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## THE RURAL PROBLEM

During recent years the organisation of the village has attracted much attention from public-spirited men, and during the last two or three years this subject has come to attract greater attention by means of conferences and some propaganda work on the part of those who have come to help the work.

This idea of organising the villages was first given out by the late Mr. C. R. Das of Bengal. After getting into grips with politics, the great leader saw that real India was in the Villages and not in the Cities or groups of literate men. When he thought deeply he found that if the country was any time to come up the villages must be paid greater attention to. He had his scheme but before it could be launched he unfortunately passed away.

Later on, some others picked up the idea of village reconstruction but their point of view differed much from the point of view of the great leader and in all further efforts in this line the real problem which is the *economic condition* has been ignored.

Before proceeding to deal with the popular attempts it would not be out of place to deal with official efforts for the improvement of the village. The Government could naturally know the condition of the people better than any others, and about the beginning of the twentieth century they started two departments, primarily combined in one, namely, the Agricultural and Co-operative Departments. Simultaneously, an Agricultural College was started to help the agriculturist by way of research and propaganda. It would be out of place to deal with

the nature of research or propaganda of the Agricultural section of the Department. It would be enough to state that the research was not as usefully planned as it should have been. Those who ~~guided~~ the researches or selected the problems for research were men without local knowledge and consequently researches in the beginning were mainly restricted to academic information. Recently, we find, since the inception of the Central Cotton Committee and the David Sassoon Trust Fund, that some research work really useful to the cultivator is being done. The researches of the Indian Central Cotton Committee are unfortunately based on a commercial basis and naturally enough the national point of view comes next. During the last few years, the Imperial Council of Agriculture has undertaken some schemes really useful to the country and thus the Government attempts have begun to come much nearer to popular demands. Recently, the Thomas Committee appointed by the Government of Bombay to suggest re-organisation has recommended the establishment of a Rural Development Department combining the three existing departments namely Agriculture, Co-operative and Veterinary. The suggestion is really laudable and if worked by public men, scientific specialists, assisted by the right type of earnest—not mercenary—propagandists would bring forth very valuable results. These nation building departments should really be worked and controlled by the people in the interests of the people. The Government should finance this body which it should do liberally.

It would be interesting to trace the history of popular attempts that have been made during the last ten or twelve years. With the advent of the Montague-Chelmsford Reforms the franchise was increased and many men could vote in the elections for the provincial and central legislatures. Many voters reside in villages. The candidate had to go perforce to the village and seek the vote of this cultiva-

tor in order that he may get to the Council and be part of the prevalent political power. This naturally made him conversant with at least some surface problems in the village. Whenever he went to the villager for a vote the village problems were forced on the attention of this urban politician who was bidding for political power, since all human beings are anxious to befriend those that give them political power. And as this fact was brought home to the candidate he began to invent methods by which he could command this vote. We read in the history of the middle ages about the efforts to get gold as gold was then recognised as the means to gain power. They spent any amount in the search for the philosopher's stone that had the power to transmute iron into gold. Equally zealous or more so are many of these political power seekers. They are literally mad for the vote. They are capable of doing anything for the vote that they want to gain. If one only considers what an election means one will certainly be convinced that if any of such workers were to undertake rural uplift work one will surely not only suspect but will be convinced that all these attempts are to seek political power. There will at least be no reason why it may not be construed like that.

Amongst the attempts that have been made up to now one will clearly see that none of them have been based on purely economic lines. Since 1920 onwards, the most that has been done in this line is the starting of schools.

**Education** This is an item which has really no place as a means to help the villager. This statement is certainly against the general feeling of the so-called workers and may be a rude shock to those seekers of votes who are in season and out of season stressing literacy. A short description of the literacy that is at present imparted in the villages and the nature and effect of the education that is given would be enlightening.

Visit any small village school and you will find it worked either by one teacher or at the most two teachers. This teacher is very meagrely paid and has usually to maintain a family of three to four. He has naturally to live at the mercy of the villagers and the Local Board authorities. His office work is quite enough and more and leaves him very little time to look to his heterogeneous mass of students for tuition. Usually the classes are up to 4th standard and beyond that very few people can study as they have no means to study at the Taluka place. Here the whole training ends. This does not help them in any way not even to read a letter, a few years after they have left school. This is a general story of any of the small village schools. Further one can argue that literacy is no remedy for solving the village problems that actually harass the cultivator. The vote-seeker has forced this on him at his (voter's) expense. The Local Boards and Provincial Governments—elected persons—are very keen over primary education. This helps them to seek the vote.

The next item that was selected was drink. This particular habit has no doubt been bad and has done great disservice to those who are addicted to it. If one were only to imagine the condition which forces them to this, one would certainly pity the lot and not condemn them as usual. In this connection, even popular Ministers have failed and have given a variety of irrelevant causes as to why they have failed to bring this about and as to why no advance could be made in this line.

The first and the second points, namely, education and drink have been closely inter-related so far as the finance in the Bombay Presidency is concerned and both have failed like an obstacle race. Moreover, there is no specific good in this programme except reiterating that literacy is good and drink is bad. The fundamental question is whether this drink

or that education can in any way help to feed the half-starved villager. The plain answer to this is no.

There is a third set of workers who concentrate on village Panchayats. These attempts may bring in some good if some powers are delegated to the Panchayats by Panchayat Government. But looking to the act recently passed by the Bombay Council the tendency seems more to cripple than to help.

The social workers also tried to come in and spread child welfare work and also sanitation, health and hygiene. One wonders how far these attempts could be Social Workers successful. The very fact that they are costly would deter the villagers from taking to them whatever their utility.

Most of these workers being urban and without direct knowledge of the village cannot possibly conceive the problems of the village. The primary idea with which these well-wishers—seekers after political power—go to the village is that the villager is a fool and that they are wise. They are the saviours of the villagers. With this patronising attitude this urban man goes to the villages and begins teaching his urban fads. Naturally the teaching falls on deaf ears.

In a village we usually find most of the cultivators in debt owing in tillage appliances, shattered in body, robbed by the middleman, harassed by the Sawkar and the co-operative society, overawed by the officials and usually insufficient in means to feed himself and his dependants. This is the usual state of a common cultivator in a normal village. None of the above attempts come up to the real problem. The real problem in

rural areas that is first and last is, therefore, neither of education nor of prohibition nor of sanitation but it is the *economic problem*. Go to any villager, he has something to tell about one thing wanting, another thing insufficient, another complains of higher taxation or a fourth of some pilfering. The whole problem hinges about the economic condition of the cultivator or producer. In India, the cultivator is perhaps the only producer there being very few other industries that supply the daily wants of human beings. Considering the labour that cultivator has to put in all the year round and the wealth amassed by him one only finds disheartening results. This class is the poorest while the other classes who only manipulate the produce by their brain are the richest. It is the non-producers who have the political power. It is this class that is most educated. It is this class that has in possession the means to hold this cultivator class in bondage. In olden days this class held sway as priests, in later days as the intelligent class and in modern days as exploiters. Thus the real producer is left a beggar to toil all the year round on his farm without the consolation of saving even a farthing. He sees millions saved and millions wasted here as well as outside chiefly produced by him. Thus the problem in the village reduces itself to a barely economic one and nothing else.

For ages past, this cultivator is tilling the land and the produce has been taken away by the intelligent man under one pretext or the other leaving just enough to feed him in olden days and a little less than what he needs during the recent days, thus leaving no scope to save anything. He has been robbed of every little thing that he possessed. Naturally enough, he could not increase his efficiency for want of means unknowingly robbed from him. He could not feed himself nor could he clothe himself sufficiently. The thirst of the higher classes for power remained all along unquenched.

On the other hand, the endurance of the producer was being taxed and taxed—which ultimately resulted in faithlessness—from the point of view of the non-producer—on the part of the producer. We find as a result of this the higher rate of interest up to 36 per cent and, in addition, the execution of a bond for twice the amount received in cash. Some of the more thirsty non-producers taking advantage of these circumstances tried to increase their holdings by litigation, thus depriving the cultivator of the ownership of the land. This resulted in imperfect cultivation of the land and subsequently smaller returns. The productive capacity of the land was thus reduced.

Other factors also were not stationary. They also were working against the producer in their own way. The raw material (cotton, groundnut, myrabolans, hides, bones, cakes, linseed, food grains such as wheat, rice etc.) from the country were immensely exported and the finished products imported. This deprived the country of the mineral matter which is the real wealth of any country, Gold can not be the real wealth of a country as it is only a measure of wealth. The real wealth of a country would depend upon its capacity to feed and clothe the population of the land and the surplus that would remain on hand. Many men are aggressive as they lack in real wealth which is food and clothing. It is these unproductive countries or people that have either to buy, borrow or steal from others the necessary food and clothing. Consequently, these aggressors are capable of doing anything for food and clothing. They have naturally to be stopped from intruding and here begins the question of defence. India by coming in contact with a coal and iron producing country suffered a great deal in the exports of raw materials. These western nations take away from India not only gold, the measure of wealth, but also real wealth in the form of bone, food materials, timber and such other raw materials which carry with them the mineral

matter from the soil without the remotest chance of its being returned to the place from whence it has been removed. This drain no country can sustain for long and it is sure to be impoverished. The question of cattle has become very serious since the War. Khandesh, which has been for long a breeding place for cattle, now rarely puts forth any good sample of an animal. Since 1915 there was a very large proportion of the total area under cotton as it was then exported in large quantities and fetched a very high price or larger quantity of gold. Fodder and grain were grown less and less. There was deficiency of fodder, and as a natural consequence due to shortage of food, there was great loss in cattle population. After some years the land also did not produce cotton as it received no manure. After continuous cropping the wilt persisted and the cultivator lost all money he had and also his cattle. Money he lost as he had to purchase grain and fodder which naturally cost him more of gold than before and thus at the end of the war boom the cultivator lost his cattle, money and fertility of the land. He himself became weaker as he contracted such habits as tea etc. Similar was the case in the groundnut area. Export and export alone was the watchword and at the end of the boom the cultivator found himself poorer in body, devoid of cattle, located in an unfertile land. This is the situation in which the cultivator or the villager of to-day finds himself. These are some of the causes that have reduced him to this condition. The problem in the villages is, therefore, purely economic and neither social nor political. The poor cultivator never imagines any political power as by conviction he thinks that those in possession of political power are representatives of God and God he believes to be beyond his scope to reach. Political power is thus not even his remotest ideal. Social status he has none; he receives no honour in society. Education he thinks to be an asset which deprives him of his productive power. This again is another complaint against the half-hazard social and political



workers. What they advocate is that this class should be well represented in the services and thus by this bait remove those who could really work on the farm and improve agriculture by their intelligence. In this way they help destruction by removing the most intelligent of this class and make them unfit for the occupation they belonged to. Their education is taken with a desire for service which is attractive because of its adjuncts—power and honour—and not remuneration. This occupation of cultivators is thus hampered in as many ways and by as many sources as possible.

During the time we came in contact with the westerner and the western methods of living, the village has gradually ceased to attract intelligent men. One of the primary causes is the imitation of the westerner and the recognition by the rulers with greater reverence the man appearing in western fashion. This the cultivator class cannot afford and is in many respects unfit to adopt. The intelligent man from the village could adopt it and consequently he was being respected which led him to leave his village where he wielded great influence. The village was thus deprived of the intellect. There have been other causes also that made him leave the village which will be dealt with later on. The village people could not appreciate such a man but were afraid of him and consequently shunned him. For one reason or the other he was unsuitable for the village and left it, ultimately joining the class of the exploiters and swelling the ranks of those who lived on the production of the cultivator.

