

Ref. (5)

Report of a Town in the
Huddersfield and North Area
Dist.



21.3.16
479
2540

A TOUR IN THE CUDDAPAH AND NORTH ARCOT DISTRICTS.

From C. BENSON, Esq., M.R.A.C., Acting Superintendent of Government Farms, to C. A. GALTON, Esq., Acting Secretary to the Board of Revenue, dated Saidapet, 20th September 1879, No. 1,092.

I HAVE the honor to submit the following report of the tour in the Cuddapah and North Arcot Districts, performed under the instructions conveyed in the Board's Proceedings, No. 1,953, dated the 7th July 1879, from which I have recently returned.

2. I left my head-quarters here on Saturday, August 2nd, reaching Cuddapah at the same night. During the next three days I devoted my time to investigating

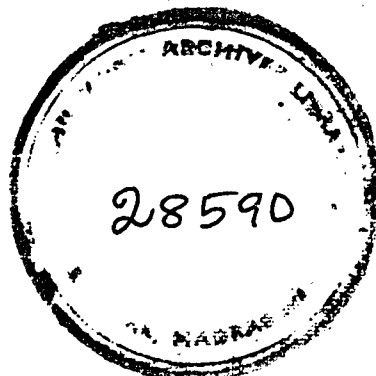
the systems of cultivation carried on in the neighbourhood of the town, after which I marched north to Khazipett on the Kurnool road, where I saw some of the cultivation under the Irrigation Company's Canal. From thence I returned across the Pennar to Kamalapuram, and from that place proceeded on the 11th by rail and road to Jammalamadugu, one of the cotton-growing localities of the district; but whilst there I was not able to see much of the neighbourhood, being, for three of the days I was there, laid up with fever. After leaving Jammalamadugu I returned by a different route to Muddanur, proceeding *via* Gundikota and Kondipuram. From Muddanur I returned to Cuddapah on the evening of August 16th, and left again for Rayachoti, which I reached on the morning of the 18th, and thence proceeded to Madhanapalle, halting at Guramkondah *en route*, reaching that place on the 23rd. After seeing the neighbourhood I left on the 27th for Palmanair, where I remained two days, and then marched down to Gadiyatam, whence I returned to Saidapet on September 1st as already reported. On the 28th August at Palmanair I received G.O., No. 1,728, dated the 19th August 1879, directing that my tour should be postponed.

3. I travelled during my tour the following distances:—

	By Rail.	By Road.
To and from the district	257	12
Movements of camp	69	190
Visits villages (about)	...	40
Total	326	242

In all the distance travelled, excluding visits to villages, the distances of which I am unable to give accurately, was 528 miles. The district is in many parts a hilly one, abounding in ghats, and a most expensive one to travel over, and the similarity of many large contiguous tracts obliged me to make some very long marches. The effects of the climate on the establishment I had with me have been serious, for none of them have escaped bad attacks of fever, whilst out of the eighteen office days since his return my clerk has only been able to attend on eight owing to the state of his health.

4. Owing to the short time at my disposal it was not possible for me to see nearly the whole of the district, and for that reason I am unable to submit a full report treating of the agriculture and agricultural conditions of it as a whole, and I shall confine myself to a few observations on the different localities which I visited, and the farming pursued in them separately.



J.2113 of 21611 M79
M79

5. *Cuddapah Taluk*.—In the neighbourhood of the town of this name the cultivators prosecute a system which is most commendable; in fact, the farming thereabouts is by far the best with which I have become acquainted in this country. The soil generally prevalent is a fine free loam, which, with water and manure, may be brought to any pitch of condition, besides possessing great natural fertility. The adjacent town affords large supplies of manure, which are largely made use of and are carted out for considerable distances around it, some being carried, I was informed, as far as Chennur on the banks of the Pennár, 8 miles from Cuddapah. The large

Advantages of soil and position. number of wells, together with the tanks which exist, furnish a good supply of water, which in the case of the wells does not require to be lifted very high, the water-level being usually near the surface. Thus, with a favorable soil and advantageous conditions as regards the supply of water and manure, it would be a mark of the greatest possible want of appreciation on the part of the Cuddapah ryots if they were not able to flourish in their highly-favored valley.

6. Besides, however, the favored nature of the situation, other causes must have been at work to cause the Cuddapah ryot to be a so much better farmer than the ryots of other parts of the same district. One cause can, I think, be found in the extremely high rates of rent which the land in the neighbourhood often bore until a recent date. Having to pay a High rent the prime cause of the good farming. rent varying as high as Rs. 35 per acre in some cases, it was only possible for the ryot to make both ends meet by high cultivation, and this has been adopted in many instances; whilst finding that by pursuing a good system on land for which he had to pay a heavy rent the produce of it was very much increased, and yet gave him a good return for his expenses, the ryot has been led to apply the good points of his system to all the lands he holds. By this means, what at first appears to have been a heavy rent has probably been in some degree the cause of the improvement of the local agriculture. A very similar result has also, I believe, occurred around Tinnevely in the valley of the Tamrapurui under a similar influence of high rents.

7. Whilst making this suggestion, as an explanation of the facts observed, I must of course defer to greater local experience, which might show the causes to have been other than that named, but it points to a conclusion that much land in this country could bear a heavier rent to the improvement of its agriculture. High rents and good farming are usually found to exist together as long as the rent is not excessive or more than the land can actually bear.

8. The extreme localisation around Cuddapah of the better class of farming is remarkable, and shows how little such Practices localised and not adapted to varying conditions. practices have any tendency to diffusion throughout the country, unless some pressure is felt by the ryots. A slight difference of soil apparently bars the way to the adaptation elsewhere of any of the practices pursued even in the immediate neighbourhood, and which have been conclusively proved to be remunerative. A difference of soil of course necessitates a change of the details of practice, but the broad outlines and principles remain the same.

9. It has been suggested that the reduction of the rent will lead to a deterioration of the agricultural practice, but as there has in a great degree been rather an equalization than a reduction, this is not greatly to be feared. Besides, the self-interest of the ryot stimulates his endeavors to cultivate his land in the method he has found profitable under adverse circumstances. Certainly lazy ryots, if they find that they can get a sufficiency for their wants without the exertion they have been accustomed to, may gradually become careless and wasteful, and so their practice may deteriorate. The force of custom, however, which is the greatest obstacle to progress in this country, is likely in this case to be an agent for good as preventing any retrograde movement.

