through the agency of demonstrators, exhibitions, motor vans, lantern lectures. Demonstration to the cultivator of results of research hand study are carried out on plots of cultivator's own lands as well as in demonstration areas in agricultural farms. Advantage is taken of cattle fairs, religious festivals, etc., to hold small agricultural exhibitions and to give lectures illustrated with magic lantern and distribute departmental literature. No methods which require more capital expenditure than the ordinary ryot is able to afford are advocated by the department :—

- (a) *Demonstration.*—To help Deputy Directors in their administrative and inspection work, Assistant Directors are attached to most of the circles and there are a number of demonstrators employed in each circle whose jurisdiction is generally confined to a taluk.

Items of Propaganda.

Some of the main improvements which have been effected by the Department in recent times and which are demonstrated and brought to the notice of the cultivators are the following :—

- (a) *Methods of cultivation.*—(1) The economic planting of paddy and the use of thinly sown seed beds.

(2) Planting of sugarcane in lines to reduce the number of setts (this method reduces the seed rate 25,000 to 15,000 or 18,000 setts per acre).

(3) The drill sowing of cotton and other crops to reduce seed rate and to facilitate inter-cultivation.

(4) Introduction of new rotations to improve the land or to increase the crops and profits.

(5) Introduction of improved methods of planting and inter-cultivation of coconuts (about 1,900 acres of coconut were inter-cultivated in V circle in 1930-31).

- (b) *Methods of manuring.*—(1) The replacement of leaves from the forest areas by growing green manure crops on the land itself and the use of green dressings as organic manures generally and also to prevent salinity.

(2) Improvement in the method of collection and preservation of "farm yard manure"—such manure is best preserved in pits and not in heaps. Further the ryots are advised to cover the floor of cattle-sheds with litter or loose earth to absorb the urine, as otherwise the urine runs to waste.

- (3) Making of composite manures from organic matter.
- (4) Using of night soil in the form of poudrette as manure.
- (5) Use of various manures such as fish, bonemeal and oil-cakes as also chemical manures for different crops. Groundnut cake, ammonium sulphate and super-phosphate for sugarcane and green manure of different sorts and super-phosphates or bonemeal for paddy were the manures recommended. In the V circle, where cattle manure is largely used for paddy, the recommendation was to reduce its quantity and in its place the substitution of ammonium sulphate to make cattle manure go a longer way.

- (c) *Distribution of improved seed.*—Improved varieties of sugarcane and strains of paddy, cotton, ragi, cholam, etc., were introduced either to increase the actual yield or to resist disease. The ryot is unable to maintain for himself a pure seed supply and is therefore in constant want of it. The distribution of different strains of seed has been the greatest achievement of the Department's demonstration activities.

An important feature in the distribution of improved seed by the department is that seed farms are utilized for the multiplication of definite strains of seed evolved by the Crop Specialists. An agreement is entered into by the Circle Officer with such individual ryot, the conditions of the agreement varying with the crops. Seed farms exist in the I (paddy and sugarcane), III (cotton), V (paddy), VI (cotton), and VIII (potato and cotton) circles. If the ryot should be thrifty, reliable and progressive, he may have opportunities of learning improved methods of cultivation also, in addition to multiplication of seed. The seed may be supplied free of cost or supplied on certain other conditions and advances for cultivation expenses are also made.

The following statements show the distribution of improved strains of seed under different crops :—

Cotton.						
Cotton variety.	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.
	lb.	lb.	lb.	lb.	lb.	lb.
(1) Cambodia ..	275,900	287,000	565,506	884,600	741,361	1,320,487
(2) Karunganni ..	800,000 *	172,860	234,967	219,800	232,575	189,895
(3) Westerns ..	258,800 *	248,000	169,071 *	201,897	297,993 *	69,520
(4) Northern ..	41,000	88,675	111,153	10,088	750	..

* Includes quantity advanced on loan under seed farm conditions.

Besides these, the Tiruppur Trading Society which maintains a seed-farm with help from I.C.C.C. for the propagation and distribution of improved (Co2) Cambodia cotton-seed distributed a good quantity of seed. The same purpose is also served by the Idaseval-seed Union in Tinnevely in respect of Karunganni.

Cholam.—A 20 per cent increase over the local variety was obtained (mostly T1) by showing the improved strains.

	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.
Cholam (lb.) ..	11,286	6,400	10,298	5,224	2,306	10,000
Coconut (l) seed nuts ..	5,575	4,020	600	11,250	11,006	10,884
(l) Seedlings ..	24,575	7,787	4,720	545	4,009	4,690
Paddy (tons) ..	180	200	280	1,677	1,567	2,479
Groundnut (lb.) ..	3,746	..	..	8,000	1,220	11,171
Potato (mds.) ..	2,118	5,000	1,668	2,092	65,674	1,402
						maunds and 27,527 lb.
Sugarcane (Setts.) ..	400,000	..	..	8,500	134,778	1,241,296

Improved Agricultural Machinery.

(d) Introduction of improved agricultural machinery.—(1) Introduction of iron mills for crushing canes and improved furnaces for boiling jaggery.

(2) Use of other improved agricultural machinery. Demonstration of improved implements are held with a view to introduce them to the ryots and in such cases they are stocked for sale at the depots. Important of the implements demonstrated are :—

H. M. Guntaka—an excellent harrow.

Junior hoc.

Roll easy mhote wheels.

Improved seed drill.

Persian wheel water lift.

Cooper's ploughs.

Cane crushers and centrifugal machines, and the sale of implements to ryots include also :—

Iron ploughs.

Bund formers.

Sugarcane mills.

Chaff cutters.

Buckscrapers.

Archimedian screws.

The number of demonstrations conducted with improved agricultural appliances were :—

2,000 in 1930-31.

5,000 in 1931-32.

6,800 in 1932-33.

9,600 in 1933-34.

12,000 in 1934-35.

In conformity with the popularity the sugarcane cultivation has gained recently, encouragement has also been given to the construction of improved furnaces for making jaggery and in 1934-35, 387 such furnaces were constructed and 1,045 demonstrations on the method of preparing good jaggery were arranged, besides demonstrations in the manufacture of white sugar, with the use of centrifugals.

(e) Introduction of improved methods of dealing with pests and diseases.

The pests against which control methods are demonstrated are paddy grass-hopper, aphid on tobacco, hairy caterpillar on groundnut, stem bleeding disease and nepharites and the slug caterpillar on coconut, spodoptera on paddy, Mahali disease on arecanut, bud-rot on palmyra, stem weevil on Cambodia and minor pests like smut on sorghum, thrips on chillies, paddy blast and case worm on paddy. The cochineal insect which successfully eradicates prickly-pear has been in great demand and with its use prickly-pear has been fast disappearing throughout the Presidency.