This man from the village knew the ways of the cultivator and was fully aware of the drawbacks and loop-holes in the  
**The Village** management of his affairs. When he left  
**Feuds** and joined the urban ranks, naturally he  
**&** began to swell the wealth in urban areas and  
**Law Courts** helped urban people to draw on the wealth of  
 rural areas. One of the tools of these men is the law courts.

Visit any place and go into the details of any transaction you will find the honest cultivator being guided by one or the other of such people who is in the know of the village areas and knows the ins and outs of the cultivator. When any one of these men (cultivators) meet such an old friend they naturally explain to him casually the state of affairs during the past. This *benefactor* of his is a very shrewd being endowed with intelligence. He always seeks some point or the other which would develop into a point of conflict and tries to make it appear to be very dangerous to the cultivator. Thus begins the case and in two or three more visits develops into a full case. This brings the man to the court where the pleader is very essential. This pleader is searched out by this intelligent acquaintance for the cultivator and the case starts. Much of the little amount of money goes to this case and little remains for the farm operations. The middle man or his *friend* gets some money from both in one form or the other and is well off by the gratification which he receives from these. The fundamental reason why many seek the courts is the availability of the officer who is very far away from the place and who cannot come in personal contact with the situation. This person or officer can administer justice without the aid of any local information or persons. This state of affairs naturally encourages the ignorant with the help of these friends to seek the courts and they consequently impoverish themselves. This sort of litigation harasses him much and he is required to borrow for it. This borrowing is usually done from the same friend who advises him to undertake it. Naturally enough once instigated and found in a fix he is prepared to pay any price that is required for it and borrows recklessly. This results in depriving him of his land. This man once an owner is converted now into a tenant and is liable to be thrown off his land at any time and at the desire of the *owner* of the land. This is the working of the person, who once stayed in the village and who once tried to increase the wealth of the village, when he stays out of the village.

The present villages do not afford any scope for any arts and crafts as a result of the removal of all the wealth from the place. They also have to leave in train with **Migration of Intelligent Population** this intelligent class of people as those that used to patronise them left the village. All artists and craftsmen, therefore, shifted to urban places where they could get a livelihood and where they could add to their art or craft already obtained. Every type of intelligent man, therefore, is trying to leave his native rural residence for the urban one. Later on, he finds his rural home an encumbrance and, consequently, at a stage neglects it and ultimately it becomes only a mass of ruins. Numerous such buildings can be observed in any village even by a casual observer.

In the Deccan villages at least the motor traffic has affected agriculture and other industries. The oil industry has suffered to a very large extent. The effect of this **Motor Traffic** conveyance has tremendously told upon the power of the cultivator to maintain a sufficient number of animals on the small farm that he owns. Many times this number was just the minimum i. e., one pair. Even when the holdings are very small they necessarily require at least a pair of bullocks which is the minimum unit. This one pair has enough work with the cultivator of a small holding only for four to six months in the year. During the rest of the period the animals are idle or have no agricultural work. The holding also is such as cannot maintain these two animals all the year round. The cultivator has, therefore, to find out some work for the idle time of the bullocks. This work was carting both men and material from one place to another. The second occupation was of the oil crushing industry. This the cultivator did for the remaining period of the year and thus made the holding a self-supporting one. Now the traffic has practically been captured by the motor and the poor man has no traffic left for him.

Not only this, he himself requires to go to the market place and for this he now uses the bus for which he has naturally to pay in cash which varies from 4 to 8 annas per trip usually. Thus he makes about twenty trips in a year costing him from 5 to 10 rupees if he travels single. Usually on certain occasions some one accompanies him and the normal cost per year per family may come to about Rs. 10 as a general rule. This rule is applicable to all the villages in general on all trunk roads where buses are plying and where there is no market in the village. This amount normally is enough for the man to pay up his assessment. Many of the cultivators have to dispose of their produce at a very cheap rate simply because they have no cash at the time of the payment of the assessment. Similarly, they have no cash at the time of weeding. The cultivator thus spends some amount on the motor which he could spend for some useful purpose. But while making this statement no allowance for the human factor is made. If this is done, one will find that the actions of the producer are in no way out of human tendencies and therefore cannot be blamed. One usually finds townsmen spending money on cinemas and dramas which they cannot well afford to spend. If these men could do this legitimately and without being blamed then there is no reason why the other man should be blamed. It is natural that this man also may desire to go to bazaar places and do some marketing. Whatever the arguments it is a fact that the amount is spent on this head.

The introduction of machinery is another factor that is to a certain extent responsible for the state of affairs. One of the very common machinery is the grinding mill coupled with an oil Ghani. Both of them are worked on an oil engine. Practically all the villages have this flour mill and the amount spent on this account per house is at least half anna per day (for grinding their grain). This amount if cal-

**Introduction  
of Grinding &  
Oil Mills**

culated comes up to nearly ten rupees. This expenditure together with the expenditure on conveyance works up to an amount which if looked at in aggregate is really much from the point of the cultivator. Before, say, about twenty years, all this amount remained with him and served him at the proper times. But by this introduction he is spending this amount without knowing what he spends.

This work of grinding was and is in some places being done in early hours of the morning and did not take any time of the women that usually were responsible **Woman Less** for this from the working day. They could **Occupied** do that grinding work as well as the light farm operations such as weeding etc. which did not require much exertion. Woman now a days does the same light duties of the farm that she was required to do but does not grind. She has not taken upon herself another equally hard duty to compensate for what she does not do. She does not also do any other additional work to compensate for this and produce an equal amount in addition to what she earned by her non-agricultural occupation.

The question of marketing also gives an equally woeful tale. Before the advent of the motor car, the cultivator used his bullock cart or walked the distance on foot **Cart traffic** or if one bullock cart was going to the market **taken by motors** place they co-operated and five or six used the same for carting their purchases. This procedure, however, cost them nothing. The present procedure, however, costs them as shown above about Rs. 10 per family. It may be argued that he makes a saving in time. But how is it that he spends the leisure thus obtained. Does he do anything productive to compensate for the additional expenditure thus incurred. Most of the time thus saved is usually spent on idle talk and nothing remunerative is done. This man also

does not do any productive work but only spends. In these two cases machinery has taken the place of the man and the animal. These two not only do not bring in more money, but on the other hand take away some money from him. Carting of the finished produce was done by his own cart. Now especially when vegetables are taken to the market or the railway station they are usually taken by the bus and not by the cart. This costs him the freight and his own conveyance charges.

The introduction of the iron mot and the rope making machine are two more things that are responsible to some extent for displacing the profession of some more.

**Replacement** By the import of the ropes and the new introduction of locally manufactured materials by outside ones

duction of the Japanese rope making machines, the Mangs, who usually prepare ropes out of several fibre giving plants such as Sann, Agave etc., suffer very much. Their ropes do not fetch any value nor do they have the capital to produce on a very large scale and put it on the market on improved lines. The Mangs are a community entirely depending on such kind of work as rope making and other household requisites as brooms. Another fact about the introduction of new machinery is that it requires some skill. This skill is usually lacking in these men. Naturally enough this profession is taken by some other skilled individual and this man is put out of his business completely. If this very community were to use this rope making machine and get the needful skill by being trained then it would not be out of place and would not create any unbalanced conditions, but would only create over production and consequently competition and better quality. But when this work is taken up by an individual of another profession the balance is very much disturbed by the simple fact that the person goes out of his legitimate duties for this new profession with a view to earn more. This process

requires more energy and creates derth in one and superfluity in another.

Similarly, the introduction of the iron mot and plough and such other material that was locally manufactured has operated to the detriment of rural interests. It has displaced the Chambhar, the Carpenter and others who were an integral part of the village community. The profession of preparing these has not been taken up by these men who have been displaced, but others have displaced themselves and have taken up this profession. This has thus created an unbalanced condition. One who advocates the introduction of new appliances has always to look to substitution or adjustment. There has been such introduction but there has been no substitution or adjustment. The introduction of new appliances was chiefly made to find a market for outside goods. Take agricultural machinery. Look at the firms that manufacture these materials and one can easily understand the drain these implements have been on the country. The introduction of improvements is certainly essential for the welfare of any nation. But introduction without proper adjustment always works adversely. If the Indian carpenter who has been displaced by the iron plough or the iron mot were to manufacture these iron ploughs the adjustment would be the best. If the Chambhar were to manufacture iron mots then the adjustment would be the best and workable. But the introduction of the iron plough or the iron mot is not commendable if the Indian Carpenter and the Chambhar is to go begging and another man, a Volkart or even for the matter of that a Kirloskar were to take his place. If such things have to go on then there must be social readjustment or reorganisation. The whole economic balance is upset by such state of affairs. Whenever any society goes in for the introduction of improvements it suffers from it if no adjustment is made. Europe has suffered, America is suffering and any other nation that may follow this path is

bound to suffer. Before introducing innovations one has to think of adjustments which alone will justify the introduction. If one were to plough a land he must first of all think of stopping erosion by bunding on the sloping sides. If he does not do that, all the soil that is loosened is washed away very easily. If he thinks only of improvements, naturally it will drain the national wealth quickly and the introduction of such improvements will usually result in failure

( *Written in 1932.* )

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## EXTRACT FROM A PRELIMINARY REPORT ABOUT A VILLAGE.



The village consists of about 700 villagers and about 200 houses including one wadi. This wadi is about one mile and over from the village itself.

The cropping of the place is Kharip and Rabi both. The Kharip crops include Rice, Nagali, Nilva, Karala, Peas, Udit, Chilies and such other minor crops. The Rabi crops include Shalu Jawar, Gram, Wheat and some vegetables.

The village is very heavily indebted and the extent of the indebtedness may amount to about 50,000 and over. All this has been incurred chiefly for current expenditure, ceremonies and agricultural developments or necessities such as bullocks and implements. The rate of interest varies from 12 to 24 percent.

Nearly three months of the year are spent by the cultivators without work.

There are some subsidiary industries in the village two of them have been noted:

Preparation of Khawa from milk. This is a finished product of milk and is transportable. It is in solid condition and occupies less space. This industry can very well prosper here considering the large acreage under grazing which is about 60% of the total area.

Carting is another business in which the cultivators earn a total of about 3,000 rupees or so. Cutting grass from forests is another allied subsidiary industry to carting which also

gives them 3,000 to 4,000 annually. All this money goes to the Sawkars by way of interest.

Bamboos thrive well in this locality and this industry may possibly develop if the plantation is undertaken and may pay by sale of ripe bamboos or by preparing baskets out of the same.

There is possibility of development of Karanj plantation which is very useful from the point of view of Manure, Seed and Wood. The foliage is useful for manure, The seed is useful for getting oil for burning and the wood is useful as firewood. There are full possibilities for development along the Nala if this plantation is made. This may develop the oil industry for a couple of Telies.

There is an old block of an oil mill in the Wadi. This if revived would fetch some more money to those who own the mill after some time. There is quite a thriving plantation of Sagawan on the adjoining hill. This if cleaned has a sure chance of thriving.

In addition to the above mentioned three points the undersigned would like to add two more which he has observed during his general inquiries. They are the condition of cattle and manure supply.

The condition of cattle in the village is not satisfactory so far as the working season is concerned (summer). There are very few large sized cattle and those that are available are in bad health and are low set. They are not heavy enough and may weigh some where near 600 lbs. This does not give a good weight for draft. This small size is accountable so far as the feeding stuff is concerned. It is chiefly grass and the size and weight of cattle corresponds to the feeding material. The place does not grow much oil seed and all the concentrates have to be imported. Thus the feeding stuff that is locally available is not congenial to heavy size. The grazing areas, chiefly hills, too would not suit heavy sized cattle.