10. On the irrigated lands, of which there is a considerable area, the chief crops are paddy and indigo, grown in a sort of rotation, thus: indigo is not grown more than once in three years on the same land, paddy and other crops filling up the intervening period. In the case of paddy the system of cultivation is very similar to that pursued in other parts of the Presidency. The seed is almost always sown broadcast in the "puddle." Leaf manure is extensively used, 5 to 10 cart-loads, or about 1 or 2 tons per acre being a common application. Water is as usual kept on the fields continuously during the growth of the crop, and thus much more is used than is necessary. After reaping the crop, it is kept in the sheaf for a short time, and then threshed out in the usual way by cattle. Indigo refuse (from the vats) is also extensively used for this crop, none of it being lost; this is very good practice, and makes the crop (indigo) a valuable restorative one, and thus enhances the value of it over and above the direct profits obtained from the production of the dye.

11. In the case of indigo on the irrigated lands the crop is not grown more than once in three or four years; it is sown after harvesting the cold weather paddy crop; the amount of seed used varies from about 20 to 40 lb. per acre, according to the quality of the soil, the richer soils of course requiring less seed. The seed is always broadcasted, which, with a crop of this nature, is a mistake, although perhaps in a measure unavoidable from the state to which the land is reduced during its preparation, which renders it too sticky for the free passage of a drill. The crop is only weeded once during its growth, and the state of many of the fields I walked through was extremely foul, the crop being nearly ready for cutting. Only one cutting is obtained on this land, which, although very bulky, does not yield well as regards the outturn of dye, and consequently sells at a much lower rate than the more slowly grown crop of the unirrigated lands. This is what might be expected from the rapidity with which the plant grows under irrigation, and the consequent watery nature of the produce. After reaping the crop, the stubbles are allowed to sprout afresh, and are then ploughed in, thus affording a green Crop made good use of. manure to the land. This crop is therefore turned to nearly full account, although in some of the details of its cultivation there is room for considerable improvement. The only thing that appears to be wasted is the water used in steeping the plant; this water is valuable as a manure, containing a considerable quantity of the soluble substances, salts of potash, &c., found in the leaf.

12. Indigo is also largely grown on the unirrigated lands, but there is nothing very remarkable in the treatment of the Indigo on unirrigated lands. crop. It is alternated with the ordinary cereal crops, and thus forms part of a rotation. It receives a small amount of manure, and is cut several times during the year. Occasionally it is kept down for two years on the same land. The land under the crop at the time of my visit was full of grass and generally dirty.

13. Scattered throughout the irrigated and unirrigated fields are very numerous wells; these afford the ryots of the Crops grown under wells. locality a means of keeping their lands constantly under crop, which, with the supplies of manure they obtain from the neighbouring town, is possible for them to do. Amongst the crops growing whilst I was at Cuddapah there was a large area of korra (*Panicum Italicum*), a four months' crop, which only requires occasional irrigation. It is sown broadcast. Cholum (*Sorghum vulgare*) is also grown to a considerable extent, and during its growth receives a species of interculture by driving the native plough across the rows of the crop, after which the earth is heaped up around the roots of the plants. Cumboo (*Pennisetia spicata*) and raggi (*Eleusine corocana*) are also grown on the same lands as the crops already referred to; they are either garden lands, or irrigated lands which have a constant supply of water from some source—canal, tank, or well.

Turmeric (*Curcuma longa*) is also grown to a considerable extent in patches on lands of the nature last referred to. This crop demands good treatment, but when cultivated properly is, to the ryot, a profitable one. It requires the expenditure of a large amount of manual labor, which of course the ryot himself can provide, and brings in a large return.

14. The practice of cutting cholam green for fodder for cattle is not unknown in this locality, although it is not extensively practised as far as I could discover, being chiefly adopted when there appears to be no likelihood of the crop producing a good crop of grain.

15. The abundance of fuel in the neighbourhood also prevents the use of bratties extensively for fuel, so that the soil receives a good deal of what is removed from it by the crops raised.

16. North of the Pennar in the neighbourhood of Khazipett, where I halted, I visited some of the land which is under the Irrigation Company's Canal, where the soil is a black clay, naturally of high fertility, capable of withstanding severe droughts, and only needing thorough and deep cultivation to render it almost indifferent to the ordinary failures of rain from which we periodically suffer. I visited this locality at the particular request of the Collector, as the Canal Officers frequently complain of the ryots not taking the water they bring.

17. That the ryots do not take the water is, I consider, a mark of their intelligence and knowledge of the nature of the soil they have to deal with. A stiff clay soil, of considerable depth, provided with drainage to carry off the surplus water neither naturally nor artificially, is, it is scarcely needful to remark, not suited for irrigational purposes, except under the most careful management, and in cases of the failure of rain. For paddy cultivation the soil is not at all adapted. When also it is remembered that the ryot of this part of the country is accustomed to live upon grains grown by the aid of falling rain only, and that to him a crop of paddy is so much produce that he must sell, and after sale purchase his means of subsistence from the proceeds, it is natural that he should abstain from converting his ancestral lands into a pestiferous paddy swamp. Again, the cattle, which are common in the locality, are not well adapted for the cultivation of paddy according to the native system; they are by far too large and clumsy for use in the small beds, in which alone the ryot finds it convenient to raise his paddy crop; and, as the ryots observe, they require a breed of small, wiry, light bullocks for work of the sort; such a breed does not exist in the locality.

18. Again, such ryots as have attempted the cultivation of paddy on such soil as I refer to—what is usually called "black cotton soil"—have learnt by experience the ill-advised nature of their attempts. In the first place the expenses of reducing the land to the perfect level which is essential for native paddy cultivation are heavy, probably about Rs. 20 at least per acre, and when the crop is sown and reaped it may, and usually does for the first year, raise delusive hopes of large profits in the future. Such hopes are raised only to be destroyed. In the second year it is found that the crop does not thrive so well, and that more work is required. By the time the third year comes round the effects of deluging an almost impervious clay with water are well marked; and the wretched ryot, who now has to pay an enhanced water-rate, finds that his lands are becoming what is locally called "Psoudu," i.e., saturated with the soluble salts drawn up from below, or left by the water used in irrigation.