IV. Loans to Ryots.

It has been the policy of the Government to encourage ryots to improve their economic condition by taking full advantage of the fruits of research carried on by this department. As early as the second half of the last century, the Government took upon itself the duty of supplying the ryot with loans at low interest for purposes of land improvement, purchase of cattle, seed and fodder, and for removal of noxious weed such as nut-grass from their fields. The disbursing of such loans has been entrusted to that old and tried agency the Revenue department. In the last five years lakhs of rupees at the rate of over ten lakhs a year have been disbursed as loans.

To supplement this work and provide the ryots with further facilities, Government have authorized the Deputy Directors of Agriculture to grant small loans up to Rs. 25 in each case for the purchase of agricultural implements. The Director of Agriculture also grants loans about this limit. This system began in 1932-33. In that year a sum of Rs. 1,762-8-0 was so disbursed. In the next year over Rs. 12,000 were granted and in 1934-35 over Rs. 15,000 has been spent.

This money was spent by the ryots in the purchase of improved ploughs, Persian wheels, Mhote wheels and buckets, Sprayers, Seed-drills, etc.

Nor should it be forgotten that valuable financial help is given to the ryots through the agency of the Co-operative department. Land Mortgage Banks have been recently constituted. Further, Government has appointed Special Loans Officer to rescue the ryot from the burden of his old debts. Such Special Officers are working at present in several parts of the Presidency and Government has set aside a sum of Rs. 20 lakhs for this particular purpose.

The Government have thus spread a net work of agencies to provide credit to the ryot. In fact they have taken credit facilities to the very door of the ryot.

V. Marketing.

The Government interest in the well being of the ryot did not stop at this. For sometime it has been the view of Government that of all practical measures for improving economic conditions

an intensive programme to develop marketing facilities for agricultural products relating both to crops and livestock offer, in the existing circumstances, the greatest scope for substantial results. In Madras, a Provincial Marketing Board and a Provincial Marketing Officer have been appointed, to collaborate with the Agricultural Marketing Adviser to the Government of India. A special staff consisting of three Assistant Marketing Officers has been appointed with the aid of a grant from the I.C.A.R. Each of these officers has been placed in charge of a group of crops to carry out survey of existing and potential markets.

The work of the marketing staff may be divided into (1) investigation, (2) development, and (3) work on grade standard. In this Presidency marketing surveys of several crops such as paddy, tobacco, groundnut, plantain, linseed, wheat, eggs, etc., have been completed. Certain general questions are also included within the scope of the survey, such as regulated market, marketing organization, transportation, storage and preservation of the commodities, etc.

The programme of development work must obviously depend on the results of the marketing surveys. It may be possible to organize small packing stations, e.g., for eggs and fruits, with a view to demonstrate the practicability of bulk storing, grading, packing and the commercial advantages of employing the new standards.

The work on grade standards will be of a technical character relating to the chemical and physical characteristics of such products as oil-seeds, grains, fruit, etc., and the testing of grading, technique and equipment under practical conditions.

A number of co-operative societies and sale societies were either started or revived recently. The Lalgudi Sivagnanam Agricultural Society, the Tanjore Loan and Sale Society, the Loan and Sale Societies at Vallaru and Nilamangalam, the Tuticorin Crop Loan and Sale Society (to facilitate the marketing of cotton) the Anakapalle Loan and Sale Society (sale of jaggery, the Etikoppaka Co-operating Industrial and Credit Society) the Thummapala Society, both in the Vizagapatam, the Tiruppur Co-operative Trading Society, the Salem Weavers' Society, the Rasipuram Co-operative Trading Society and the South Arcot Central Co-operative Groundnut Sale Society are some of the outstanding institutions which have been helping co-operative marketing of agricultural produce.

Lastly mention must be made of the Madras Commercial Crops Markets Act which was passed in 1933. The Act has been brought into force from 1st January 1936 in the Tiruppur area in respect of cotton for the marketing of which regulated markets are to be established under the Act. The Market Committee has recently been formed and with the experience of the working of the Act, it will be extended to other cotton areas and possibly to other commercial crops as groundnut, tobacco, etc.

Progress of Work in the Fisheries Department in the Madras Presidency.

Fisheries as a source of wealth, occupation and food supply, are an important national asset. In the undeveloped state of the industry in India, pioneer work in catching and preserving methods and in extending the distribution of fish and fish products is needed. The steps taken by the Fisheries department for the betterment of the masses may be conveniently brought under the following heads:—

- (i) To increase the food supply of the masses by developing fisheries;
- (ii) to stimulate the main and allied industries by improving existing methods and introducing new methods, with the ultimate object of increasing catches, preserving fresh fish for the interior markets and converting the fish which cannot be consumed as food into oil, manure and other by-products;
- (iii) to educate the fisher children and to assist the study of natural history generally by maintaining the public aquarium, and by the supply of biological specimens;
- (iv) to improve the material and moral condition of the fisherfolk; and
- (v) to propagate and distribute larvicidal fish in malarial localities as an anti-malarial measure.

Increase of Food Supply.

The chief defect in the diet of the masses in India, according to experts, is the lack of the body-building element (protein), and fish provides it in the cheapest and the most readily available and assimilable form. The most important source of fish supply is the sea. Efforts, therefore, have been made to increase the catches, extending the range of fishing operations and improve the methods of preservation and distribution of sea fish. Fishery research is conducted at the three shore stations at West Hill (Calicut), Krusadai Island and Vizagapatam. At the Calicut Research Station which was established in 1921, biological investigations on sardines and mackerel, two of the most important economic fishes on the West Coast, are carried on. Since 1931-32 progress has been made in the analysis of plankton and its relation to the habits of oil sardine which constitutes an important element in the fish industry of the West Coast. The Krusadai Station was established in 1923 mainly

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with the object of investigating the causes of the irregular periodicity of the Indian Pearl Fisheries and the adoption of remedies to counteract the influence relating to such irregular occurrences. The most important work lately undertaken by the department which is in progress at this station is the rearing of pearl oysters. At Vizagapatam the Inspector of Fisheries is carrying on the collection and identification of the common food fishes of this coast.

Valuable knowledge of the deep-sea resources and fishing grounds of the Presidency has been acquired and the problem of enabling the fishermen to exploit these fisheries is now receiving attention.

The Government have recently approved the proposal of the Director of Fisheries for conducting deep-sea and fishing experiments with a Yorkshire coble and have sanctioned the employment of a Yorkshire Master Fisherman on a pay of Rs. 400 per mensem and a staff of a driver and lascar on Rs. 30 and Rs. 17 per mensem respectively for a period of three years from 1st July 1936.

In inland waters the department has resumed the fishery rights in tanks, rivers, etc., in 16 districts of the Presidency, and these waters are regularly stocked with improved varieties of edible fish. To supply fish fry to these waters, fish farms have been established at seven places at Præma and Sunkesula in the Kurnool district; at Ippur and Mopad in the Nellore district; at Chingleput and Vellore Fort Moats and at Perambur. The function of these farms is to breed suitable varieties of edible fish for distribution to the adjoining provincialized waters.