The people seem to be very keen over preserving whatever manure supply is available to them from their animals. The approximate number of cattle as I am informed is about 400 which would give about (2 cart loads or 1 ton per head) 800 cart loads of manure if the whole of it is preserved. If deduction for Rab and house-hold use are made the quantity may fall as low as 600 cart-loads which would be just enough for manuring 50 acres of ordinary crop. If a more exhaustive crop is taken then it should manure about 20 acres. Taking an approximate number this would be enough to manure about 40 acres. Since this lasts for about three years, the total maximum area that would give a normal crop would be 150 acres and the normal would be about 120 acres. This is just  $\frac{1}{3}$ th of the cultivated area. It will therefore be clear that the manure supply of the place is not adequate. Some more area is manured by sheep folding but the area so manured is very little and is practically negligible.

### Difficulties :—

There are some items on which the villagers suffer they are mainly three, so far as they have been noticed.

- (a) They suffer a great loss amounting to about Rs. 3000/- annually on cutting the grass etc. and carting the same to the place of destination. This is chiefly done by manipulation in the weights. This will of course have to be studied and verified.
- (b) The nearness of the forest area and consequent prosecutions amount to a difficulty in this place. This would sound rather curious. An example can be quoted where a man has lost a great deal due to this persecution by the forest officers.
- (c) The difficulty of a good road is felt by the cultivators to a great extent chiefly in the four months of the rainy season.

These are the three special difficulties in addition to the usual difficulty of marketing and storing produce or withholding the same for some time. The availability of ready cash and such other usual difficulties are felt.

Apart from the work in the village one general fact has been noted in connection with the marketing of peas which is very much serious. The usual way in which this produce is sold is by weight. A certain rate is fixed by seers to the rupee. The usual weight for four seers is  $4\frac{1}{2}$  seers or 5 seers at times. In addition to this the cultivator is cheated by tricks in weights and weighing. On an average he has to give from six to six-and-a-half seers for four seers of stipulated weight. Besides this the loss by way of distributing openly to the people on the weighing station are not ignorable. The quantity of over-ripe pods is usually picked out before weighing and this goes gratis to the purchaser. This state of affairs is much more enchanced in case of cultivators who have small quantities to sell. They are usually required to give twice as much weight. This fact was noted personally one day at the selling place. This is what the middle man gets. It will not be exaggeration to say that the cultivator gets about 6 annas in the rupee of the retail price which the consumer pays. About two annas go for transport and rest 8 annas go to the middleman. This is what it seems to a casual looker on. This subject needs greater and detailed study.

	A.
Total area	2825
Uncultivable (Gaothan )	221
Forest	698
	<hr/>
remainder	1866
Cultivated 2 crops	800
	1066

	Rs.	As.	Pics
Total asesement	1227	3	3
Inam judi	84	8	0
Income from other sources	0	7	0

Human population 521

Animal population :—	576
Horse	1
Sheep	31
Bullocks	179
Bulls	22
Breeding bull	1
Cows	126
She buffellows	78
Calves	91
Buf. Calves	50

Iron ploughs	4	
Carts	44	carry grass
Money lenders	45	
Landlords	14	do not cultivate

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### VILLAGE PANCHAYAT

During the last five years there have been only two cases.

- (1) Criminal—Instituted by the forest dept.
- (2) Civil—Instituted by the village sawkar.

Other cases were hushed up in the village. They recover fine from the defaulter and use it for village purposes. There is of course no statutory Panchayat at the place.

## DETAILS OF EXPENDITURE

Average out of pocket expenditure per acre of cropping	2-0-0
Average cost of living per head per month including clothes	5-0-0
( Curry, Bread, and 2 Saries, and 4 Khans, for women 3 Shirts, 4 dhoties for men annually )	
Average earning from cutting grass during the season by one man.	40-0-0
Average outturn from one cart if used for carting forest grass for one full season about	75-0-0
( 2½ per trip. 10 trips per month, 30 trips average. )	

The average cultivator cannot read and write. There are only a few in the Village that can read and write.

( *Information collected in 1932* )

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## AGRICULTURAL PLANNING AND RURAL RECONSTRUCTION.



Rural Reconstruction has been attracting quite a large amount of attention of all classes including Government. One is conscious that the present villages are wanting in many things and when one feels like reconstructing a village he has before him tremendous odds and he does not know how to get over them without the means that are a primary necessity. The worker wants to educate the people and wants them to become healthy ; he wishes that they should be clean ; it is his desire to eradicate all sorts of diseases from the village he wants a clean water-supply ; in fact he desires that the village ; should get everything that is available. The only difficulty that this rural worker feels is that of the means that would be required to do this. This man wants a lot of money to see that he is able to put in all the improvements enumerated above and the like.

Considering the Indian conditions and the means that are available, together with the vastness of the work, it would be deemed impossible to create money by subscriptions and donations. No amount of donations would be sufficient to satisfy the needs of the Seven Hundred Thousand Villages of India. The money therefore that will be required for this purpose will have to be created in the village itself. If the money has to be created locally the energy that is spent in transport and the like has to be saved to the village. This means adjusting the production. It is such money that may come to the help of the Rural worker. It is not the subject-matter of this paper to deal with the reduction of the cost on the items enumerated and not enumerated above, nor is it desired to express what Education itself should

be taken to mean. Granting all the above factors and taking for granted that the minimum will be spent with the maximum benefit, the fact still remains that some thing must be spent on what the Rural worker wants to introduce. The clear question therefore is whether it is possible for Agriculture to bring in these additional requirements of the village. Is it possible to direct agricultural research and propaganda in this direction? Is the present research and propaganda completely directed towards this end?

In dealing with such and similar questions one has to look to the agricultural policies that are current in the country. One fact that confronts the thinker at the outset is that the production is being increased or decreased according as the rates available in the market. Thus the market rate is the determining factor for Agricultural produce. Since the prices and consequently the extent of cropping depends upon the foreign purchaser, it is well-nigh impossible to fix one's own production. This fact was true about the ground-nut area of the Bombay Presidency. The extent of the acreage of the ground-nut area in this presidency was commensurable with the demand from Japan and Germany. When this demand fell the rates also were reduced so much so that the cost of collecting the pods in certain cases was greater than the prices realised. This resulted in abandoning the crop by the cultivators for a couple of years. The result is that the prices rise and fall. This has a bad effect on the cultivator who, under these conditions benefits only by chance. During the boom period naturally this individual gets more money and a large amount of acreage is put under this single crop. The prices for the other crops too rise due to a larger demand or taking demand as constant, due to shorter supply. This naturally means that he has to spend the money thus gained in other commodities which he is in need of. Thus during the boom period he spends more and saves little. After the boom period he loses till he learns



the new conditions. This is naturally the result of unregulated cropping.

One who is familiar with the conditions during the war boom would stand testimony to the fact that it was during the war boom that Khandesh suffered most. For years together the greatest percentage of the land was under cotton and in certain cases cotton was grown on the same piece of land for at least twelve years. Such pieces were very common on small holding. Those who had larger areas to cultivate could not as a matter of fact cut short the area under Jawar or some such fodder crop. During this time most of the cattle were very meagerly fed with the result that they reduced in numbers and working capacity. The cultivator had to pay enormous costs for other commodities of life. At times he had to pay about twelve annas for about six pounds of fodder. In 1926 when the Khandesh conditions were observed personally, during some manure experiments on cotton, it was found that the results of the boom were devastating. The needs of the cultivator had grown beyond his control. He had no source of income except his small or big farm. The rates of employment remained at the same high level. The land lost its fertility and reduced the returns. An acre of land that used to produce about 500 lbs. of cotton barely produced half the quantity. The growth of the plants was stunted. The plants were diseased. Wilt persisted from field to field. The seed that was sown also was impure and what not. As a result of a famine year the cattle population had decreased and the available quantity of Farm yard manure was reduced. Thus the fertility of the land could not be brought to the first level when cropping was regulated to the needs of the people. The cotton area also suffered tremendously due to this unregulated cropping.

A question has been raised many times that a particular crop pays. When it is said like that usually one intends to convey that it pays within certain limits. It is not right to say that a crop pays beyond specific limits. Cotton and groundnut

were crops that *paid*. Could it be honestly said that these crops paid? When one looks nationally or even for the matter of that individually one will have to say that the crops did *not pay*. The extraordinary cropping was not only not profitable but on the other hand was detrimental to the farmers and the country in general. Due to unbalanced conditions in cropping there was less production of fodder and as a result the cattle were inefficient. The land could not naturally be efficiently cultivated and manured. This resulted in ultimate break down of the cultivator class. Examples are not wanting in Khandesh of moneyed men who are now paupers. The loss of the cattle population was a permanent loss which it is very difficult to replace. One indicative fact of this circumstance could be seen in Khandesh in 1926. The Agricultural overseer wanted a good sample of Ghee about 2 lbs. in weight to be sent to the Agricultural exhibition at Poona. For this he had to go to at least a dozen expected places and had to return without the sample. Khandesh, a tract once famous for ghee, showed this sort of deficiency. One really wonders at this result of preaching for money crops and extension of the same.

Thus when recommendation has to be made one has to previously look into the pros and cons of the recommendations and convince himself that it will pay to have that introduction. If any introduction is intended to displace an existing arrangement one that introduces has to share the responsibility of substituting or adjusting the displaced thing. If the introducer is unable to undertake this and wants to leave the gap unfilled then the introduction may not only create one deficiency, but in addition cost more to make up for the deficiency. Whenever, therefore, anything is introduced as paying the capacity of it *being paying* should be determined not by the gross returns but by the net returns that it may yield after satisfying the normal needs of one for whom the introduction is meant. All research and propaganda has therefore to be so directed as to promote this end. If it could be so directed then Agriculture has immense prospects of

getting more returns from the land. One can see these potentialities in the case of the Coimbatore experiments on cane. Many such cases where research has paid could be cited. Propaganda about such researches, the limitations of which have not been studied, has also been followed, perhaps beyond the limits. With all this there seems to be no tangible increase in wealth and the villages need to be developed or reconstructed.

With all this, it seems, that if Agricultural research and propaganda is done on a national plan and basis this question could be solved to the benefit of the villages. In this plan it is essential to know the ideals of the Society and the total population that has to take advantage of the produce from the land. The interests or rights of those who want to use the produce from the land, the distribution of the produce and the proportion of the division must be fixed. If these are factors known then it would be easy to have a national plan for Agricultural produce. Once this plan is set up research and propaganda could very well be directed in this line and under such conditions needful results could be expected. One such case could be cited of a well-planned introduction. This is of the recent attempt of the Imperial Council of Agricultural research to introduce sugar factories on small as well as on large scales. Once the facts and requirements about sugar as well as, the capacities of the land are studied, it is not difficult to direct research and propaganda in that direction nor are research workers wanting to take up the work, and see it through. This is one single case. There are many such other items which have to be taken up and followed up like this. Such a programme as could be seen from this has got its potentialities and all those workers whether Rural or otherwise that desire or expect certain tangible results have to go in for national planning in every branch and direct research and propaganda in that direction only. Otherwise the energies on research many times prove to be abortive. One fact has to be borne in mind while this plan is being laid out. Certain plans are only for manipulating or putting out a

finished product. In others the major portion of the work is only manipulation. Such items have to be rejected from this big plan. Thus if any plan were to be made for implements required in the Agricultural development, that may be planned and if it only consists of bringing parts of machinery from outside and joining them here, then this plan could not be worked to the advantage of the country. One step further and it may be that ready iron may be imported and parts cast here. If this or the like be the plan then it again leaves some margin for failure. Of course lesser than in the first case. If the machinery could be prepared from the raw materials of the country, in the country and by the countrymen then there is less chance for failure and the whole project would be in the interest of the country without loss of energy. If it is not possible to have the metal or wood that is required for such an introduction in the country then some other plan has to be made which could serve the same purpose from other types of raw materials that are available. Such has to be the direction of planning which ultimately may result in increased production and create scope for reconstruction. Any part of a small item from the plan if left to others, naturally enough, will work as a small missing screw in a gigantic machine. With all its efficiency the machine is useless simply because of this small screw. Thus in the whole plan, which has to be agricultural in India, everything must be dependent on the commodity that is produced in this country, from the raw materials available in this country, and on its own labour. This leaves no place for leakage and obstruction. Besides every little energy that is available is directed towards production. This is not the case when one thing is brought from outside. This costs something more than what has been actually spent on it plus the energy that is required for transport and the profits of all this. All these energies are saved in case of the produce manufactured locally by local men and naturally therefore to the requirements of the locality and in its interest.