19. If ever the canal is to be a success in tracts where this clay soil exists to any large extent under the conditions I have noticed—

- (1) The habits of the people must be changed.
- (2) A new breed of cattle must be introduced.
- (3) The existent soil must be changed in its character, or otherwise treated, to render it fit for irrigation.

20. If the ryots be induced to take the water offered them by any means, the results to be expected at present are on this clay soil—

- (1) The growth of a crop, which will be exported, and so the markets for the usual food-grains of the people will have to be supplied from elsewhere, and consequently at a higher price.
- (2) A deterioration in the farming practised.
- (3) The probability of, after a few years, large areas of land being thrown up as utterly ruined by the presence of an excess of soluble salts, and that this land will be permanently injured.
- (4) The increase of ill-health in the population from their living amongst undrained paddy swamps.

21. Regarding the fact, universally testified to, that two or three years of paddy growing on the clay soil suffice to render it "Psoudu," I was informed by the ryots that it was due to the fact that the water supplied was taken from the Kundair river, and this idea was supported apparently by a statement that in the first year that water came it was brought from the Tungabhadra. From my inquiries, however, I do not think the idea can be supported. As far as I could discover, on lands irrigated directly from the Kundair, where the soil was favorable for irrigation as being more of a loamy or sandy nature, no complaints of the presence of a superabundance of these deleterious salts are known, and these lands have often been under cultivation for many years. This, I think, although the time at my disposal did not allow of my visiting the Kundair myself and making local inquiries, may be safely taken to dispose of the attributed evil character of the Kundair water, especially when considered in conjunction with the natural consequences of flooding a clay soil unprovided with adequate drainage.

22. My explanation of the statement that the Tungabhadra river water was harmless the first year is that in the first year the evils of flooding the land do not make themselves felt.

23. Regarding the actual cause of the annually increasing amount of deleterious salts, it is not necessary for me to explain fully, what is a well-known fact in scientific agriculture, that on undrained land the soluble salts in the soil are continually being drawn to the surface. That the soil in the locality under reference is destitute of proper drainage in almost every way must be admitted. It has neither a porous subsoil, nor in some places even adequate surface drainage, and thus the land has but little chance of getting rid of the surplus water. It being an axiom in irrigation that "the water must be passed through the soil and not simply over it," this fact shows the unadvisability of endeavoring to force water on the ryots. The ryots themselves assured me that the surface water did not find its way off the land well, and, from what I saw in the part I visited, I believe this to be quite correct. As for passing the water through the soil no arrangements have been attempted. Unless land of this nature is well drained it can never be under continual irrigation without suffering. In the Cauvery valley, in Trichinopoly, a soil of a very similar nature is to be found, which produces continuous crops of paddy, and is constantly under irrigation without in general suffering. This is due to the thorough subsoil drainage which exists there, by which the danger of the injurious salts rising up to the surface is, as I pointed out in my report on that district, except in peculiar cases, prevented. The subsoil there is sand and the clay not very deep.

24. I have stated the probability of the health of the population being injured by the extension of paddy cultivation. On the general facts of such consequences being natural, it is not necessary for me to speak here, as in a paper published in the Annual Report for this department for the year 1877-78 I explained it fully; but I may notice that experienced officials informed me that near Chennur, where the canal water is largely used, although the soil is a loamy clay, and drainage not altogether absent, the health of the people has been decidedly worse since the canal water came than it was before. Effect of extended irrigation on the health of the people.

Colonel Mullins has, I know, asserted that fever has not been increased in this locality since the canal was opened, but I believe that this statement is open to great doubt, seeing that the reasoning on which the assertion was based was, to say the least, most peculiar. Besides causing swamps all round their villages the spread of paddy cultivation decreases the area of waste and open land around the houses, and consequently increases the amount of nuisance near them, as well as herding the cattle on a smaller area during the night. This can but have an injurious effect on the salubrity of a place.

25. Before, however, concluding my reference to this work, I may mention that near Khazipett I saw a large area of free light loamy soil, admirably adapted for irrigation, and which I believe could be irrigated from the canal if a feeder were taken off from it; in fact, I was informed that this was the case. Such land as this under irrigation would produce far more food-grain than it now does, and the danger of its being injured by flooding is very small. The objection that the people of the locality are not rice-eaters of course prevails, but the difference in the amount of yield, consequent on the use of irrigation water, would more than compensate for their having to sell their produce and purchase other grain in its place. By careful consideration of the nature of the soil only can irrigation works become profitable undertakings, and to the want of such consideration must the want of success in this canal be attributed. Did I hold land on the black clay, I should prefer to be without supplies of irrigation water to having my land drenched and ruined by it. The ryots would be better advised on such soils, unless the drainage is perfect, to pay for being allowed to abstain from using the water than for using it.

26. There is nothing in the ordinary systems of farming in the neighbourhood now referred to to be worthy of note.

27. *Jammalamadugu Taluk.*—The greater portion of this taluk is one wide-spread open plain of black clay soil—"cotton soil"—very bare of trees, only supporting a scanty growth of *Acacias* here and there, which are allowed to grow for the supply of firewood. Such trees are not planted, nor are the seeds ever sown, it being considered necessary that the goats should distribute them. The soil is very often deep, and is underlain to a large extent by limestones and slates of the Cuddapah formation.

28. North and east of the Pennar, on the black clay, the staple crops are cholum and cotton, although indigo is grown to a certain extent also. Close to the villages occasionally small patches of chillies and other vegetables are also raised, but the supply of these products in the locality is very meagre. By far the largest area is occupied by cholum, which is commonly taken for two or three years in succession, and then followed by cotton. Indigo is usually sown together with korra (*Panicum Italicum*), the latter crop being cut out before the former attains any size, and thus a double crop is obtained from the land.

29. Unfortunately whilst at Jammalamadugu I was, owing to an attack of fever, unable to see much of the neighbourhood, but in visiting a typical village I saw what, I believe, from what information I gathered, I should have only seen repeated had I been able to visit several.