The scheme of research for a central fresh water biological station and fish farm at the Chetput Brickfields, Madras, extending over a period of five years to be financed partly by the Local Government and partly by the Imperial Council of Agricultural Research is awaiting provision of funds by the latter. Their contribution has been promised in 1936-37.

Pisciculture.

Since 1930 attempts have been made to disseminate a knowledge of fish and fish culture applicable to South Indian Waters among ryots, in order to introduce fish culture as a cottage industry. The department's advice in this direction is being more extensively sought by private owners of tanks and wells each year.

Improvement of Fish Industry.

Fish-curing is an age-old industry in India, but the methods in use are generally primitive and capable of great improvement in regard to the flavour, appearance, cleanliness and keeping quality of the product. There are now 103 fish-curing yards in the Presidency of which 53 are on the West Coast and the remaining 50 on the East Coast. Improved methods of preserving fish devised at the Tanur Experimental Station have been introduced into the

industry, thus ensuring for the consumer a better article of diet and for the producer a better class and more extensive market. In order to encourage the fish-curing industry, duty free salt is distributed to the fish-curers.

Refrigeration being the only method available for keeping and distributing fish fresh, an inexpensive method of freezing fish in ordinary ice plants suited to the low-priced local market, which was devised, has been adopted by one or two private factories.

Fish Oil.

The fish oil and guano industry, which has given rise to 647 private factories since 1910 on the West Coast and is now worth over half a crore of rupees in good years and about ten lakhs on an average annually, owes its existence almost entirely to the research conducted by the department.

An allied industry, which has assumed considerable importance in Western countries since the War, is the manufacture of fish-meal for farm stock, and this has also been recently initiated in South India. Fish-meal manufactured in South India now finds a sale all over India and Burma.

The possibility of providing an efficient but cheap substitute for medicinal cod liver oil has just been discovered by a vitamin survey of South Indian fish oils. The lack of vitamin A being a vital problem in the proper nutrition of the masses, the discovery may prove of great economic and dietetic importance.

The unorganized state of the trade in fish and fish products received the attention of the department recently, on account of the economic distress among fishermen and curers. A system has now been devised by which the ruling prices in the different markets of the Presidency are published weekly for the information of the fish trader.

Education of Fisher Children.

Thirty-seven fisher schools, attended by 2,841 boys and 1,527 girls during 1934-35, are maintained by the department on the West Coast. In these schools, education is imparted free and instruction given of a special type, bearing on the fisherman's calling. The expenditure on the fisheries schools during the last five years is as shown below :—

	RS.
1930-31	56,669
1931-32	61,067
1932-33	67,264
1933-34	65,396
1934-35	65,080
1935-36 (R.E.)	72,100

These figures speak of slow but steady progress.

To provide teachers properly trained in fishery technics, a special training institute for teachers has been established at Calicut.

In response to the request made by the fisher communities of the Tamil districts, that the benefits of special education to fisher children should be extended to them, the first batch of teachers from fisher schools in the Tinnevely district has been admitted into the Fisheries Training Institute this year.

As the only suppliers of Indian biological specimens of direct educational value to schools, colleges and museums all over India and Burma, and by means of the Madras Marine Aquarium—the only institution of its kind in the East—the department gives a great stimulus to the study of natural history, an element which has been lacking in the educational system of the country.

Improvement of the material and moral condition of the Fisherfolk.

One of the duties of the Fisheries department has been to bring about the uplift of the fishermen community by means of education and the formation of co-operative societies. Since 1934, the officers of the Fisheries department have been working in collaboration with the Co-operative department in starting new societies among fishermen and in supervising them. At the close of the year 1934-35, there were 48 societies working on the West Coast, and 21 societies on the East Coast.

The officers of the department are also doing a great deal of social service among the fishermen to wean them from habits of intemperance, extravagance, etc.

Anti-Malarial Operations.

The breeding of mosquito-destroying-fish, an accepted method of combating malaria, has been undertaken by the department with gratifying results in a number of localities. To mention one instance, in the notorious malarial tract—the Nallamalais in the Kurnool district—springs have been annually stocked by the department since 1915. A recent investigation to ascertain the efficacy of the stocking operation has shown a marked decrease in the incidence of malaria.

Progress of the Co-operative Movement in the Madras Presidency.

In addition to advice and help given by the Agricultural department, assistance is rendered by the Co-operative department, which through Co-operative Credit Societies enables ryots to obtain credit for agricultural operations.

Concessions to Co-operative Societies.

The Government grant certain special concessions to Co-operative Societies:—

- (1) Co-operative Societies are permitted to settle their disputes by arbitration instead of through the civil courts. A special staff is provided for the execution of decisions or awards of arbitrators.
- (2) Co-operative Societies are exempt (1) from income-tax payable in respect of profits earned or dividends received by members, (2) from payment of the stamp duty with which instruments executed on behalf of such societies are chargeable, and (3) from half the registration fees payable in respect of such instruments.
- (3) Co-operative Societies are authorized to send remittances through Government treasuries by means of remittance transfer receipts at par.

Co-operative Credit Societies not only provide funds on advantageous terms but also exercise a moderating influence on all money-lending transactions.

Non-Credit Societies.

The department also aims at developing the co-operative spirit among agriculturists in making purchases and in the disposal of produce. These special types of societies in addition to helping the ryots in these ways generally also encourage the development of certain other non-credit activities among the ryots. Some help to disseminate knowledge of the latest improvements in agriculture by demonstrating on a common farm the utility of scientific and improved methods of cultivation, distributing seeds, manures and agricultural implements to the ryots. The Government maintain a special staff of Inspectors for the supervision of the non-credit societies and for the development of selected loan and sale societies in the Presidency.

Granting of Loans.

They have also undertaken to grant loans to Loan and Sale Societies for the construction of godowns or granaries where the members' produce can be stored and sold in a favourable market. These loans have not been popular, however. The Groundnut Loan and Sale Society in South Arcot has rented warehouses in suitable centres and is now doing valuable work. A similar organization exists in Coimbatore district in respect of cotton. It is the object of these societies to receive the produce of the cultivator and find a purchaser for the produce. The society gives the ryot credit for his produce at a standard weight which saves him from being cheated in weighing. If the ryot wishes to withhold his produce in the hope of obtaining a higher price, the agricultural or co-operative officer in charge of the warehouse of the society allows him to stock his produce in the warehouse, and when necessary, accommodates him with a loan from the Sale Society on the security of the produce.

The Government have also been giving financial assistance to certain weavers' societies for the employment of staff for marketing their produce.

A provincial society called "The Madras Handloom Weavers' Provincial Co-operative Society" has been started with the objects of organizing the handloom industry on a commercial basis in the Madras Presidency and of expanding the market for handloom fabrics. The Government of India have allotted to the Presidency Rs. 26,500 for 1934-35 and Rs. 59,500 for 1935-36 for the better organization and improvement of the handloom industry. These amounts will be utilized in subsidizing the Provincial Weavers' Society.