( Read before the Indian Science Congress 1934. )

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## ADULT EDUCATION IN INDIA.



Ever since the advent of the British Rule and Democracy, the question of Education has been attracting the attention of those who are trying to guide the country out of poverty naturally towards prosperity.

One of the fundamental actions of those who were destined to guide the destinies of this country was the question of education. This was enunciated by Lord Macaulay. To him Education was that which would train the needful men to carry on the administration at the instance of the masters. This is what he then called Education and at least in those early stages in India, Education meant training in the English language. This is how the word began to be used or the word was made current. Thus when we find that such and such an institution is called an Educational Institution as it usually gives training in reading and writing. Most of such institutions are today commonly called institutions of first class Educational standard. An Art College teaching upto the highest standard of examination could thus be taken as the best example.

Starting from a primary school and reaching upto the Master's Degree one only meets with different degrees of literacy which is expected to be a medium of education. So it will be found that the medium is named after the object itself. Education has got to be productive. Education must create confidence in the individual who takes it. Education must raise one up morally. Education must also make him conscious of his surroundings and must teach him his duties and obligations. In short, Education must make him all that a good citizen is. Such an Educated Individual must be an asset to any society in

which he may be for the time being placed. Looking from this standard one will only be very reluctant to look at the product of literacy or the training from the primary school to a first grade Arts College. These men are neither productive nor self-confident. Most of them are unambitious, unproductive, diffident men who do not know how to be useful to the public. This is the case of most of the educated in the country. Unemployment is rampant amongst them and they are unable to solve this question of unemployment. It is certainly paradoxical to say that the educated are unemployed and they are unable to solve their own problems. Wonderful statement is this; but it is a hard fact. What then of those dumb millions who have not had the chance of learning the three R's? Who is going to care for them when these educated man are unable to solve their own problems? It is the attempt of most of us to impart this education (literacy) to the dumb masses of our country-men who are unable to read and write, but are certainly able to do some productive work like agriculture, weaving etc. Many of these dumb men who have been working in these fields in this country, have advanced beyond the school going age. These have also to be educated. The question of these adults has also to be taken for consideration.

Apart from this let us trace the working of this primary education that is at present being imparted. In certain areas, chiefly Agricultural, it is proposed to make this primary education compulsory. The question of primary education is also being tackled by the Rural uplift workers who are at present quite busy over this affair. Even His Excellency the Governor of Bombay has given a greater portion of his farewell speeches to this subject. Social workers are not wanting who have been trying to lay stress on this type of education in season and out of season. It would therefore be fair to deal with this primary education and its effects on those for whom it is

meant. The effects of Secondary and College Education are too obvious to this assembly to need a mention.

Whenever any village is recommended for a school, usually all the boys in a village make up the necessary number. This number includes boys between six and fourteen years of age. The number of students shows a constant increase for about a period of three or four years. At the end of the fourth year almost all the boys leave the school for one reason or another and the number of students in the school comes to somewhere less than the minimum required for the existence of the school. This number remains constant if all other factors including the energy of the teacher remain constant. Let us look at the results. The teacher has to teach four or five classes as the number of teachers appointed, according to the present system, depends not upon the number of classes, but upon the number of boys. This school teacher on an average earns about Rs. 20 only as his pay per month and has got to manage a family of four or five heads on an average. The living of this school teacher being a little higher, he has naturally to earn more and consequently has to be obliged by others or has to do some other work in addition to his own duties. Not only this he has also to attend to visitors and inspectors, Local Board, Taluka and District members, revenue, forest and other officers, with Rural Uplift Workers to boot. These are the responsibilities of that post of a village school-master. With these miscellaneous duties the school-master has got to teach from four to five standards. Thus the portion of attention (of the teacher) each class gets from the five years course varies from 12 to 20 months. This includes holidays. Let us suppose that each class gets about sixteen month's straight teaching. For this about five years of the valuable lives of these boys are required. This is one drawback. Proceeding further we know that after about a couple of years when the boy takes to farming or some other useful business, he forgets practically everything about

literacy that he learnt. Thus after about five years, after leaving the school, the result is nil. A village has got a school for the last fifty years. Several old persons in the village remember their school days. But none except a few (being in the cities for their maintenance) know reading and writing. These are the results produced by Literacy. Even if one is literate in childhood he is illiterate in Adult stage.

As has been shown above, Education is that which can infuse confidence in a man and which would make himself reliant, productive, self-respecting, useful to the society, mentally and morally elevated and an object of admiration. Literacy in all its stages generally fails to do that as literacy in itself can not be education except in a very limited sense- but will all along be a means of Education. All one can acquire by literacy is reading and writing. Teach one the art of reading and writing and look at the out-put. He would make a good clerk and a best reader, and that too only in a limited field of that particular language. These are the farthest limits of literacy. One would not certainly like this result. One expects naturally more out of education as defined above. This is given by something else. But that is apart. In the villages we find that most of the adults are illiterate and yet they have some knowledge of one or other productive industry. They have to be trained for increased production, better understanding, better sanitation, co-operation, improvements, new inventions, new modes of life, new methods of administration, principles of democracy, higher moral code of life, new responsibilities arising out of these and what not. It is upon these adults of the village that the prosperity of the country depends. It is this class that has to be taught and trained at present for the future and present responsibilities. This class is illiterate as has been shown above. The literate man has failed to show the needful capacities that are required by the needs of the times. This will be more than convincing if one casts a casual glance at the circumstances that



are available round about him in the country. This method of literacy is not useful to coach these up, it ultimately proves fruitless and is responsible for a tremendous—one may say criminal—waste of national energy. If the energy could be conserved for some other useful and productive method of Education much will have been done in this line.

Amongst the methods that remain, the first and primarily important, is the method of experiment in the case of industries that depend on manual work. This method is no doubt very useful and shows marvelous results in certain cases such as demonstrations of Agricultural Improvements and Crops and other industries. When you grow a crop in a locality and convince the surrounding cultivators about the utility of the crop no other teaching is necessary for him nor is any other propaganda or reading required for him to understand the several aspects of the cultivation. He sees everything and if he is well fitted to follow, then needs very little further care. If to this method of demonstration the demonstrator adds practical training and sees that all the operations are done by the other individual by his own hand, then the training is complete and leaves no margin for the student. This presumes that those who would do this are available and that the nation has got enough means and men to have such an elaborate process. Looking at the present world and the richest country namely America, we see that it has not been possible for that country to have such an elaborate staff to do and get done operations even in the case of the most vital industries; much less can our country afford this method. An example of the Agricultural Department in this presidency will be pertinent to the point. It is supposed that this presidency has got a very elaborate propaganda staff. The question of demonstrating the iron plough has been long taken in hand and intensive work has been done for several years. The results, however, are that in certain localities the iron plough is yet a novelty. This method thus is out of the reach

of a country like India. Next method is of Visual instruction. But before dealing with this, the method of Bhajans, Kirtans, Prawachans and lectures is worth considering. This method deals with the training of the ear alone. This method is the easiest of all and could be worked at a much lesser cost. The results of this are very temporary and once the hearer sleeps over what he hears during the day, most of it is lost on him by the sound sleep. Moreover the lectures delivered in refined language do not completely appeal to him and naturally very little impression is left on him. This, of course, educates him in some aspects of the mind and brain which needs more of narration and conviction than of Demonstration. But the effect of this is heightened if this could be illustrated and the explanations given with reference to these illustrations. This, therefore, satisfies the needs within the means. This type of training is useful even in case of productive industries and has got immense potentialities. Thus the method of training by the ear and eye simultaneously is effective in producing results and at the same time it is within easy reach of the present means that are at the command of the nation. This gives the advantage of demonstration and explanation both.

Training by this method could be given by three types:— (1) Cinemas, (2) Talkies, (3) Magic Latern Slides and Charts etc. Out of these the first two are much beyond the control of the demonstrator and cannot be adjusted to the occasion. Cinemas could be supplemented by talk, but if it is desirable that a particular part has to be added for convenience or taken out for the same purpose, say for *e. g.* to facilitate the understanding of the audience, there is absolutely no scope for the same, much less than in the case of talkies. Besides these two pre-suppose an elaborate apparatus which again is very costly and at the same time very difficult to carry to the village where the real need is felt. These two, therefore, have to be rejected for

want of simplicity and for the defects (of adjustment) mentioned above.

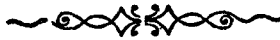
Thus the method of Magic Lantern and Charts remains as the only practicable and useful method of Educating the Adults of the villages who stand in direct need of training. This method is very simple and could also be operated by a very simple apparatus. If a box shaped magic lantern could be devised the work will be much facilitated. The box may contain the lenses, the slides and a white piece of cloth which is the only apparatus required besides the petromax lamp. The spare part that one has to carry is only the mantle of the Petromax lamp. This kit can easily be carried by the operator and is easily portable. This method combines in itself both the advantages of training the eyes and ears and naturally makes knowledge attractive to the village folk who are not accustomed to cinemas etc. Besides the cost of the whole apparatus, compared with the amount of Education that is given, is quite negligible.

Thus amongst the methods of education especially the Adults of the village this method is perfectly efficacious considering the means available and the material to be taught.

*( Read before The Indian Science Congress in 1934. )*

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## NOTE ON VILLAGE IMPROVEMENT SCHEME OF H. E. THE GOVERNOR OF BOMBAY.



It has been a pleasure to read and listen to His Excellency's addresses to the associations indicating and expounding several branches of the Rural Uplift movement.

There may be some more aspects left, which need attention of the Government as well as the public but it would be worthwhile to deal with those already mentioned by His Excellency. It is essential for smooth working that both the forces, Government and Public, go ahead with equal zeal, hand in hand, so that the cause of Rural Uplift may progress with speed. The efforts have to be made by earnest and sincere individuals who have intimate knowledge of the Village conditions and the Villager himself.

During the last three years much has been said about this question by public men, many times harping on the imaginary conditions in the Village. As one associated with the work from the inception of the idea of the first Rural Uplift Conference and as one who has gone over about 200 to 300 villages in all the Districts of the Deccan for several, Government as well as private, duties and having observed the Village conditions, primarily as a hobby to know the economic conditions of the Villager, the following suggestions have been made.

During the last three years about 10 to 15 centres in the name of Rural Uplift have been started without knowing the limitations of the question. Many of the places  
**Present position** have been used only as advertising places for the individuals who could spend some money from their pockets. These places have done very little work worth the name of Rural Uplift. In certain cases

the work seems to be mainly based on personal benefit and exploiting public sources for that end. In some cases the centres have been started simply for the sake of starting. Thus a place starts a night school with no attendance and sanitation campaign with unclean roads. These efforts have no meaning.