30. Means of irrigation there are none, or very few, north of the river; tanks are not required, and in fact the country is so level as not to present any facilities for making them; whilst the clay soil is so retentive of moisture that but little rain suffices to carry a crop to maturity, whilst loss still would be enough if the system of tillage were less perfunctory and careless. It was from this taluk that the soils, experimented with by Mr. Schiffmayer in 1876,* were sent, and, by the results obtained by him, their powers of absorbing and retaining moisture were most clearly shown. From these results it will be seen that the percentage of organic matter in the soils is not high, ranging according to the experiments from 2.99—6.03, or, say, on an average 4 per cent. as mentioned in paragraph 28 of my Trichinopoly Tour Report, and that therefore the retentive power alluded to is due in a great measure to their mineral composition and physical texture. Irrigation is not desirable on such soil as this; it is in fact injurious.

31. The perfunctory nature of the tillage performed may be understood when it is described. In preparing the land for cholum or cotton, it is first ribbed by means of the country plough, the intervals between the furrows being about six inches. In doing this work one pair of cattle are said to be able to get over about an acre in a day. After lying for some time in this state, the whole surface soil is stirred, by means of an implement called a *Guntakah*, to a depth of not more than two inches. By this operation all the weeds and grass are cut off below the surface, and consequently die before the seed is sown.

32. The *Guntakah* is an implement which performs to a great extent the work of a grubber or scarifier in English farming, and is well adapted for certain purposes, and if not too much depended on. It may very well be used, as it is, in preparing a seed-bed, but the work it performs does not suffice for good farming, whilst in this locality it is supposed to do so; it goes no depth, and never moves more than a small quantity of the surface soil. It consists of a beam about 4 feet long, to which the draught pole is attached as in the native drill, and to this beam, in such a position that it will be forced under the soil when the implement is drawn over the land, and about 6 inches from it, a cross piece of iron is fixed parallel to it. This piece of iron is a square bar hammered out so as to form a knife-edge, which in passing through the soil, being worn on both sides, does not get thoroughly blunted. The bar is about 3 feet long and is turned up at the ends so as to enable it to be fixed in the wooden holders, which are let into the beam already mentioned. The implement is in fact a large scraper, or may be compared to a huge Dutch or push-hoe with the handle (draught pole) fixed at an angle of 45° to the hoe instead of 160° or thereabouts.

33. It can thus be easily understood that the tillage usually performed is very little. A ploughing, which does not stir one-sixth of the surface soil to a depth of more than 2 or 3 inches, followed by a couple of scrapings of the surface, is all the preparation the ryot of this neighbourhood usually makes for sowing his crops. In seasons of abundant rain this suffices, and the natural fertility of the land gives him crops which his labor has done but little to encourage. In seasons when the rain fails, the crops fail, and he finds himself face to face with starvation; whereas in seasons of all but total absence of rain, he should be able to raise fair crops on the soil he cultivates did he treat it well.

34. Although the usual system of tillage is poor, the ryots are aware of the value of deep cultivation, as is shown by the use of a large plough yoked to several pairs of cattle; but the chief value of the work done by this implement is set on the effect it has in the destruction of Hariali grass (*Cynodon dactylon*). The effects of the use of this implement are said to be observable for ten years, but the

* See page 19 et seq. of the Saidapet Farm Report for 1875-76.

area annually operated on is very small; and the use of this description of implement is not at all universal. The crop usually taken immediately after the deep tillage is Bengal gram (*Cicer arietinum*). Did this practice prevail over the greater part of the black soil area, and were it regularly performed, there would be little danger of the locality suffering from a failure of crops, which, when it occurs, is most severely felt here, owing to the absence of roads for the transport of food-grain into the district.

35. The cholam crop, which is the staple of this locality, is in a few cases manured, but only on the lands close to the villages, and as the available supplies of manure are small, owing to the use of cowdung for fuel, it is but a small area

System of growing Cholam.

which gets any even of the sun-dried poor stuff which comprises almost the sole manure supply of the ryots. The seed is sown with the drill and the work is done in a most workmanlike manner. The weak point of the country drill—there being no control over the seed supply—is fully admitted by the ryots, but they say that, as the owner always feeds the machine himself, the requisite amount of care—which must be very great—is always bestowed on this matter, and the sowing is done evenly. If left to hired labor, as the ryots say, the results would be disastrous, for even if all the seed was put into the ground, which is doubtful, it would be sown so irregularly that the crop would be patchy and poor. During the growth of the crop it is weeded, and the soil is heaped up around the plants.

36. In cotton culture, the preparation of the soil is not marked by any peculiar practices. The sowing is done in August and September, and about six months

Growth of and produce from Cotton crop.

afterwards the first picking is obtained. Usually about eight pickings are made, and the total yield of uncleaned cotton is said to be about eight maunds, yielding about two maunds (50 lbs.) at the outside of lint. According to the cotton statistics, the official average outturn for the year 1878 was 41 lbs. per acre. The lint is separated by a simple roller gin, which, though slow working, is sufficiently effective, seeing that during the cotton harvest season there is little or no work going on in the fields and the labor is found in the ryot's own family. The picking of the cotton is paid for, when hired labor is employed, by a share of the produce. The shallow nature of the cultivation adopted for this crop must always be a bar to the introduction of finer varieties of the plant, which have been accustomed to better treatment, and in the same way if the indigenous variety be treated better it simply produces leaves. The improvement of the cotton produced in this country can only come about after the general system of agriculture is raised to a higher standard.

37. On the west and south of the Pennar and Chitravati, a considerable tract of country lying alongside the Railway in this taluk is covered with soils of a loamy character; in some places filled with salt. In these lands a very large number of wells have been sunk, many of them watering very large areas, the water supply being extremely good. The chief crop cultivated under these wells is cholam, ragi also being grown to a considerable extent. On the unirrigated lands the chief crop is korra, but in no case does the system prevailing vary sufficiently from those practised generally in the country to call for special remarks.

38. *The Taluks of Ráyachóti and Madhanapalle, and Palmanair in North Arcot.*—I propose referring to these taluqs together as they all form part of the same tract of country, elevated from 1,500—3,000 feet above the sea, and possess soils of a very similar nature, and the farming pursued on them is almost the same throughout. A reference to the statement of my route will show that I passed through the taluks from nearly N. E. to S. W. As I travelled almost the whole way by night I did not see so much of the country as I might otherwise have done, but I was able to gain a fair idea of its nature during my halts.