Co-operative Building Societies.

Their main object is to help middle-class people with loans for the construction of houses with a view to relieving congestion in towns. The Government give long-term loans repayable in 20 years at a reasonable rate of interest—the present rate is 5 per cent. The following statement shows the amount of loans advanced during each of the years from 1930-31 onwards :—

Year.	Amount of loan.
	RS.
1930-31	3,96,416
1931-32	1,30,750
1932-33	95,506
1933-34	1,26,278
1934-35	2,07,137
1935-36	2,75,000 (R.E.)

Co-operative Insurance.

The South India Co-operative Insurance Society was registered in 1932 with its headquarters at Madras. The object of the society is to provide the benefits of insurance to the middle and the poorer class of people including agriculturists. The progress made by the society since its inception is encouraging as will be seen from the following statement :—

Year.	Number of members.	Share Capital.	Proposals received.	Policies issued.	Premia received.
		RS.	RS.	RS.	RS.
1931-32	162	33,163	2,68,800	1,70,800	3,888
1932-33	605	41,111	6,10,800	4,62,700	22,582
1933-34	1,311	42,099	8,53,750	6,66,850	47,119
1934-35	2,226	44,464	11,77,100	8,62,850	84,151

Land Mortgage Banks.

Another feature in the recent development of the co-operative movement in the Presidency is the provision of long-time credit through land mortgage banks. The grant of co-operative credit on mortgage of land was started in 1925 when the Government approved the organization, as an experimental measure, of land mortgage banks on a co-operative basis in four selected localities in the Presidency. The primary object of the banks was the relief of agricultural indebtedness by providing long-term loans for the redemption of mortgages on agricultural lands and the discharge of prior debts not secured by mortgages. The improvement of land and of methods of cultivation was also within their scope. These banks were to obtain money from share capital, deposits and debentures.

It was found within two years of the establishment of these banks that the chief difficulty experienced by them was in selling debentures locally, in spite of assurances. The Government in October 1929, therefore sanctioned the establishment of a Central Land Mortgage Bank to float debentures on the assets transferred to it by the primary land mortgage banks and to finance the latter out of the proceeds of such debentures. According to the scheme debentures are issued by the bank up to 50 per cent of the value of the properties mortgaged to the bank. A Trustee, who is for the present the Registrar of Co-operative Societies, was appointed to see that the bank fulfilled its obligations to the debenture-holders. The Government have been helping the bank from the beginning in various ways in order to see that the scheme of land mortgage credit inaugurated by them was a success. They have employed a special staff, at their cost, for the inspection and appraisal of the mortgages tendered by the applicants. The banks have been slowly increasing in number every year and there are now 79 primary banks in this Presidency. A perusal of the figures below makes this clear.

Primary Land Mortgage Banks.

	1931-32.	1932-33.	1933-34.	1934-35.
1. Number of banks ..	38	57	64	76
2. Number of members ..	5,270	7,211	11,305	16,086
		(in lakhs of rupees).		
3. Share capital	2.29	2.99	3.76	4.93
4. Borrowings—				
Debentures	8.21	7.89	4.42	6.33
Deposits	0.81	0.65	3.33	0.47
Loans from Central Land Mortgage Bank	11.31	20.50	33.82	51.04
5. Reserve fund	0.19	0.24	0.31	0.35
6. Working capital	22.81	32.28	46.64	63.28

The Central Land Mortgage Bank may now be said to be firmly established. In 1934 an Act of great importance was laid on the Statute Book. Under this Act certain privileges are conferred on the Central Land Mortgage Bank. The Government have guaranteed both the principal of and the interest on the debentures issued by the Central Land Mortgage Bank, in order to make them attractive to the public and these debentures have been classified as trustee securities under a recent amendment of the Indian Trust Act. The land mortgage banks are now totally exempted from payment of registration fees.

Audit.

Audit is a statutory duty and therefore the Government through the Registrar are under a legal responsibility to ensure that all societies of every description are audited each year either directly by their own officers or by independent competent auditors. For this purpose a staff of audit inspectors under the control of the Registrar is maintained by Government. There was a controversy in regard to the devolution of audit on non-official agencies and in 1933, the Government on a full examination of the matter, considered that there was a strong body of opinion which took the conservative view in favour of the continuance of audit by Government agency and that therefore no extension of non-official audit should be permitted and that departmental audit should be the rule.

All agricultural credit societies receive free audit, while Central Banks and some of the big Urban Banks pay audit fees. After the decision referred to in the previous paragraph was arrived at, the question of the reduction in the scale of audit fees was considered and on the basis of the cost of the staff including leave and pensionary contribution, travelling allowance and contingencies and allowing a margin to cover any fall in receipts or increase in expenditure the Government decided in December 1935 to reduce the fees by 12½ per cent giving power also to the Registrar of Co-operative Societies to grant remission not exceeding another 2½ per cent at his discretion in deserving cases from the co-operative year 1935-36 onwards. The Registrar has been asked to examine the

question of the transfer of the audit to private agencies and to submit a report after the reduced fees have been in operation for some time, if the reduced scale of fees is still considered too heavy a burden for the societies to bear.

Supervision.

In June 1934, the Registrar explained the then position in regard to the supervision of societies and suggested that supervision should be undertaken by Central Banks assisted by local co-operative unions, which should not have powers of appointment, punishment or discipline of supervisors and that officers of the department should keep themselves in personal touch with the unions and stimulate them to exercise vigorous supervision. In March 1935, the Government accepted the suggestions of the Registrar.

The period covered by the recent quinquennium marks an important epoch in the movement. Policy of expansion has given place to one of introspection—a searching of the dark spots and elimination of centres of weakness. It cannot be said we have emerged from the stage of anxiety but we may well take credit that we have not refrained from acknowledging the weakness and setting out boldly to prevent further deterioration.

The period is also conspicuous for its activity in the field of legislation. The Co-operative Societies Act of 1912, an India Act, has been replaced by a Provincial Act with many important amendments and alterations to suit our local needs. Land Mortgage Banks Act is another piece of important legislation undertaken to place the land mortgage movement on a firm and solid foundation.

Special steps have been taken to stimulate and assist the non-credit activities, especially loan and sale societies.

In the matter of audit, we have made the Government audit the rule and have strengthened the audit staff and introduced the levy of audit fees.

The condition of weavers is being specially looked into and we have with the assistance of subvention from the Government of India promoted a Provincial Society which is now actively considering measures of relief to the handloom weavers.

We would also like to acknowledge the great services to the cause of co-operation of the not inconsiderable body of non-official co-operators. But for the conspicuous part they play the movement will cease to be a co-operative movement.

Progress of Veterinary Work in the Madras Presidency.