In a meeting of Rural Uplift workers recently held, the representative of a T. D. Association stated that the improvement consisted in planting a new variety of Groundnut and which has four nuts instead of two commonly met with in Spanish Peanut and that it was a Rural Uplift measure. He was not aware of the total outturn. The improvement consists in more weight and not more nuts in a pod. Such an introduction even if it yields more weight cannot be said to be, for the present, a Rural Uplift measure considering the present conditions of groundnut market. The first dictum that is essential to know in this case is that any introduction must be for the benefit of the cultivators. Thus (without reference to the effect) it is that in many places the subject of Rural Uplift is at present treated.

One, therefore, has to know the limitations of the introduction (Rural Uplift measure) and its effect on the cultivator before it could be called a Rural Uplift measure. His Excellency very rightly remarks that the work "should be directly remunerative and put money in the Villagers' pocket."

I quite concur with His Excellency when it is stated that the question as to what items should be selected, for work should  
 invariably be settled in consultation with the  
 "Village Elders" "village elders" who best know the situation  
 and who exactly know where the shoe pinches.  
 It is no use in season and out of season condemning the cultivator for want of imagination, good sense and what not?

Every place has its own problem and has got a different solution. This happens in even a distance of say about two

miles, this fact was evident when I undertook the preliminary inquiry of a Village named Arvi. Such a case is enhanced where a river passes between the road and the village. Without much extending these remarks, it would only suffice to mention such other factors as roads, forests, big hills, rainfall, underground water, soil conditions, raw materials, local crops, skilled labour, every small or big circumstance alters the nature of the development and changes the direction of efforts and shapes the programme to be undertaken in the locality. *It is therefore essential to have surveys of localities as a primary work and then fix upon the items of work before any work is undertaken.*

In my view, therefore, whenever any development work has to be undertaken the limitations of that item have to be studied together with the effect of the same on the purse of the cultivator. When the introduction proves to be one that will add something to the cultivator's credit and will not be detrimental to the general plan of the country then the introduction is worth adopting. For this surveys are, as has been stated above, essential which have to be followed by the application of the present day knowledge before adopting the item. In such a case the Government and public men should of course co-operate in the true meaning of that fateful word Co-operation.

His Excellency as is natural has laid a great stress in utilising the existing machinery that is available. This is always the natural and logical step when any

**Agencies** nation-wide programme has to be undertaken.

There cannot be two opinions about this question. It is only the Government administration that is complete and formidable to undertake a programme like the one that has to be taken up. One fact however has to be brought to the notice of His Excellency and which was quite evident in some recent debates in the Council and which is an every day experience with the public that the present officers who

are holding Government posts are there not because they are trained for that particular vocation but because they happen to come to it.

The last responsible man in the administration is the Mamlatdar of a Taluka. This officer is at present so much overburdened with administrative duties that it would seem cruelty to add anything to his multifarious and heterogenous duties. As a matter of fact he has very little time to devote to this type of work. So far as my experience in the Rural Uplift centre goes the duties and obligations of the responsible person are so formidable that one man's whole time is not sufficient to cope with it. This officer, Mamlatdar, further has no agricultural training as a general rule but which is at the same time very essential to the person who professes to supervise the work in about 100 villages. Naturally this officer, as a rule, is not expected to have a liking for the same.

His Excellency will be pleased to concur with me when I say that no one can successfully take up a programme, at least in the beginning, except one who has the insight and interest in the work. I may add that public men who are earnest and who would really like to co-operate in this cause of development of the village would be of the greatest use. I must also add a few lines of my own experience with Government officers, when they hold administrative posts. These officers have got a whim of their own and overrule the views of private men without even caring to give causes, except the one inexplicable cause and that is that they feel.

A Government officer with the present tendencies is a great disturbing factor equipped as he is with his present *ideas* and conceptions and absence of knowledge of outside world with the superior complex to boot. This is no fault of the individual. He has been built up like that. It is perhaps the best attempt

of His Excellency that this officer is being given an opportunity of knowing the other side. Once he gets that knowledge and outlook he is expected to improve and become more useful to the cause. But the present man being technically and circumstantially unsuited may not be the right person. For this the help of the right type of non-official with earnest desire for rural development should be relied on and the deciding voice in the organisations proposed should be of such an earnest man.

There are many amongst public men who print their names as often as is possible and show their interest, only in printing their names. Another class is of pensioners who may try to show interest and as is wont with them dabble in everything simply to spoil it. These men have to be guarded against, if tangible results have to be expected. This pensioner class is not a receptive class. The ideas of this class are finally fixed and are not elastic. They cannot be expected to have any new ideas in toto which ultimately result in hampering the cause. In this cause the young worker who is more receptive and who has a better imagination and whose mind is more turned towards the public has to be preferred.

This, His Excellency, has been written as a result of actual experience. I would, therefore, lay this also before His Excellency for consideration and request His Excellency to guard against the publicist class of public men and pensioners while planning this work. The deciding voice also may not necessarily be vested in the administrative head as a rule. This does not however mean that he must not be the head. The only idea conveyed is that the head should have complete interest in the work and should also have the needful knowledge and training in the line. Such a direction would be of great use to the cause.



The recent act on Village Panchayat of His Excellency's Government is the best act as it is creating a body quite fit to take up the work. Though the present limita-

**Further** tions of the act do not provide the fullest scope **organisation** that is desired for the persuance of this work, yet it may be hoped that the scope could be widened according to the need. I agree His Excellency when states that " a more vital requirement is unflagging service which is ready to submit to discipline. No one who has a full measure of that spirit need falter for lack of suitable instrument or opportunities."

In my view the Panchayat should be a final executive body in the village and every other body in the village must be subordinate to this Panchayat. His Excellency has suggested different Leagues for education, sanitation etc. There should be small committees the number of members of each not exceeding five. These committees should be formed to look after each of the items such as sanitation, education, agriculture etc. The chairmen of these committees should form the Panchayat which should have full liberty to decide about the village.

Even the co-operative society should be a subordinate committee of this Panchayat. In fact the Panchayat should be the only paramount body in the village and should be responsible for the welfare of the village. If this unitary system is followed most of the village difficulties could be surmounted such as small quarrels, insufficiency of grain and fodder, water supply, sanitation and others. The field of these Panchayats should of course be unrestricted. Only a formal permission or information to the Taluka administrative head should suffice for taking up steps in any new imergent line. Next to Panchayat there should be group organisation of about 10 Panchayats and then Taluka, District and Central Organisations.

This is not a new machinery that is suggested but is only a committee formed from the several existing departments sit-

ting together for consultation and planning. The last two, the Panchayat and the Group Organisation, would purely be local bodies where the Taluka Officers may at times attend or the local Guide may attend. At the Taluka the Group Organisations will send one representative each and the other officers together with the Taluka board and Taluka Development Association will attend and consider the programme in common meeting and round off the corners of the programme in the Village or Group and make them adjustable in this meeting. It is this body that may undertake surveys and fix upon the items.

This may also settle the extent of crops in the Talukas so as to save energy in transport. The District and Central Organisations should be for Technical help. Members of these organisations may attend at any of the meetings of the lower organisations. The Central Board may be called the Rural Development Board as has been suggested by the Thomas Committee, which, if worked in this constitution may show marvelous results. Such an organisation would render it easy to detect any disease of cattle or crop or men and direct immediate help to the afflicted. This procedure may not incur more expenditure, except a very small amount.

The use of magic lantern with different sets of slides has been found very efficacious. The magic lantern attracts the cultivator and is a means to give him the know-  
**Education** ledge that is intended for him and entertain him at the same time. This is not the occasion to dilate on the efficacy of visual instruction but as a result of the work of my colleague I can definitely say that this is a much useful means. The training in literacy in the villages has been found upto now to be a waste of their time and energy.

Every Village adult who cultivates land in India is mostly illiterate. This fact I have shown in my paper sent to the

Indian Science Congress to be held in Poona in 1934. Literacy is a very powerful means of obtaining knowledge, but the masses of India, be it noted, are so vast and the development desired is so much that literacy would fall short of the requirements at least to-day. This literacy may go on but quicker means have to be found. Besides in case of literacy, in addition to one man, the materials required are so many that under the present circumstances the villages can ill afford it. Myself and my colleague have devised a Magic Lantern which could be worked by a 300 C. P. Petromax lamp. The difficulty of electric light or carbide explosion is done away with. The cost of working this lamp is also near about an anna or two. This requires less material and saves time.

It is very clear that this programme will certainly require some additional expenditure. The working of the Panchayat also with its multifarious responsibilities and **Finances** duties will need money to procure the means that would be required to achieve the end. This money could be created by some adjustments. At present some energy is lost in transport. It is desirable that most of the energy in transport wherever it is duplicated could be saved to the village to the benefit of the cultivator. In certain villages where there are absentee landlords this case always happens. The grain produced in the field is taken to the Taluka place and again brought back when required to the village. In certain cases this happens due to intensive cropping of a commodity. This energy could be saved if there are grain depots and if the cropping in the village is adjusted to the requirements. If there is a powerful Panchayat this could be achieved and the energy so liberated could be used to the betterment of the village.

The second factor that is worth considering is the sale societies, and depots. The produce in the village if accumulated in this depot and sold by the depot, the price realised could be

controlled and the money usually taken by the middleman could be saved to the cultivator. This money could very well be utilised for the welfare work by the Panchayat. Similarly with grain and fodder. The cultivator sells the commodities at any price and pays up the dues. The Panchayat should come forth to the assistance of this man and pay him at least his cost of production that he might have incurred.

This is easy if the type of Panchayat that is suggested is working in a village. This method will also stabilise the price and stop the cultivator from ruin. Thus the marketing question also could be solved and will bring in some money to the cultivator. Besides the Panchayat could see through the depot that they have enough corn and fodder to suffice for the needs of the Village all the year round. This will avoid the borrowing for this purpose. There will be two fold saving. The energy in transport would be saved and the rate of purchase will be low.

The third source that is to be tapped is the Government treasury. The treasury should contribute about 10% of the total receipts from Land Revenue and Local fund collected from the village to this cause of the village. This much at least falls due to the village from the collections that the Government makes.

In the beginning some more grants from Government, and wealthy citizens would be required to undertake lasting and costly improvements but later on the above mentioned sources would be sufficient to the Panchayat to maintain the working.

( *Written in 1933* )

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# A BRIEF NOTE ON VILLAGE INDUSTRIES IN MAHARASHTRA



Maharashtra is primarily constituted of six districts *viz.* Nasik, Poona, Satara, Shalapur, Ahmednagar and Belgaum. The two districts of Khandesh and three of Konkan together make up the Maharashtra on linguistic basis.

Out of these Nasik, Poona, Satara and part of Belgaum together with the adjoining states constitute one group. There is hilly area and the rainfall averages between 30" and 40" in a normal year. The cultivable land has got a proportionate hilly area in case of this tract. This hilly portion affords grazing for cattle. There are forests on these hills which have very useful timber or firewood on them. The roads have ups and downs. Many of the villages have no roads at all being in the heart of the deep valleys that are often met with in this tract. Many small villages have kacha roads and have to be approached in a bullock cart, on horse back or even on foot. During rains when the rivers are in floods some villages have no entrance at all. The same situation is met with in certain parts of West Khandesh also.

The crops usually found in this area are both Kharif and Rabi. Kharif crops are taken on lighter soils while Rabi crops are taken on soils which can retain water for a longer period. In cases where underground water is available irrigated crops such as Sugarcane, Termeric etc. are taken. In certain cases fruit plantations are also made. In certain parts of Khandesh advantage of both the monsoons is obtained. The temperature in this part is higher. The main crop is cotton while the other crops

are the same as in other districts. Groundnut is a common crop in all this area. There are other oil-seeds such as Karala and Karadi but the more common oil-seed is Groundnut. The cake is used both as a manure and a concentrate for the cattle.