39. In the Cuddapah District, this table-land gradually rises towards the west, until joining the Mysore country. It is however much broken up by small

Description of locality.

rocky hills into numerous small valleys, in the bottoms of which lie patches of rich oil consisting of the washings of the hills and slopes around. Where the country is more open, as it is around Ráyachóti, the soil is of very poor quality, being chiefly sandy loam, easy to work, but requiring considerable supplies of manure, and a fairly abundant and evenly distributed rainfall for the cultivation of it to be successful.

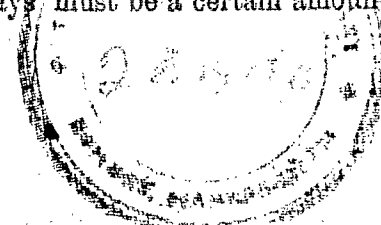
40. Owing to the hilly nature of the country, great opportunities exist for forming tanks to retain the water which naturally runs rapidly off it after rain. Great number of tanks in the valleys.

Many of these tanks are extremely small, and in many cases, as they are constructed in chains down the different valleys, the breaching of the top one, which not infrequently occurs in times of heavy falls of rain, is almost sure to be followed by that of all the lower ones, so that a train of ruin travels down the valleys, which otherwise would have produced abundant crops of food for the people. Many of the tanks are private property, and few, comparatively speaking, are purely that of the State.

41. Looking at the nature of the country, and the soils prevalent over the greater part of it, it must be always advisable to do everything that is possible for the upkeep of these tanks, for the irregularities of the rainfall in this country can only at present be met in such a locality by means of tanks and wells. These tanks however require constant inspection from persons individually interested in their upkeep. The repairs they need are such as do not usually require skilled superintendence, and are understood by the people themselves. These facts point to the advisability of leaving the responsibility for their repair in the hands of the local Revenue authorities, and of giving these officials power for the inspection of private tanks the breaching of which would endanger others, which are more or less public property.

42. The smallness of the greater number of these tanks renders it a frequent occurrence, however, that the water in them does not suffice to mature a single crop of paddy; in fact, some tanks which I saw I was informed required replenishing two or three times during the year for this purpose. Seeing that the people as yet have no idea of raising any other crop than paddy on the irrigated land, any means which will eke out the tank supplies, which are now more commonly deficient than otherwise, should be adopted. One such means is the sinking of wells in the irrigated lands. As these lands all lie in the chief lines of natural drainage, such wells would intercept much of the subsoil water which now drains away and is lost to the higher lying lands where it is so much wanted, and runs away to the low country where it is far from being fully utilized, nor is it so much required. From the nature of the country and the distance it is from the Railway, it is very liable to suffer disastrously from the effects of drought as was clearly seen in the late famine.

43. It is, however, often asserted that wells sunk in irrigated lands below tanks must always draw their supplies from the tank. Did they however draw very large supplies from the tanks above them, these wells would overflow when the tanks were full, and the water in them is standing at a much higher level than that of the land where the wells are situated. As they do not overflow, and they could only do that in cases when the land in which they are sunk was so saturated with soakage water as not to require irrigation, they can scarcely be said to draw more water from the tanks above them than that which naturally soaks slowly away by subsoil drainage. Again, if these wells were altogether dependent on the tanks being full for their supply, the idea of their draining them demands that when the tanks are empty they must be so also. This however is far from being the case. Of course there always must be a certain amount of soakage from the



tanks, and the wells below them must always intercept a great portion of this, and by this means utilise what is now altogether lost to the locality, and also in some degree make use of the water which remains in the tanks after they have been emptied down to the level of the sluices. The beds of tanks being usually covered with very fine alluvial mud, of a clayey nature, are usually very impervious, and consequently the soakage is small. It may, I think, on the whole be admitted that wells sunk in irrigated lands below tanks do not draw from their supplies in the tanks to an injurious extent, and also it is most probable that wells sunk a 100 yards from the tank bund are more likely to draw their supplies from the tank than those which are close to it.

44. Of the value of wells sunk in the situations referred to there can be no dispute. They intercept and render available the water of subsoil drainage. By their use the ryots are able to prepare their lands and sow their crop before the tank receives any supply of water, and again after the tank supply is exhausted the well water not infrequently enables his crop to mature when without a well it would be altogether lost, and the Government rent of the land for the year with it. When a ryot can get water by gravitation from a tank, he will never go to the expense of lifting it from a well, so that there can be no danger of his objecting to pay the "irrigated" rent for his land because he has a well. If wells sunk under tanks acted like "artesian" wells, they should of course be prohibited, but that this ever occurs is not, I believe, the case. As a natural sequence to the above remarks, I conclude that every encouragement should be given to ryots for sinking wells in their irrigated fields in order to render their crops and the Government revenue more certain.

45. The cultivation of the irrigated lands in this tract is not of a high order. The cropping consists chiefly of the perpetual growth of paddy year after year, alternated, in cases when the water supply is sufficient, with a second crop of ragi or cholam, or a crop of sugar-cane. The latter crop is taken, where it is possible to do so, about once in not less than three years, but in some parts its cultivation is decreasing owing to the stoppage of the local distillation of spirit from the molasses; this is particularly the case around Madhanapalle. In ordinary lands where paddy only is grown, a fair amount of manure is used, these lands in fact receiving all, or nearly all, that the ryot makes; he also obtains large quantities of leaves, particularly those of the *Pongamia glabra* of which very large quantities are collected, the trees being grown specially for the purpose of supplying these leaves. The leaves are trodden into the soil green, and thus act as a green manure to the land.

46. In the preparation of the paddy fields no particularly-marked practices exist to distinguish the system practised here from that found elsewhere in the Presidency. After reducing the soil to a state of liquid mud-puddle the leaves and manure are applied and the seed sown broadcast immediately. Seedlings are not raised and transplanted into the fields, although this practice would often save time when time is very precious, whilst it must be remembered that a crop being a fortnight earlier or later may make all the difference between a fair return and failure, or at the least a bare remuneration for the labor bestowed.