Cattle are the mainstay of the agriculturist. It has been well said that the working capital of the cultivator is mainly represented by his livestock. Losses of his cattle from disease, therefore, press hard on him and in our country contagious diseases take their full toll. To control such diseases is the outstanding duty of the Veterinary department of the Government of Madras.

The Veterinary department renders medical aid to such of the cattle as are attacked by disease or are otherwise rendered unfit for work. Veterinary aid is supplied by veterinary dispensaries, by itinerating Veterinary Assistants or by both methods. Veterinary hospitals and dispensaries have been established in important places. Touring Veterinary Assistants work within a certain specified area and carry veterinary aid to the very doors of the agriculturists. At the end of 1935-36, there were 112 veterinary institutions and 103 touring Veterinary Assistants, the corresponding figures for the year 1928-29 being 95 and 88 respectively. It is obvious that such a staff is inadequate. The number, however, could not be further increased owing to financial stringency. Further, the Retrenchment Committee was of opinion that no expenditure should be incurred on the opening of additional veterinary institutions and recommended that if any additional institutions were required, they should be paid for wholly or in part by the local bodies. Such also is the considered view of the Linlithgow Commission. Accordingly, one of the main considerations in the matter of opening new veterinary dispensaries in future will be the willingness and ability of the local bodies which serve the localities concerned to contribute towards the maintenance of the institutions. Similar considerations do not apply to increasing the strength of the touring assistants whose main duty is the control of contagious diseases. The Government are taking steps to carry out this policy.

Steady Decrease in Cattle Mortality.

Large numbers of cattle are dying year after year from one cattle disease or another. As a result of the efforts of the department, the number of deaths has been steadily going down as is seen from the figures noted below :—

Year.	Number of deaths.
1928-29	170,936
1929-30	158,523
1930-31	140,220

Year.

No. of deaths.

1931-32	56,634
1932-33	40,196
1933-34	31,774
1934-35	26,733

Prior to 1929-30 the Presidency was divided into seven circles for purposes of veterinary administration. In that year five additional circles were created with a view to allow District Officers more time to combat the severity of rinderpest, one of the dread diseases of cattle.

Serum-Simultaneous Method.

Rinderpest has been responsible for very large losses. After considerable experiment and research the Veterinary department has succeeded in discovering a remedy for it, viz., by inoculating cattle by what is known as the serum-simultaneous method of inoculation. The goat virus method of vaccination is also used to protect cattle in free areas against rinderpest. Not only cattle which are attacked by the disease are inoculated but also cattle not attacked by disease so as to make them immune to it. Owing to its efficacy it has been gaining in popularity and a large number of inoculations have been performed from year to year as will be seen from the figures noted below :—

Year.	No. of inoculations.
1928-29	83,049
1929-30	169,836
1930-31	147,880
1931-32	113,566
1932-33	101,115
1933-34	139,252
1934-35	115,130

One of the chief difficulties in the way of inoculating cattle has been that of obtaining adequate supplies of anti-rinderpest serum from Muktesar where it is prepared. It has not always been possible to comply with the full requirements of District Officers for serum. With a view to overcome these difficulties and to enable the department to combat rinderpest more effectively the Government of Madras have started a Serum Institute at Madras wherein anti-rinderpest serum is now manufactured. The cost of the serum is now much less and serum can be obtained whenever required.

Rinderpest Officer.

The Government having fully realized the dreadful nature of this disease considered it necessary to appoint a Special Rinderpest Officer. This the Government did in 1931. His main duty was to investigate into the methods employed to combat rinderpest, to

find out the correct dose of serum necessary to fight the disease and lastly to suggest measures to improve statistics relating to outbreaks of rinderpest and mortality. This appointment has given place to a Special Disease Investigation Officer who has been working since 1933.

Rinderpest, although the most formidable, is only one of the serious infectious diseases in India. Indian cattle are not immune from hæmorrhagic septicæmia and foot-and-mouth disease. Measures to control these diseases are also being taken.

Great attention has been paid to control of contagious diseases in Madras. As early as 1866 a Cattle Disease Act was passed. It has been in force since. Under this Act some effective action to check the spread of contagious diseases can and has been taken.

Familiarizing Ryots with Veterinary Work.

The department has been carrying on propaganda work on an intensive scale with a view to make its work more known to the ryots so that they may be more fully utilize its services. Each District Veterinary Officer has been supplied with a separate magic lantern apparatus. Magic lantern slides on common contagious diseases and parasitic diseases of animals and charts and diagrams on veterinary matters are being supplied to the districts for propaganda purposes. The department participates in the Health and Baby Week shows and exhibits various items of popular and scientific interest. Advantage is taken of cattle fairs and exhibitions to conduct magic lantern demonstrations and popular lectures. Leaflets on some of the important diseases of animals prevalent in the Presidency are distributed free to the ryots. Attempts were for a time made to make use of the Agricultural department motor van to conduct lectures and to give demonstrations. Towards the close of 1934-35 the motor lorry attached to the office of the Director of Public Health was transferred to the Veterinary department for propaganda purposes. With the aid of this lorry it is hoped that the department will be able to carry on propaganda work on a more intensive scale and familiarize the ryots in veterinary matters in a much shorter period than it would otherwise be possible. The Veterinary department also participated in the Rural Development Scheme for the Tiruvallur taluk of the Chingleput district organized by the Public Health department. A Veterinary Assistant was placed on special duty. Besides attending to the socio-economic survey of the area and collecting the necessary data for the livestock survey report the Veterinary Assistant carried out propaganda work.

A New Method of Castration.

Bulls have been and even now are to a certain extent castrated in an antiquated way which is brutal and causes cattle considerable pain and anguish. Further, after castration they become unfit for work for about a fortnight. The Veterinary department has been advocating castration by means of the Burdizzo method. The

operation is carried out in a very short time without any pain to the animal and the animal can be taken to work immediately. As a result of propaganda work the ryots are taking to it rapidly. As many as over half a lakh of cattle are so castrated every year.

The Imperial Council of Agricultural Research have sanctioned a scheme for the appointment of Veterinary Investigation Officers in all the provinces of India for a period of five years. The scheme provides for a grant of Rs. 10,000 a year to each province. In Madras the work of investigation had already been undertaken by the Local Government. With the help of this grant, a Special Officer was put on investigation into contagious diseases other than Rinderpest, the Special Rinderpest Officer having completed his work on this disease. This work which began in 1933 is proceeding satisfactorily.

Training Veterinary Assistants.

To train Veterinary Assistants, the Government of Madras runs a Veterinary College to which persons from several parts of India resort. Until the year 1929-30, the course at the College ran for two years and qualified a candidate for a diploma. In accordance with the recommendations of the Royal Commissions on Agriculture the course was converted from 1st July 1930 into a three years' course. In July 1936, the Madras Veterinary College became affiliated to the University of Madras. A degree in veterinary science (B. V. Sc.) has since been instituted. Attached to the College is an up-to-date hospital wherein an X-Ray apparatus has been fixed. At the college a refresher course lasting for nine months is also given. This keeps the knowledge of Veterinary Assistants up to date.