In other districts except Konkan the rainfall is less *i. e.* less than 25" on the average. These districts are East Khandesh, Ahmednagar and Sholapur mainly. There are no hills in these districts and most of the area is plain. There are very few forest trees like the previous tract. The soils are heavy and grow Rabi crops mainly. In lighter soils Bajari and such other crops are grown. The main crops are Jawar, Wheat, Cotton. Groundnut, Til and Karadi are the main oil-seeds. Sugarcane, Termeric and such other irrigated crops and fruit plantations are found where it is possible to tap underground water. Traffic in these districts is very easy as the rainfall is less and presents no difficulty.

The Konkan presents quite a different situation. The rainfall is very heavy amounting to a maximum of about 250". This area is chiefly hilly. The climate is humid. The temperature is low, and the vegetation grows profusely. There are numerous plants from which products could be made. The people too are very industrious. Amongst the vegetation Bamboos are found to grow very profusely specially in this tract. Other plants such as Mango, Jack fruit, Kokamb, are also in abundance and which may give very useful side occupations. There is very little level area in these districts and the percentage of good land is very low in any given locality. Much of the land is Varkas and the above-mentioned fruit trees grow in this area. This land is necessary to the locality from several points of view but these do not come in the scope of the subject. There is ample grazing during some parts of the year, but during other seasons this practically reduces to nil. This season being the limiting factor, the crops in this tract are Rice, Val or Pawata, Tur,

and others. Some Suran and other root-crops and tubers are also grown wherever irrigation is available. These are grown on even as small a scale as a few plants in the home garden. The plantation of Sag is important in the economy of this village life and practically every owner grows these plants in his varkas land. This is a source of income to him. The branches of the several plants that are found in the varkas land are useful at the time of the rab which is a necessary operation while preparing the seed-bed. This cutting has a direct relation with the drinking supply of these localities. Further discussion about this does not however suit the subject-matter of this discussion. This farm practice is however very ingeniously adopted. Thus every owner has necessarily to possess a few plants of his own in his varkas land. These usually include as stated above Bamboos, Mango, Jack fruit, Kokamb, Kaju and others. Each owner also has some Malai land along the river side where he usually grows some vegetables during the cold and summer seasons. Traffic is very difficult in this locality and many times one cannot enter a village without the help of a small boat. There are several creeks in this tract as the sea is very near. Many times traffic is easier where these creeks are available.

The village industries vary according to the different tracts and the circumstances that are available. The live stock also varies and the nature of the residents also changes according to the environments. Thus each of the tracts will vary in the nature of the village or home industries that would be found in any particular locality. The main factors that may determine these would be the raw materials that are available on the spot, the time that is at the disposal of the residents after finishing their agricultural operations, the amount of skill that they could command for that occupation, the needful marketing facilities and the demand. If all these could be favourable then and then alone that industry can thrive. Besides all this foreign competition is also a very important factor that has to be taken into account.

Taking the tracts one by one in order the following industries are done mainly as secondary occupations in most of the villages. In this connection one fact has to be borne in mind and that is that all these industries are mostly secondary occupations in the villages. Thus in the first tract we find the following secondary occupations:

- (1) Carting. (2) Oil seed crushing. (3) Tanning.
- (4) Preparing of mots and other leather goods such as footwear. (5) Preparing of ploughs and other implements and materials. (6) Rope making and other requisites such as sweepers etc. (7) Khawa, Butter and other milk products. (8) Animal breeding. (9) Bone collecting. (10) Earthen pots, tiles, and other requisites. (11) Ferry making.

These are some of the industries of this tract. They are hampered or displaced by others as will be shown later on. There is one clear result from this displacement and that is, that the agricultural returns are lessened and some had to leave the land and go to the mills. The following is the situation of the above industries on account of the new introductions that have been made. There is double loss. Not only that they have displaced the existing industry but they are in addition responsible for removing the existing wealth to a place whence it will not return to the place of origin in any form directly or indirectly. Then taking them in order—

(1) Carting have been displaced by the motor in most of the part of this tract. The bullock is idle nearly half the year and thus unproductive during this period. The working efficiency is thus reduced to half or even one-third taking for granted that the health of this animal is maintained without cost even when he remains without work.

(2) Oil-seed crushing was another industry which has been displaced by the iron ghani and oil engine and has reduced the efficiency of the bullock.



(3) Tanning has well nigh-disappeared. This question, it is learnt, is at present before the Servants of Untouchable Society and is being studied in detail. This therefore, is only mentioned.

(4) Preparing mots etc. At present this mot is being displaced by the iron mot which is manufactured in India. The increased irrigation by canal has also helped to a large extent to reduce the manufacture of these mots, as flow irrigation is cheaper than lift irrigation. This is evident along the Godavari, Prawara and Mutha canals in the Ahmednagar and Poona Districts.

(5) Wooden ploughs. They have been as a result of the departmental propaganda displaced by the iron plough. This industry therefore has also largely suffered by the introduction of iron plough.

(6) Rope making. This is suffering on two counts. One is the departmental propaganda for using wire rope and secondly on account of the import of outside rope. Also thirdly by the introduction of the rope making machine.

(7—8) Khawa and other products of milk and animal breeding are co-related and are dependent chiefly on grazing areas that are available. Most of the best grazing areas are being controlled by the forest department in one form or another. One is reserved for cutting grass etc. The other form of Government control is indirect. It is primarily exercised for preserving costly timber like Sag. In order that these plants may not be destroyed cattle are not allowed to graze freely in this area. If per chance any of the smallest plants is destroyed the cultivator has got to pay a very heavy penalty. He therefore prefers to leave the area alone. Thus the cattle do not get enough grazing and their number is decreasing. This industry is therefore dying slowly due to this control, direct and indirect. This fact has been observed at a place about 17 miles from Poona.

(9) Bone collecting. This was being done by Mahars, but now-a-days has been given up. This is a very good manure and keeps supplying nutritive ingredients for a long time.

(10) Earthen pots etc. were being manufactured in the village. This is now being displaced by metal and tin as well as enamel pots.

In case of the second tract *viz.* East Khandesh, Ahmednagar and Sholapur the first six are practically common. The others differ. Instead of cattle breeding and animal products there is ginning, spinning and weaving. This industry is fast being taken up by machinery and all the skill and labour in this industry is being utilized in mills. The situation of other industries is practically the same. West Khandesh had the milk products industry as there was some grazing available. Cotton-seed also was available as a concentrate. With these two the part was famous for ghee. But continuous cotton cropping in the same plot during the war period reduced the fodder supply and the cattle were ill-fed. Then followed the famine period and the industry was practically lost in this district. This tract therefore does not show great variation in the industries. Many of these facts are made more clear in the paper Rural Problem. The other two industries of bone collecting and earthen pots is suffering in the same manner as in the first case. In case of both the tracts the Mahars who were originally village Kamgars and who hold vatans for service that they were expected to do were doing bone collecting work. Now they have no administrative work as it has practically been taken up by Government.

As the work has been reduced they have taken up to collecting fire-wood and cutting trees which was previously done by a class of Marathas called the Arkas. This class is now displaced and has lost its original working efficiency. The above list is by no means exhaustive. This is however suggestive enough and

shows the disturbance that is being caused in the economic condition of village life.

The Konkan presents quite a different tract. This has got its own peculiar industries and are not much displaced except for the plough which is slowly replaced by the iron one. The motor car plays an important part in traffic and the bullock cart traffic is practically nil on trunk roads. This has reduced the working efficiency of the bullocks, *i. e.* the animal has to be fed as before while the return in terms of work is less. The industry of the Chamar for foot wear is just as it was and is not much disturbed so far as local conditions are concerned. But they are not able to export which they were previously doing. This income side on account of export has stopped. There are other industries that could be developed. The following are a few of them :—

- (1) Export of mangoes.
- (2) Preparations of dried mango juice.
- (3) Preparation of dried Jack fruit, outer covers of Kokam fruit and oil from the seed.
- (4) Cane and Bamboo work such as Tables, Chairs etc.
- (5) Khas tatties.
- (6) Husking of rice at home.
- (7) Preparations of rice products such as Pohas and others.
- (8) Cart making and norias.

These are some of the industries that could be developed in Konkan. Out of these husking of rice has been practically taken up by mills. This polishing by mills has got many disabilities which are well-known to need mention.

The first four and the seventh could be developed to a very large extent as it would cost very little at the place of manufacture except labour which is available in large quantities. Few utensils are needed to do this and could as well be prepared

in the village itself. Foreign trade could even be developed for this commodity.

The above is a general idea of the situation and the points of leakage as well as development.

One industry can easily thrive in this part as well as in the others and that is of fruit preserves. During the season when fruit is abundant it is practically wasted. A small attempt is made this year and has given encouraging results. A crown capping machine has been designed and has given satisfactory work on a cultivator's farm. This industry has good scope for development which will have to be dealt with separately. Besides this there are some other industries such as preparing rugs and Kamblis. These will be accompanied by sheep-keeping. Poultry is a common home-industry all over the part. Where good leaf plants are available, Patrawal and Drons could be manufactured.

Several other industries could be mentioned which have been taken up or are being taken up by machinery as quick work is desired. No attempt has however been made at being exhaustive. Some of these facts have been made clear in the accompanying articles. These are being developed in cities. Mortar crushing is one; cement concrete buildings is another. This is liberating the labour and skill that was utilised in cutting and preparing stone for buildings. Re-inforced concrete buildings are displacing wood work. Iron girders have reached even villages and have displaced wood. Tiles have been displaced by corrugated sheets and will practically ruin the trade. These introductions are working very adversely on local enterprise. The original village workers are not able to manufacture the above commodities and have no other better work to do. This tale is never ending and a stop has got to be put to it. This situation is available all over the country as in Maharashtra and needs special study of the problem, which alone will prove the magnitude of the question. The reorganization of these may even mean national regeneration.

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## UTILISATION OF FRUIT IN MAHARASHTRA



With the advent of the canals fruit Plantations are increasing. They have increased rather at a greater speed during the last quarter of a century. Before this period the plantations were few and used to fetch better prices. It therefore paid to spend money on them. These plantations chiefly consisted of the Mango, Pomgranate and Guava. Even these were not grown on a very large scale. The old famous gardens were planted chiefly by rich persons at a high cost which they alone could afford. In these were found some precious varieties. The Khed-Shiwapur Gardens of the Peshwas and the Menawali Gardens of Nana Fadanawis are such famous gardens in the Deccan. During the rest of the century the times were not quiet and no plantations were made. With the advent of the canal irrigation and undisturbed times the plantations are on the increase during the last quarter of a century as stated above.

The consumption of the fruit produced is not however keeping pace with the fruit produced. It is still believed that fruit is a commodity to be used only by the well to-do and is not still used by the middle class man generally. As a matter of fact if all seasonal fruit is used during that season it gives the power of resisting disease to those that use them. This is due to the different Vitamines contained in them. This seasonal fruit-diet thus helps indirectly to prevent disease by inducing in the blood the disease resistant capacity and thus indirectly checks the growth of the germs of disease. Fruit diet is valued to a very appreciable extent in the western countries so much so that it is included in their daily diet but we, where a variety of fruit is grown, do not value it to any appreciable extent. We still believe as stated above that fruit diet is meant for the well-to-do only.

The middle class does not use it even once in a week. The lower classes therefore as is obvious do not use it at all except perhaps the Mango, Guava and Jambul. We have as yet to learn the importance of fruit diet and know that it gives us health and saves a major portion of the doctors' bill.