47. I found here, as I did in Trichinopoly, the superstition existing regarding the fortunate days for the sowing of this crop. On three days of the week only is it considered right to put in the seed, on the others it is not done. Another superstitious practice also prevails; it is performed shortly before harvest, and consists of the slaughter of a sheep, for which purpose several ryots club together, and taking the blood of the animal they mix it with some rice and scatter the mixture over the crop after it comes into ear. By this means they believe that the produce will be increased.

48. After the seed is sown the fields are allowed to dry until the sprouts are about 2 inches high, and from that time till harvest it is considered necessary for success to keep 2 or 3 inches of water on the land. Thus the amount of water used is far in excess of the actual requirements, but this waste is so general throughout the country that it is not a feature to mark the locality now under reference. The paddy fields, however, are usually more or less terraced and lie in valleys where the natural drainage is very effective, and at the same time the ryots like to keep the water in their fields in constant movement, and for that reason maintain, whenever they can, a regular flow from field to field. These last-named practices are very good, but if they were adopted in moderation would be much better; as at present pursued they cause great waste of valuable water, but are nevertheless better than allowing water to lie on the fields until it disappears by evaporation or soakage (unless the latter be very rapid). When the crop is about 6 inches high it is crossed with a rake, apparently in order to thin the crop, which the excessive amount of seed used generally causes to be too thick on the ground.

49. The cultivation of ragi as a second crop on irrigated lands is of course limited to those areas which possess a good water-supply, and generally the water for this crop is obtained from wells by baling. The crop is transplanted from seed-beds, the land being ploughed up when moistened by the rain and then manured to the extent of the manure available, ten cart-loads being considered a fair dressing, but the amount used varies of course with the amount of stock possessed by the ryots. The depth of tilled soil does not, I think, exceed about three inches. After the manure has been applied, it is not infrequently left for a few days before the water is let in, which is done immediately before planting out the seedlings. During the growth of the crop, it is said to require watering about once in 7—10 days, and to be weeded once. The last is a most expensive operation, as it is done either by hand-pulling or with a small iron crook, which has a blade about one inch wide. Sometimes, however, the ragi is sown directly in the irrigated fields, and then the seed is always broadcasted. With the same crop on irrigated lands it is usually drilled in, but the only reason which is given by the ryots for not adopting the latter practice on the irrigated lands is that such is the custom of the country. Not being customary to drill the seed, it is never tried. With custom so strong it must truly be the work of long duration to effect any changes in the practices of these cultivators.

50. Besides ragi, cholam is grown as a second crop on the irrigated lands in this locality, but its culture is not marked by any characteristic practices.

Wheat is also grown to a small extent, and with it the ryots have to adopt better treatment than with either of the former crops. The land is crossed and recrossed with the native plough very often, and the land is well manured, both by folding sheep on it, and by the application of the usual cattle manure. The wheat grown is spelt wheat. It is watered about twice a-month, being grown during the season when rain is expected. The crop is not taken in perpetual succession, but is only alternated with paddy, and is only grown on the better soils.

51. Sugarcane, which is also grown on the irrigated lands, occupies the land about a year. In the preparation of the soil for it, considerable care is exercised, and large quantities of manure are applied. The manures used are cattle and sheep manure, the flowers and the refuse oil-cake of the *Pongamia glabra*, and fresh cattle dung. The land is ridged and the cuttings planted, laid flat in lines about 18 inches apart, four or five joints being allowed to each cutting. During the growth of the crop it is watered between every second row, so that a high ridge

and a water furrow are formed. Water is applied about once in four or five days. To prevent the attacks of the jackals several stems in each plant are tied up together with leaves of the cane.

52. On the unirrigated lands of this tract, the staple crops are cumboo and ragi, the former being more generally grown in the Cuddapah District, and the latter being almost solely grown in the Palmanair Taluk. The cumboo crop, when I passed through the country, was looking poor and very patchy, owing to want of rain. These crops are seldom sown alone, the cumboo being usually mixed with a number of pulses, a mixture of nine sorts of seeds being frequently sown. The following is a mixture which I found being sown in some places, and is called *Navadaniam* :—

Cumboo (*Penzillaria Spicata*).
Horse-gram (*Dolichos Uniflorus*).
Green-gram (*Phaseolus Mungo*).
Bengal-gram (*Cicer Arietinum*).
Dholl (*Cajanus Indicus*).

Mochaicottai (*Lablab vulgaris*).
Caramani (*Dolichos Simensis*).
Gingelly (*Sesamum Orientale*).
Roselle (*Hibiscus Subdariffa*).

The ragi crop is usually sown mixed with Mochaicottai, this pulse being put in in lines, without reference to the ragi crop, being dropped in a furrow made with the native plough. Occasionally a crop of castor is taken on these lands, but the area under the crop is not large. In a few places I saw cotton bushes amongst the cumboo crop. Gingelly is also grown to a small extent.

53. The system of cultivation on these lands is not remarkable for any characteristic differences from that pursued generally in Southern India. Manure is only applied to the lands when a demand for it exists from irrigated or

Manure used.

garden lands, and then only in small quantities, ten cart-loads being considered a fair dressing. The practice of sowing a mixture of crops is a good one; for it both in a measure serves the purpose of an alternation of crops, in that the plants grown being of different orders make different demands on the soil, and also the variety of crop in some degree makes the ryot less liable to suffer from total loss of return from his lands. At the same time as the pulses, &c., ripen at a

Advantages of the mixture of crops.

different time from the main cereal crop, the work of harvest is extended over a longer season, and thereby useful employment for the ryot and his family is increased.

54. The cereal crops are sown variously by drill and by hand. The former process being adopted when the land is sufficiently dry for the purpose; the latter when it is more or less soaked by heavy rain to such a degree as to render the

Methods of sowing the seed.

working of a drill a matter of difficulty, even if it did not injure the land in its passage. Drilling is of course the preferable process, but one of its great advantages, the decreased cost of weeding drilled crops, has not yet been discovered in this locality, for the ryots say that the cost of weeding is the same whether the crop be drilled or broadcasted. This is the natural result of their method of weeding as described above. With proper tools the reduction of expense

Expense of ryot's method of weeding.

in weeding a drilled crop is very great, whilst at the same time the benefits of interculture are brought into play. The amount of seed sown for the ragi crop is admitted by the ryots to be too great, but they have not the means of controlling the supply properly in their drills, and consequently have to harrow across their crops when a few inches high, in order to remove part of the surplus plants. The great power which the ragi plant has of tillering, marks it as a crop requiring a very small amount of seed to be sown.