Industrial Progress in the Madras Presidency.

The activities of the Department of Industries include the encouragement of the development of industries directly and indirectly, and the supply to the public of general and statistical information on industrial and commercial subjects. It is now the recognized function of the Director of Industries to collect and present statistical and other information in regard to prices and the commerce of the Presidency.

Direct encouragement is afforded by (1) the State pioneering the industries, e.g., the Kerala Soap Institute and (ii) by giving financial and other assistance to private enterprise in starting industries. The State-Aid to Industries Act, it is well known, has not fulfilled the expectations of its framers, and the question of amending it so as to make it more effective is at present under the consideration of the Government.

Industries are assisted indirectly by (i) giving industrial and commercial information to the public, (ii) conducting experiments with a view to effecting improvements to existing industries, e.g., research at the Leather Trades Institute, Madras, experiments on oil technology at the Kerala Soap Institute, Calicut, and (iii) providing trained artisans. The department also pays great attention to the problems facing the agriculturists. Over 75 per cent of the population is agricultural and dependent upon cultivation, and the department assists agriculturists to secure an assured supply of water, the essential necessity for the carrying on of successful cultivation.

Assistance to Agriculturists.

The main object of the pumping and boring operations conducted by the Department of Industries is to render assistance to agriculturists with a view to increasing the agricultural wealth of the country. The tapping of underground water to provide irrigation facilities for the ryots may be regarded as the chief function of the Engineering section of the department, and over a period of years it has done much in the direction of providing adequate supplies of water to assist the cultivation of crops. The boring operations by means of which this water is secured are by no means confined to mere sub-soil digging, and it is a common experience for borings to be taken to depths of 300 to 500 feet below the ground level in order to secure an adequate flow. In a large number of cases adequate supplies of water have been assured to cultivators

and lands which would otherwise have plain waste have been converted into fields smiling with paddy and sugarcane to the considerable economic advantage of the ryots, of the areas in which the operations were conducted.

The Engineering section puts down trial borings before wells are sunk, thus in many cases preventing a waste of money; puts down borings in existing wells to enhance the water-supply; lends pumping plants for well-sinking and irrigation purposes; undertakes the erection of pumping plants as well as of small industrial plants; and attends to the periodical inspection and overhaul of these plants. The assistance rendered by the department in arranging for the periodical inspection and overhaul of pumping and industrial plants for a nominal annual fee in areas where no trained mechanical assistance is available, has contributed not a little to the success of these installations. As a result of investigations carried out by the department several powerful artesian borings have been put down. These borings are characterized by the spontaneous discharge of water above ground level, and they have transformed several hundreds of acres, which were previously either fallow or dry, into good wet lands.

The department has to its credit over 97 artesian borings tapped in the northern and southern parts of the Presidency, and as a result of the tapping of these springs, the value of the land benefited thereby has increased considerably. Assistance is also rendered to public bodies in tapping pure potable drinking water in connexion with rural water-supply schemes intended to benefit the public and it is estimated that as a result of the putting down of boreholes for this purpose in the Tanjore district during the last few years, good drinking water is now regularly supplied to about 50,000 people. There is an increasing demand for assistance in all these directions. The number of feet bored during 1935-36 was 60,737 against 40,872 in 1928-29. The size of the bore-holes now ranges from 6" to 10" as against 4" to 6" formerly, the development of boring practice recently having been in the direction of larger and deeper borings.

Loans to Ryots.

Loans under the Land Improvement Loans Act are granted by Government on favourable terms to ryots for the installation of pumping plants where there is a reasonable prospect of increased cultivation and a return on the capital expenditure incurred. The amount disbursed during the last five years was Rs. 1,09,000.

The department also maintains a small number of power-driven sugarcane-crushing mills which are hired to the public for crushing their sugarcane. These mills serve to demonstrate the advantage of power cane-crushing mills over bullock-driven appliances. The manufacture of sugar by the open pan system with centrifugals has also been demonstrated to the public in several areas, and centrifugal machines are available for hire to the public for a nominal

rent. A demonstration of white sugar manufacture from palmyra juice with the aid of centrifugals was conducted at Rettakulam in the Tinnevely district, and it has been demonstrated that good marketable white sugar can be prepared from palmyra juice by the open-pan system, and that the molasses obtained in the process can be converted into jaggery by re-boiling with fresh juice. It has also been shown that it is possible to prepare from palmyra juice a higher quality of jaggery than is at present being prepared in the district. A further demonstration of the manufacture of white sugar and improved jaggery from palmyra juice has been carried out recently at Bhimavaram in the West Godavari district, and arrangements are in progress to organize co-operative societies of tappers to manufacture improved jaggery, and possibly later on of white sugar, in the West Godavari district.

Industrial Education.

Industrial education, which constitutes an important activity of the Department of Industries, is receiving adequate attention. The Government are maintaining the following institutions :—

The Government Textile Institute, Madras.

The School of Arts and Crafts, Madras.

The Government School of Technology, Madras.

The Government Industrial Schools at Madura, Calicut and Bellary and the Government Trades School, Mangalore.

In addition, 74 private industrial schools are recognized and aided with grants. The Government through the department are also encouraging the establishment of industrial schools by Municipalities and District Boards, and are giving them the necessary technical advice and guidance. They are also awarding a number of scholarships tenable in British and Indian Universities and technical institutions. In view of the development of the sugar industry in the Presidency and the necessity of providing for the training of sugar technologists, a number of scholarships in technology tenable at the Andhra University, Waltair, have been instituted. Under the provisions of the Code of Regulations for Industrial Schools, 60 scholarships tenable in aided industrial schools or classes where provision exists for the instruction of apprentices and learners in subjects likely to prove their value as workers, are awarded annually. These scholarships are found to be of considerable assistance in enabling needy students to remain long enough in training to acquire something more than the rudiments of a trade.

Government Textile Institute.