One would be misled if one were to conclude from all this that enough Fruit is not produced in the Deccan. During certain part of the year it is produced to such an extent that much of it goes to waste. Much of the Mango is wasted in the Ratnagiri district in the beginning of the mansoons. The waste thus caused by ripening in a very short period in the Ratnagiri District, is very difficult to estimate, but one may certainly say that, if preserved, it would produce thousands of rupees at least though not lacks and crores. Similar situation is at times available in Belgaum also. In the Poona market Santras, Mosambees, Lemons and Figs meet with the same fate. Guavas are likewise spoiled in the Poona market. In the Nasik District grapes are produced to a large extent and the glut period comes in March and April. They are sold practically dirt cheap. Jambul is a typically useful fruit and one finds roads strewn with these. This type of waste one sees every year with open eyes. We find that many of the waste fruit have very good medicinal uses. Even with this they are allowed to go to waste with the existing scientific knowledge of the 20th century.

One can imagine two reasons for not utilising this wealth. One of them is likely to be want of time while the other may be idleness. If there is really no time on hand then it would really be a healthy sign but it does not seem to be so considering the lists of the unemployed. The advanced science of to-day has solved the problem of the industrious man. The only reason that could be stated therefore seems to be the idleness of the persons who are unemployed. There are other reasons also such as the capitalistic tendency, competitions and others. But it would

not pay to say more about these as the discussion would not be palatable. In all this the point that has to be decided is the division of the returns between capital, intellect and labour. If this could be settled most of the controversy would subside. A discussion of this would be beside the point, though worth making.

One fact could be stated and that is that this excess fruit could be very well utilised if efforts are done in the right direction at the proper time. Many useful products such as Juices, Jams, Jellies etc. could be prepared and made available during the year if proper methods are utilised. The above mentioned fruit is produced in excess during a period of about two to three weeks in the year. During this period it is either sold at a very low rate or goes to waste ( in places like Ratnagiri ). Fruit, if preserved, would not only be useful during the whole of the year but could also be exported to other parts of the world where it does not grow. If therefore attempts are directed towards preservation of fruit they would be in the proper direction. This would be successful in the fruit producing centres of Maharashtra. If the unemployed educated classes work at this in these centres this may give employment to so many and at the same time put out useful products out of the waste or at least excess. The following table gives a detailed idea of fruit production in the Deccan.

[ Table is on the next page

**Fruit Acreage in Maharashtra.**  
(From Marketing Report 1932-33.)

	Mango	Lemon	Mosambi	Santree	Pomegranate	Grapes	Figs	Guavas	Papaya	Total
Poona	49	481	0	1671	994	34	481	883	205	4798 4749*
Satara	60	119	93	40	292	9	4	603	0	1220 1160
Sholapur	123	178	0	83	105	0	0	212	27	728 605
Ahmednagar	262	404	2154	664	168	51	20	402	476	4601 4339
Nasik	886	208	0	80	29	864	3	534	196	2800 1914
E. Khandesh	59	141	191	769	0	4	1	589	101	1855 1796
W. Khandesh	212	157	0	28	0	0	0	134	133	664 452
Thana	3112	5	0	0	0	0	0	4	5	3126 14
Kulaba	602	4	2	0	0	0	0	7	0	615 13
Ratnagiri	5398	0	0	0	0	0	0	0	0	5398 0
Belgaum	824	34	0	0	15	0	0	246	0	1119 295
Total...	11587	1731	2440	3335	1603	962	509	3614	1143	26924 11587

Total after deducting acreage under mango... 15337

\*The second figures in the total column are given after deducting acreage for mango.



The following calculation will show the product that could be obtained from these plants.

About 300 plants of each variety except the Mango and the Papaya are planted to the acre, usually leaving a distance of about 12' between two plants. Each such plant gives about 100 lbs. of fruit per plant. The Mango plant bears according to the variety and age. Papayas are put in at a distance of about 8'. About 600 such plants could be put to the acre. If according to this scale only the Lemons, Mosambees, Santras, and Pomegranates are considered they make a total of about 7500 acres. The number of plants at this rate of 300 per acre works out to 22,50,000 and the total weight of fruit in lbs. at the rate of 100 lbs. per plant would work out to 22,50,00,000 lbs. Jambul fruit cannot be measured but one may say without much error that the total fruit available would be some million lbs. No measurements are possible as most of the plants are either by road side or along nalas. This is a general idea of fruit available in Maharashtra.

All this huge quantity of raw material is available and is not put to proper use. There is expected to be an addition to fruit plantations in the near future when it is expected that larger quantities will be produced. These will have to be put to proper use. If therefore attempts are made to prepare durable products out of this perishable raw material it will be in the fitness of things.

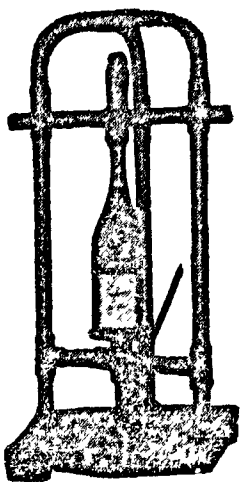
Before starting to work in this direction several factors will have to be considered. The first and foremost will be that of the machinery. If it is required to be imported then this would be a factor that will remain indicsive, suppose a part of such an imported machine goes out of order, the work will have to be delayed till that part of such an imported machine is either replaced or repaired. This would mean obstruction in work. At times, as is many times seen, it would not be possible to repair it and one may not be able to get its spare parts. At

times it may not be possible to pay the cost of it and even if one is ready to pay the part may not be available. Since the fruit season is a very short one, ( about 3 weeks ), no preservation could be done during such a season. It would therefore be advisable to manufacture ones own machinery locally.

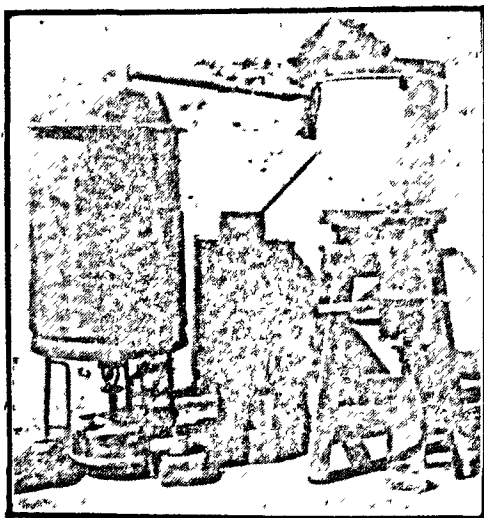
If this required machinery could be manufactured from material available locally and from local skill the price would not vary to a very great extent and may change only slightly. If these prices are nearly fixed, a margin amounting to this fixed sum would be maintained by the manufacturer and thus help in standardising the prices of the commodities as the production also could be adjusted.

This principle has been adhered to in the efforts that are being done by the writer in preserving fruit Juices. These machines have been designed from materials available in the local market and skill available locally. The three machines or rather appliances are :—

- (1) The crown Capping machine.
- (2) The distillation apparatus for distilling oil from the rind.
- (3) The press for extracting jusce.



**Crown Capping Machine.**



**Distillation Apparatus**

If an Engineer could have helped in this it would have been possible to prepare even better appliances but it is a sorry affair that help was not forthcoming ; unpalatable though it is it has to be stated with other facts.

There are other points that need consideration in case of Maharashtra. One is the motive power for working the appliances. Maharashtra does not produce coal or oil. All machinery therefore worked by this power is out of question. Such powers as wind, water-current and electricity may be made available. But it will take at least half a century for getting them cheap and indogenous. Water currents and winds are in no way reliable as permanent sources and have therefore to be discarded. Thus the only powers that remain and that would be available at hand would be the human and animal power. So whatever machinery that is manufactured has therefore to be adjusted to the above mentioned human or animal motive power.

The next point that needs consideration is the skill of those for whom the machinery is designed. If the machinery is very delicate and the operator is not skilled to that extent then the machinery may not be useful as it would go out of order very soon. He must therefore have a strong machine suited to his rustic ways.

When the available power and appliances are thus limited the quantity produced will naturally be limited to a particular maximum. In order to get a clear idea of the same, some other factors than the above will also have to be considered. This will include besides raw materials bottles and other requisites in this manufacture. The transport facilities will also count in this. At present we have many glass factories but the bottles in this market are chiefly foreign. The ordinary bottle used for medicines and such other purposes is available but crown finish bottle is not as yet available. It may be possible next year.

according to the promises of Ogale Brothers. The 24 ozs. beer bottles cannot however be available at the market rate for many a days to come. This bottle will have to be purchased in the city and transported to the place of manufacture. The road facilities must also be good enough to transport the small bottles without breakage to the central place. When all these factors are considered the production will be considerably limited. Considering the extent of fruit plantations one finds that small holdings are common and it is these who need real help. Big plantations may number less than 10 in the whole of the presidency. So this fact also would help the project of limited production.

Producing centres on a small scale, if started, would help to solve the question to a certain extent. The producing unit should manufacture upto a limit of 5000 lbs. of produce annually in the first instance and as there is no definite market for the products at this stage. Market has to be created for the products that will be manufactured. As the market is not fixed it will not be desirable to start producing on a larger scale than 5000 lbs. There is another point that needs consideration. To produce these goods one requires greater cleanliness and accuracy. If the production is on factory scale this is not so strictly observed as mercenary manual labour has to be employed on a large scale. It has therefore to be manufactured by people who are concerned with it for profit and not pay.

When production is limited it becomes possible to watch every process. The next point that draws the attention when a big project is undertaken is the special type of apparatus of each operation. The operator that is required must also be of greater skill and consequently of higher remuneration naturally enough he is useful for that work only and none other. If that work could not be given to him for the whole of the day, then he lies idle, while he has to be paid for that time. This business

keeps the man busy roughly for about three weeks per fruit. That means the factory may get work so far as Juices are concerned for about 120 days. The workers, if employed, have to be idle for the rest of the period and it would not pay to employ expert labour for the whole of the year for a working period of 120 days.

Taking into consideration therefore the above factors *i. e.* the cleanliness, the skill, the duration of the waste etc. this idea of limiting the production gained ground and the normal limit was adjusted to be 5000 lbs. Steady labour of four persons is enough to produce the above quantity with cleanliness. The built up space required for this is about 15' x 20' and some open space outside it. If the small extent of the fruit plantations is considered the above plan may be appreciated to a greater extent as four men are usually available in a family and a residential space of 15' x 20' is also available. Fruit is available on his farm from which an intelligent cultivator will be able to manufacture the finished product. Thus it would develop to be a good industry. The apparatus designed also stands to the needs of such a home industry.

The next question that crops up is of the sale of the goods produced. If there are more than one such centres and if they combine in a co-operative body then they can start a central body. This will be of use in advertising the goods in one lot and also purchase of bottles and such other requisites in larger consignments. This may mean cheaper rates. Besides this such a central body should conduct experiments to improve the quality of goods and would control cleanliness and the methods of production. This would ensure the uniformity of the products. If this industry of preparing useful things out of waste or excess could be organised in this way some more money could be produced out of this waste or excess.

With this idea attempts were started to establish an organisation like this under the name of the Rural Products Company.

Whatever the starting point this is not going to succeed without the co-operation of experts in different branches. One man cannot be expected to know every thing and as such co-operation is essential but till such co-operation is available individual efforts even if defective, have to be continued. Attempts therefore are being made in Poona in this direction.

The above discussion has been made with the perishable fruit in view. Besides this there is other waste which also is to be included in the Jurisdiction of the working of the above Organisations.

A small attempt of manufacturing 5000 lbs. of goods on the above lines would on an average require an investment of about 250 to 300 Rupees which would include the cost of utensils and appliances, with about 300 Rs. as capital and the above mentioned space of 15' x 20' and the ready help of 4 persons about 5000 lbs. of goods could be produced. The other expenses will vary according as the price of fruit. This, thus may develop to be a Home Industry if done on the above line.