Waste of seed in drilling.

55. I may remark here on the small differences of practice between the system of farming in the Trichinopoly District and in the one now under reference. Excepting that in the former the use of the drill is unknown, they are exceeding

minute, the slight modifications pursued on the black clay lands being alone well marked, the better farming around the town of Cuddapah not being at all typical of the district as a whole.

56. It will be seen that I did not visit the taluks of Pullampét, Sidhout, Budwel, Proddatur, Pulivendala, or Kadir, whilst I only passed through a corner of the Vayalpad Taluk, the time at my disposal, a month, not allowing me to do more. In the following paragraphs I shall make a few general remarks on features common to the whole district.

57. *Live Stock*.—In the two great divisions of the district, the cattle in common use differ greatly. Around Cuddapah and on the cotton plains the cattle are almost all of the Nellore breed, tall, bulky, clumsy, flat-sided animals, which however possess great strength, and when

Description of cattle found in the district.

cared for are useful beasts. They are imported from the breeding districts in Nellore, being brought over annually by drovers who seldom obtain full payment at the time of sale, the purchase money being spread over several years. The cattle are brought over when just ready for use and are said to last about eight years. Above the ghats the prevailing description of cattle is the small breed common to the South of India, intermixed with a considerable proportion of those of the Mysore breed, so that the cattle-power is of a high average quality.

The Punganur breed of milch cattle is said to be rapidly deteriorating, even if it is not quite extinct in a pure form.

Punganur cattle deteriorating.

Whether this breed deservedly possesses a reputation for milch producing powers is a point which I am very desirous to determine, and shall make endeavours to do so as soon as possible by obtaining some cows from the native locality of the breed.

58. The injurious effects of the use of any bull as a sire are well known, and why, in order to prevent this in some measure, compulsory castration of all but well-developed animals might not be resorted to, it is difficult to see. The proceeding would not be a hardship to the people, whilst, as a general benefit to the country, it would be a very great advantage.

59. The sheep of the district are not remarkable for any excellence. I saw a few fairly woolled sheep near Madhanapalle, but I did not come across many sheep in the course of my tour.

In folding the sheep on the land hurdles are not used in this district, the flock being simply herded on a particular part of a field during the night.

No fixed lambing season is known, owing to the universal practice of letting the rams and ewes run together; but the shepherds acknowledge that the best season for the lambs being dropped is February.

60. *Implements*.—The native plough, or scarifier as it should more properly be called, used in the district does not differ essentially from the usual pattern. Three different sizes of it are in use—the smallest for the cultivation of irrigated lands when being prepared for the paddy crop, a rather larger one for the ordinary tillage of the unirrigated lands, and a larger and heavier description for occasional use on the black clay soils as has been mentioned above. It takes about four days of seven hours each to cultivate an acre once with this implement.

Ploughs in common use.

61. Next in point of importance is the ordinary bamboo drill, consisting of a small wooden hopper, perforated with holes which communicate with bamboo tube below, into which the seed is fed by the hand. The seed, passing down through the bamboo tubes which radiate from the hopper, is deposited in the soil by

Description of the bamboo drill.

a series of similar perpendicular tubes which are fixed in a beam of wood which receives the lower ends of the bamboos which communicate with the hopper. The beam mentioned, the draught poles, which are two converging to the point where the yoke is attached, are fixed, as well as a single stilt which is used for directing the implement. The whole machine is very simple, and costs from 7 to 10 rupees. The perpendicular tubes below the cross beam are sometimes fitted

with iron coulters, and the implement is then also used as a rake or rude harrow.

Work done with drill. With this machine from two to five acres can be sown daily, the area being, of course, dependent on the speed at which the cattle travel and the breadth of the implement. Usually the number of lines sown is five, that being as many as the arrangement of bamboo tubes will allow of; these lines are usually about nine inches to a foot apart; but the distance between them varies in different localities, and for each arrangement a separate machine is required as it is not adjustable.

62. It is striking to remember that drilling in seed has been practised, for how long we cannot tell, in this country, whilst the invention of the drill in England can only be dated back about 150 years to Jethro Tull, "the father of modern agriculture." But simple and low priced as it is, the native machine possesses several points which greatly decrease its value. As I have already noticed, control over the supply of seed there is none, and consequently in the case of small grains there

Defects of the machine. is a great waste of seed, and there would be more did not the owner always attend to the feeding of the machine himself. To overcome the excessive thickness of the crops sown by this machine the ryot is obliged to tear up a considerable portion of them by means of a large rake which he uses for the purpose. Again there is no means of regulating the depth at which the seed is deposited in the ground, and consequently the germination of it and the growth of the crops afterwards is injuriously influenced. Its inadjustability is another drawback to its value.

63. The saving of a small quantity of seed per acre annually would realize a good interest on the capital necessary for the construction of a machine of slightly greater prime cost, but of far greater efficiency. That no steps have been made to improve this machine by the native cultivators during many centuries may well be contrasted with the progress made in the same matter in Europe. It however shows that either the native ryot originally copied the machine from some one else, or that in former days his inventive faculty was more highly developed than it is now.

64. Of other implements I may mention, the guntaka or scraper to which I have already alluded, and several descriptions of rakes, built of wood, and of wood and iron together, used for the purpose of cleaning the land, and pulverising the soil, and also for the cross culture necessary in the raggy crop to remove the superabundance of plants.

65. The only tools in constant use are the mammotti, crowbar, sickle, and a small hoe about one inch wide, with which, squatting on his heels, the cooly digs up the weeds amongst his crops. The mammotti is short-handled and large in the blade.