The Government Textile Institute, Madras, constitutes the main agency of the Department of Industries for improving the cottage textile industry of the Presidency. The Institute affords instruction on up-to-date lines in the weaving, dyeing and allied processes involved in the manufacture of fabrics from cotton, silk, wool, etc. It is well equipped for the purpose and provides two courses of

instruction—the supervisor course and the artisan course, besides a special course in cotton power spinning for the benefit of mill apprentices. The training afforded to the pupils in the artisan course is entirely of a practical character, and is intended to turn out competent craftsmen. The supervisor course is designed to impart a comprehensive, theoretical and practical training to candidates who aspire to take up responsible positions in the textile industry. In order to afford some help and encouragement to deserving candidates seeking training in the institute, a system of scholarships has been sanctioned by Government. For rendering assistance to the handloom industry on the business or commercial side, the Government have, with the aid of a subvention from the Government of India, and through the Department of Industries brought into existence the Madras Handloom Weavers' Provincial Co-operative Society, Limited, for developing co-operative buying and selling on behalf of the handloom weavers, with a number of district primary societies linked to it, and for the introduction, on a co-operative basis, of small units for preparing and distributing ready-made warps for the looms, and for the setting up of a power-driven finishing plant so as to permit of the finishing of hand-woven cloth, and of the creation of an increased demand for such cloth. When the Provincial Society was established, there were 29 primary weavers production societies in the Presidency, but many of them were not engaged in actual production, several were dormant, and others were on the verge of liquidation. New societies have been organized, some societies revived, and some of the existing weavers credit societies converted into weavers production societies. There are now on the rolls of the Provincial Society, 43 registered societies, which are engaged in production, and subsidies have been sanctioned to 85 societies in order to meet their administrative expenses. These societies are being assisted in regard to the supply of yarn and the marketing of their finished products. In order to popularize hand-woven cloth among the wholesale dealers and the public, and to find an outlet for the cloths produced by the primary weavers societies, an emporium has been opened at Madras, whilst the question of opening sales depots at some other centres is under consideration.

School of Arts and Crafts.

The School of Arts and Crafts, Madras, aims at the encouragement of Indian arts so as to develop the artistic sense of the people, and of industries which have an æsthetic value and at the same time, satisfy utilitarian purposes. Fine Arts have a definite cultural and social value, and this section of the school affords training in painting and modelling. In the crafts section, instruction is provided in cabinet making, engraving, jeweller's work, silver-smithing and metal work, designing, enamelling, lacquering, cotton printing, etc. A number of school stipends are given, whilst the Labour department and other public bodies and Indian States award scholarships to the students of this institution.

School of Technology.

The object of the Government School of Technology is to meet the requirements of the industries of this Presidency in regard to foremen, mechanics, electricians, printers, and plumbers. It affords instruction in Mechanical Engineering (five years course), Electrical Engineering (four years), Printing (five years), Plumbing (two years), Electrical Wiring (two years), and Machine Drawing course for wood-workers, metal-workers, and bricklayers, masons and plumbers, each of two years' duration. Three different printing courses have also been organized, one for compositors and proof-readers, one for machine-minders, and the third a diploma course. The school has now a strength of over 1,000 students—sufficient evidence of its growing popularity. Admission is restricted to bona fide apprentices and workmen who are actually engaged in the trade which they wish to study, and a small tuition fee is levied. With a view to encouraging deserving poor students who are not in a position to prosecute their studies without outside financial aid, Government have instituted the award of twelve scholarships tenable for a period not exceeding five years. In addition to this, the Labour Commissioner also awards some scholarships to depressed classes pupils whilst a few charitable institutions are also awarding some scholarships to deserving pupils.

Industrial and Trades Schools.

The Government Industrial and Trades Schools provide regular courses of instruction in the wood-working and engineering trades, the duration of each course being five years. These schools turn out skilled artisans of a type for which there is likely to be an increasing demand. No tuition fee is levied, but with a view to helping deserving poor pupils, stipends are awarded by Government to one-third of the number of pupils admitted in each industrial school. In addition to this, local bodies have also instituted a few scholarships.

Leather Trades Institute.

The Leather Trades Institute, Madras, now functions as a centre for the provision of general advice, research and practical guidance to tanners and for the conduct of analysis for the tanning trade. In view of the importance of the tanning industry, the Government have recently sanctioned the appointment of a Tanning Expert. It is proposed to undertake a thorough examination of the conditions under which the tanning industry is carried on with a view to introducing improved methods of flaying, preserving and tanning. There is undoubtedly great scope for improvement in the methods adopted in country tanneries throughout the Presidency and if improvement could be effected in certain directions the benefit to the economy of the Province in the shape of higher export values for hides and skins would be considerable.

The Kerala Soap Institute.

The only pioneer factory at present under the control of the department is the Kerala Soap Institute, Calicut, which has more than fulfilled the purposes for which it was originally started, a large number of soap factories having come into existence throughout the Presidency as a result directly or indirectly of its establishment and example, and a number of students having been trained in it in soap manufacture. The purpose of the Institute is now primarily to impart instruction in soap making and allied industries, and to carry out experimental and advisory work in the sphere of oils and fats. The institute maintains touch with most of the ex-students after the completion of their training and their requests for advice and assistance are readily complied with, whilst in the course of his tours the Superintendent visits and inspects the local soap factories, and advises the owners, many of whom are ex-students of the institute how to improve their methods and products. Experiments have been initiated in the institute on the refining, deodorizing and blending of vegetable oils, and the results of these are made available to those interested in the development of this branch of the oils and fats industry. The desirability of doing everything possible to encourage and stimulate the industrial utilization of Indian vegetable oil-seeds as a raw material in the Province itself, has been recognized by Government, and a scheme for the preparation on a laboratory scale of toilet creams, brillian-tines and dentrifices has recently been sanctioned, whilst the experimental manufacture of other products is under consideration.

Sericulture.

The silk industry is receiving increasing attention at the hands of the department. The Kollegal taluk of the Coimbatore district is the only centre where the rearing of silk worms and the reeling of cocoons are conducted on an intensive scale, but demonstrations in the cultivation of mulberry, the rearing of silk worms, and the reeling of silk, are carried out from time to time in other suitable parts of the Presidency by the staff of practical demonstrators. Four silk farms are maintained by the department at Coonoor, Hosur, Palmaner and Thadgunhi, and one at Vedakangulam in the Tinnevely district is assisted. Seed cocoons are raised in these farms for distribution to Kollegal rearers in the shape of disease-free layings. A number of moth-testers are employed in order to test in the houses of the rearers the seed cocoons purchased by them and subsequently to supervise the rearings. In order to supply disease-free seed to the rearers and to maintain the vitality of the worms, the department also purchases seed cocoons which are produced in localities other than Kollegal and sells the disease-free layings to the rearers at a nominal price. A silk demonstrator is engaged in demonstrating improved types of reeling machines with a view to improving the cottage reeling industry. The Coonoor farm is maintained chiefly for the purpose of carrying on cross-breeding experiments with different varieties of silk worms at a

higher altitude, in order to supply good hybrid seeds to the rearer, so as to keep up the vitality of the worms and thus increase the silk content of the cocoons. Experiments are also conducted at this farm with a view to increasing the leaf supply of the mulberry plantations by cultural and manurial methods. The Government of India have given a grant for the purpose of increasing the production and supply of disease-free cellular seed to the silk-worm rearers of the Presidency, and for the conduct of research on silk-worm diseases. This scheme has recently been given effect to. A recent development in sericulture has been the preparation of gut from mature silk-worm glands.

Cottage Industries.