66. *Water-lifts.*—The only water-lift in use amongst the ryots is the single mhote—*Kapella* or inclined plane-lift. The evil effects on the cattle of this method of raising water, when they have to back up a steep slope, have been frequently pointed out, but in the district under report where wells are at all deep (over 20 feet lift) it is general to employ two

Arrangement of two pairs of cattle for single mhote. pairs of cattle at each; one quietly walking back up the slope, whilst the other is engaged in raising the bucket full of water; a man unhitching the lifting rope from the yoke of the cattle as soon as the bucket is empty and running back up the slope with it attaches it to the yoke of the second pair of cattle which are by that time ready for him to do so. By this arrangement the work goes on more quickly

Waste of cattle-power. and the cattle are saved from great strain, and were it not for the loss of cattle-power which the system involves would not merit any alterations. As it is at present, the supply of cattle available is far greater than the demand for baling from the wells, and so, although the double mhote is a more economical water-raising arrangement, the ryot has at present no peculiar inducements for him to invest the necessary capital, even if he has it, in a machine, the adoption of which would cause his cattle to be idle for two-thirds of their time.

The picotta is not used in this district.

67. *The Ryot.*—In this district the cultivators are, as a rule, altogether illiterate, despising and rejecting all education for their sons, as being likely to unsettle them and lead them in turn to despise the vocation of their forefathers. They ask "Of what use is writing, if our sons cannot plough and work on our fields properly?" This objection is one which has been met with amongst the rural populations of nearly all countries. At the same time the adherence to custom, which is so strongly developed in this

Force of custom. country is, I think, more powerful in this district than in the south. The obstruction, which this feature has presented to agricultural progress in all countries, is well known, and it might almost be said that the persons in the old story,* which is often quoted to exemplify this in England, could have been a Government official advocating the use of a European plough, and a ryot of this country replying to him. But no doubt to a certain extent, "It is," as Wren Hoskyns says, "a mistake to attribute these things to obstinacy, or any unwillingness to adopt an improvement that *can be perceived*: it is in the perceptive faculty that the impediment lies—a faculty which will not act of

Reasons why farmers adhere to old customs. itself, without exercise," and one which the circumstances of the life of the ryot do nothing to develope, but much to deaden. Causes and effects follow so slowly in agriculture, that the difficulty of following out the teaching of experiments is very great. If we add to these agencies the extreme poverty, the manifold superstitions and other influences affecting the

Peculiar reasons in case of the ryot. ryot, it is difficult to reasonably expect that in the longest life of effort for agricultural improvement much can be effected in the modification of his present practices, unless pressure is brought to bear on the cultivators by their landlord—the State.

68. The amount of capital which the ryot possesses is generally extremely small; and were he willing, he would not be able to make many experiments with changes of his system, which he has at least found to bring him means of subsistence in ordinary seasons. If by any means new men—men not born and bred in it—can be induced to embark in agriculture, and to bring to it such a reserve of capital as will enable them to attempt things, which the ordinary ryot cannot from his circumstances adventure on, then can more rapid progress be expected, for such men "often form the most intelligent of husbandmen." As an old writer on English agriculture observes: "They have more zeal and fewer prejudices to surmount, than those who have been brought up in it from their infancy. Their closer attention and freedom from the influence of habit make amends for their first ignorance of minutiae; and being driven to the pains of really *studying* their pursuit, they form their ideas upon its guiding principles." Such a man is Mechi, who has achieved such success at Tiptree in Essex.

69. Thus it is, I believe, almost hopeless to attempt to influence the present Little to be hoped for from present race of ryots, or even their children, as long as they resist their being educated even to the slightest degree. Model farms as examples to the ryots, and the operations conducted by Government agency, whatever they may be, will be, and are, I believe, looked upon by the ryots in much the same way as the proper arrangement of his horses was by the poor man in the story referred to above. The diffusion of agricultural information amongst the educated ryots through the schools, and by means of employing in the subordinate revenue posts only such men as are acquainted with the true principles of agriculture, will do much. But if any marked improvement is to be effected, it must be from the infusion of new blood into the cultivating classes, and how New blood required if farming is to advance.

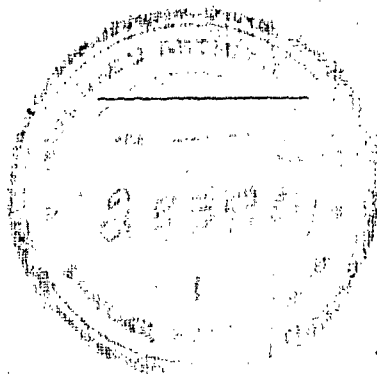
* This well-known story is that a certain nobleman, who, seeing a man ploughing a light soil with four horses in a line, got off his horse, unhooked the two leaders, harnessed the two others abreast, and ploughed a few furrows out with his own hands, intending to show how easily it might be done by a pair. "Ah! it's all very well for you that can afford it," said the man; "but these new fangled improvements are too expensive for a poor man."

this is to be done it is difficult at present to see ; unless it be that those men, who, after obtaining a State education in schools of a high character, are disappointed in obtaining Government employment, at present almost their sole ambition, will turn to agriculture as giving them an opening for an honorable profession, which will afford them a fair prospect for the future. But amongst these men the want of capital is very great, and without that no great steps towards improvement can be made.

70. The problem then reduces itself to the attraction of a greater amount of capital to the land and to the inducement of natives of the higher classes to embark directly in a pursuit which has until now been looked upon as the proper employment for serfs. To induce attention to the honorable position which an agriculturist occupies, to foster an interest in his pursuits, to offer persons, who have had their attention turned to husbandry, an opportunity of acquiring the best possible knowledge of the science and practice of that art, and attempts to induce such attention, together with endeavours to scatter agricultural information broadcast throughout the country, are all objects which will bring Government a return, but from which it is hopeless to expect immediate results; and, considering the position the active occupation of a farmer occupies at present in the estimation of the native community, can only be hoped to bring forth results if most carefully fostered and watched over by the State.

71. It should not be concluded, because I say that progress must be slow, that endeavours must be slackened; on the contrary that very fact should cause them to be redoubled; and, although for a time much will have to be left to faith as far as regards results, if the work be carried on a well-devised system, which can reach to all parts of the Presidency, confidence may be firmly placed on the fact that, as the Board observed in their Proceedings, No. 5,223, dated 13th December 1877, "great progress towards results may be made."

(Signed) CHARLES BENSON, M.B.A.C.,
Acting Supt., Govt. Farms.



Checked
22/10/77

3-7-81
5/10/83

R
J. 2113 052 1611 1077
1077