In 1927, the Government appointed a special officer to make a detailed survey of the cottage industries in the Madras Presidency to devise means for the revival and extension of rural industries on an economic footing and for the organization of subsidiary occupation for the agriculturists. It has not been possible to give effect to some of the proposals for the development of cottage industries owing to the adverse financial conditions; but the development of the following industries has been assisted in one form or another, viz., button-making, bee-keeping, basket-making, cane and mat-weaving, chank shell working, coir working, embroidery, hand-made paper making, metal working, palmyra leaf working, slate and toy manufacture, etc. In view of the importance of developing cottage industries, the Government accepted the offer of the Council of the Victoria Technical Institute, Madras, to arrange for the sale of Madras cottage industries products in European markets through an agent in London, and accordingly sanctioned a grant of Rs. 3,000 per annum to the institute for a period of three years from 1934-35. Business is being regularly transacted with the agent, and it is hoped that over a period a substantially increased demand for the products of the cottage and small scale industries of Madras will eventuate. In order to permit of the development of the palmyra leaf basket trade, steps have been taken by the department to introduce improved methods of dyeing the leaves, with fast colours, and it is hoped that these efforts will result in improved business with the London market, and in increased employment for the basket makers. Attempts are also being made to develop a satisfactory export trade with the United Kingdom, and other countries, in hand-woven fancy textiles.

The Government examined the feasibility of adopting measures calculated to render aid under the State Aid to Industries Act more readily attainable by cottage and small scale industrialists, and they amended the Act and the rules in respect of small and cottage industries. In the case of any industrial business or enterprise with a capital outlay not exceeding five hundred rupees, Government have ordered that it is not necessary, unless the Director of Industries for special reasons otherwise directs, to insure the properties mortgaged to Government against loss or damage by fire. At the instance of

the Local Government, the Government of India exempted from payment of stamp duty, mortgage deeds securing the repayment of a loan advanced under the State Aid to Industries Act to a cottage industrialist or to the owner of a small concern, the capital outlay of which does not exceed one thousand rupees. The Government have further directed that in the case of applications for encumbrance certificates made by the department in respect of such industries, when the amount of loan applied for under the Act does not exceed rupees seven hundred and fifty, the Industries department shall pay the fees therefor according to the ordinary rate prescribed in Article 13 (2) of the Table of Fees governing encumbrance certificates. Up to the present, loans aggregating Rs. 8,77,915-8-0 have been granted under the State Aid to Industries Act.

Definition of "Cottage Industries."

The Government have recently liberalized the definition of "Cottage Industries." Before 1936 a cottage industry was defined as "Industry carried on exclusively for the benefit of, and by, workers in their homes and not industries carried on for the benefit of middlemen, though the workers happen to work not in factories but in their own cottages."

To-day it stands for "Industries carried on by workers in their own homes as distinct from those carried on in factories."

It is hoped that as a result of this widening of the definition of the term "Cottage Industries," it will be possible for many cottage industries in the Presidency to avail themselves of the facilities afforded under the Act. A list of the principal cottage industries which are eligible for aid under the Act is given below. The list is merely illustrative and is in no sense exhaustive.

1. *Textiles*—Cotton industry—Hand-spinning, hand-weaving, carpet-weaving, etc.
 Silk industry—Sericulture, reeling, spinning, weaving, etc.
 Woollen industry—Carding, spinning, weaving, etc.
 Other fibres—Coconut, aloe, hemp, jute, etc., rope, string, mat, etc., manufacture.
 Dyeing and calico printing, e.g., curtains, bed covers, table cloths, etc.
2. *Tanning and leather manufacture*—Tanning, leather dressing, manufacture of leather articles, e.g., shoes, boots, suit-cases.
3. *Soap and oil industry*—Vegetable oils, manufacture of soaps and perfumes, soap.
4. *Metals*—Brass and copper—Manufacture of domestic vessels by moulding, brass fish and insects, brass jewellery.
 Iron, steel and minor metals—Implements, tools, locks and safes.

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5. *Wood, cane, bamboo, reeds, etc., industries.*—Toys, wood turning, carving, bamboo and cane furniture, baskets, etc., coconut shell carving, palm leaf baskets, and the like.

6. *Ceramics.*—Glass bangles, domestic pottery, coloured and glazed pottery, earthen toys, etc.

7. *Food industries.*—Flour grinding, bakery and biscuit manufacture, confectionery, jam and condiments, cigars, and cigarettes.

8. *Industries of dress, toilet and luxury.*—Tailoring, knitting, linen embroidery, crochet lace, pillow lace.

9. *Minor industries.*—Engraving, musical instruments, spectacles, enamelling, ivory articles, slate manufacture, horn combs, etc.

Ceramic Industry.

A ceramic survey of the Presidency was initiated in 1930-31. The survey included an investigation of the location and character of the raw materials available for use in the ceramic industry, the extent of the deposits, their commercial value and the facilities available for quarrying and transporting them. The results of the survey which were published for general information go to show that there are distinct possibilities of developing the manufacture of certain branches of the ceramic industry, as valuable deposits of china clay and felspar have been discovered while other raw materials required for the manufacture of porcelain and other ceramic goods such as stoneware, drainage pipes, electric insulators, etc., are available in sufficient quantity. The question of the further steps that could suitably be taken to develop the industry is now engaging the attention of the department.

Industrial Research.

Although there is no research institute attached to the Department of Industries, research work is carried on to some extent by the chemists of the department on problems of importance to the industrialists of the Presidency. The staff of the Kerala Soap Institute, which has already been referred to, undertake research work generally on oils and fats, soap and allied subjects, whilst the Leather Research Chemists attached to the Leather Trades Institute undertake work on problems connected with the leather and tanning industry mainly and also on other subjects as necessity arises. The Local Government have been paying for some years an annual subvention of Rs. 5,000 to the Indian Institute of Science, Bangalore, and some of the chemical problems arising in the course of administering the department are referred to the institute. A number of special investigations have been carried out by the department during the last few years, e.g., the development of the coir industry, the cashewnut industry, sunn-hemp retting and the bleaching and curing of ginger, etc. The department has in particular been giving close attention to the development of

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the sugar industry in suitable areas of the Presidency and half a dozen factories have been established (some of them on co-operative lines) under the guidance of the department. There is still scope, however, for the setting up of additional factories in the Madras Presidency.

The necessity of accelerating industrial development and of approaching the problem of unemployment by the adoption of a policy calculated to increase the national dividend of the Province is fully recognized by Government, and all possible steps are being taken to this end. The possibility of establishing several important large scale industries, and of organizing new small scale industries has been opened up by the advent of electric power in certain areas of the Presidency, and much time and attention has been devoted during the last two or three years by the Department of Industries to the possibility of establishing new chemical and other industries, especially in the Mettur area. The establishment of industries of basic and fundamental importance, such as those which are in process of establishment, or are under investigation, will render possible and greatly facilitate the setting up of many medium or small scale industries, the finished products of the former functioning as raw materials in the processes employed by the medium or small scale industries.

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