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## WATER SUPPLY IN THE VILLAGE.



Amongst the many deficiencies in the village Water Supply has a prominent place. In most of the villages at least in the non-alluvial area the question at times assumes the position of the only factor about the existence of the village in that particular locality which gives the residents their food. Though they can produce the needful food they cannot produce the needful water unless nature stores for them the same from the rainfall. Rain water when utilised by plants produces grain for the man and fodder for the cattle. To digest and utilise for the body the grain and fodder that is produced by rain water again rain water is required in another form which is stored below ground level by nature. This storage lessens and increases according as man behaves and uses his intellect. Our predecessors were trying to help nature with their intelligence and trying to get more water for themselves.

Coming to the Deccan trap area there is scarcity of water supply in the Konkan and the Desh tracts. The first has got large quantities above 100" of rainfall while the other has a rainfall of less than 20". Both the tracts feel the want of drinking water in villages in the months of April, May and June. During the old days two operations were introduced in the usual Agricultural operations which helped a great deal towards conservation of moisture. One of them was to stop evaporation through the foliage of the plants by cutting them down in the month of March when the humidity is the least and consequently the evaporation is the most. This material that was cut was used for burning the soil and destroying the affecting influences on the seedlings that are grown in this plot. By this process of cutting, the water that would have evaporated

through the plants, is made available to the springs which reduce in flow by this time (cutting the foliage). This is due to the harder layers immediately below a few feet.

If we come to the Desh tract the most important factor in Agriculture is bunding. This serves many purposes but the most important out of these is to stop the flow of water and allow it to percolate down in the lower areas which is mostly porous in this tract. This gives the cultivator a good level land and a saturated subsoil or rather a moist subsoil helping to give him a good crop in the season and good water supply for drinking in the summer.

In the transition tract both these are adopted as the case may be. The transition tract itself consists of a mixture of these two tracts and is on the boundary line of both and as such the methods adopted are a mixture of these two. This has a medium rainfall say upto 35" as an average and comes on the eastern slopes of the western ghats. It would be interesting to note the geological situation in the Deccan to get detailed idea about the Deccan Water Supply with the villages of which we are primarily concerned.

Deccan is a peculiarly formed area and has its peculiar situation. This is formed from Lava poured out from big fissures. This Lava spread out in layers one after the other with a thickness varying from 2' onwards. There was a break of some thousands of years. The portions on the surface of the layer weathered and formed softer material. Other outpourings of Lava came and spread over this soft material and so on. This thickness of Lava layers is believed to be near about 10000'. It is believed that originally the fissures opened by the subarrenean activities at the bottom of the sea where the earth crust was the thinnest and through that emitted Lava. This is the origin of the Deccan plateau. The weathering action since the last outpouring has now created for us, the valleys and hills, the ups



and downs and the nalas and rivers. The underground structure is equally hard. This has very thin soft layers. While these hard layers were being cooled they occupied lesser space than what they did when hot. Naturally at intervals small cracks were formed which helped to connect the upper and lower soft or decomposed layers and thus established communication, between the upper layers and the lower layers just as by piping. In this way the hill tops were connected to the lowest layers. This communication plays a very important part in the question of water-supply in the Deccan. These layers are formed of a hard mass of rock having a homogeneous structure. This is very difficult to decompose and the best agencies for the same are rain, sun, and wind. The components are not acted on by chemicals to any great extent. The exposed layers are decomposed by the action of the above agencies and softer material forms on the exposed surface. This decomposition goes on in stages. The very fine and loose material is called soil, the bigger material is classed as coarser soil and the further stages are called murum, beyond that soft and hard rocks. This soil, it will be clear, is nothing but the hard rock split into smallest particles, mixed with organic matter and some bacteria from the organic life. This is the structure of this formation from the surface to the lowest levels. At the top is found softer and decomposed fine material, then coarser soil, then murum, then soft rock and lastly hard rock. The rocky portion has soft decomposed layers alternately, called the murum layers.

During this formation at times, it so happened, that gases were emitted and they got enclosed in the Lava. The gas escaped after cooling and left a hollow. These hollows also are met with in many places in the high hills of the Sahyadri. Besides this there is a formation called Dyke. This is a pillar like structure coming up straight near the surface. This stands across the formation. This being the internal structure the

underground water-supply is naturally affected by the hardness of the formation. It does not allow penetration of water except in the cracks and the soft murum layers. It may therefore be conveniently said that there is a net work of underground system in the trap area and not an underground tank system as in an alluvium. The idea of finding out water at any place, therefore, is out of question so far as the Deccan trap area is concerned. The quantity of underground water will necessarily depend on the sources of supply to this piping system.

The main and probably the only supply that is responsible for water that is found in this piping system or cracks is the rain water in one form or the other. It may be a surface accumulation natural or otherwise or may be underground accumulation in the lower levels or the cavities that might have been left during formation. The softer material *i. e.* the soil also holds moisture and whatever water is found in the gravitational form flows down to lower levels through this piping system of cracks.

Rainfall thus is the main factor in deciding the total quantity of water. The other factors that are necessary are the absorption of this rain water, and the retainment of the same. The fourth is making this retained water available. It is on these four that the water-supply question depends.

The best condition of rainfall from the water-supply point is that the rainy conditions should exist for the whole of the year, in mild showers, so as not to start big currents. The quantity also should not be so much as to cause over saturation and consequent run-off. Whatever water falls on the ground should be allowed to soke in. The temperature should be low so that lesser evaporation may take place. This condition however is ideal and does not exist in the Deccan.

In the Deccan the rainfall is limited to four months and whatever amount is received is received during this period. The range of this rainfall varies from about 25" onwards to a maximum of about 250" at certain places. The Deccan is usually divided into three long strips extending from North to South, according to the amount of rain water received. In these tracts the temperatures change, the humidity varies and as a consequence the total evaporation varies in quantity which affects to a certain extent the underground water-currents of the locality

The main tracts are, coming from West to East, the Konkan or the Mawal, the Transition and the Desh. The first gives a rainfall above 100" concentrated as stated above in four months. This is adjoining the sea, and has a higher humidity. The variations in temperature are not great. The next tract is the Transition tract. Here the rainfall varies from 20" to 35" concentrated in four months. The temperature variation is much as compared to the Konkan and it varies on the average from 40° F. to 105° F. The humidity also shows a greater variation. Consequently there is a greater effect on underground water. The third tract is the Desh and has a rainfall of less than 20". The temperatures are high and the range of variation is less. The humidity also is less. These factors are not favourable for underground water-supply.

The general climatic conditions prevalent in all this area are not very congenial from underground water-supply point of view. After the rains, comes the cold season when generally the temperature is low. After this follows the heat period during which the humidity is low and the evaporation increases.

This climax is reached usually in April or May as the case may be. After this the moist winds begin to blow and the

humidity is increased. Naturally evaporation lessens and in certain cases the water-supply begins to increase. This is a case of common occurrence.

The rainfall received in the Deccan during this short period is not however very evenly distributed over these four months. In the beginning there are stray but heavy showers which give a little run off. Then comes a break and then come steady showers, extending for days together. These showers are not very heavy and give great scope for percolation. There are off and on breaks but this continues for two months and a half and again there are heavy showers which give a run off. Thus during these four months' period the effective rainfall from the point of view of underground water-supply is available during these two months and a half. These small showers that precipitate slowly do not wash away either by superfluity or by high gradient. These small showers increase the underground water-supply. The next important factor that affects underground water-supply is the permeability of the substratum. This varies in different tracts. In the Konkan the substratum is hardest so much so that many times the hard structure is exposed to the surface. In the transition tract this substratum is of murum and below that comes the rock. In the Desh tract the substratum is pervious and there is ample scope for permeability of water.

The third factor is that of gradient and a subsidiary factor with the gradient is the ups and downs. These affect the quantity of the underground water-currents to a great extent. In the Konkan the gradient is highest and leaves least scope for permeability of the water that falls on the hills. Besides this the impermeability of the substratum also does not allow percolation and ultimately with the highest rainfall and humidity with lower and less variable temperature, the underground water supply is the least due to this one factor of gradient. There are very few ups and downs that may hinder the flow of water.

The transition tract comes next. The gradient is not too much, except along the hill side. The subsoil conditions also allow percolation. The humidity and other factors are medium. There are several ups and downs and give good scope for percolation. With medium conditions this tract is perhaps the first in yielding underground well water.

The Desh tract has got the least gradient. The run off is very little. The subsoil condition is also very favourable. But the rainfall and humidity are low. There are ups and downs in the form of basins. The lowest line in these basins give a good permanent supply to some wells.

Thus the best tract for water-supply is the Transition, the next comes the Desh and the last is the Konkan.

In all these three there is one factor that affects the underground supply. This factor is the vegetation and other means that hinder the flow of water and allow great scope for percolation. The more the vegetation in the catchment area the greater the quantity of underground water that could be tapped. This is applicable to all the three tracts. This has some exceptions where the vegetation grows only on a small surface layer of few feet. Though this gives greater scope for percolation the substratum in such cases is hard and the gradient also is greater. Naturally whatever water is absorbed is drained away to lower levels ( the rock being homogeneous ), when it meets this hard surface. In such cases the supply falls short. The water-supply increases if the evaporating surface of this vegetation is cut out. Such conditions are met with in the Konkan tract. It would be interesting to note that in this tract there is a practice included in the Agricultural operations of the tract to cut the vegetative portions of plants for Rab. This is done in February or in March which happens to be the exact time, when the underground supply falls short and the temperatures begin to increase.

The under ground water-supply in the Deccan as also anywhere thus depends on *the amount of rainfall, the permeability of the subsoil, the retentive capacity of the subsoil, the evaporation from the surface, the gradient of the locality and the vegetation and ups and downs etc. that helps percolation to the lower levels.* These factors are not fully favourable to the Deccan as has been stated above and at a given place some of them are favourable while others are not. And the general statement that one may make, may be that this is not a favourable tract for underground water. Whatever water is available is available in cracks the definite positions of which one is not able to make out from the surface. This situation makes it doubtful for people that want to tap these hidden sources. Pure water is perhaps more necessary than any worldly commodity and everybody is in need of it. As a consequence there came up many methods to locate this as approximately as possible, so much so, that it assumed the form of business.

Considering the above points the main factors that will have to be controlled, when the improvement of water supply in the villages is to be considered, would primarily be the saturation of the catchment area with the rainfall that is available during the year. The second point that would require attention would be retaining the same and not allowing it to evaporate and the third would be to tap it at the proper place.

In order to see that most of the rain that is available during a certain part of the year has to be stored, several projects will have to be undertaken, at different places. In certain cases putting in vegetation in the catchment area will pay while in others it may pay to put bunds across the slopes. In a third case diversion of currents from a rocky portion to a portion where absorptive layers are accumulated may be useful. Making reservoirs and impounding water is a common method adopted. Last but not the least comes the method of putting dams

small or big as the case may be to water currents and making the water available during the whole of the year. These have to be adopted with certain variation from place to place which helps to increase the supply in the catchment area.

The methods that are usually adopted for maintaining the saturation of the catchment would include mulching and such other methods that cut the capillary connection with the lower layers. Putting on sand layers, vegetation or artificial mulches will have to be adopted to maintain the saturation achieved by the methods of saturating the area.

The last is tapping these sources at the proper place and getting the water for human or crop consumption.

A brief mention of these methods at the end of this discussion may help to understand this subject. This has, as stated above, assumed a shape of regular business for some and as such deserves mention. Amongst the earliest scientific efforts done in this direction are done by Saraswat and Manawa-acharyas about 2000 years ago. The conclusions drawn by these two eminent Oriental Scientists have been based on the observation of plant and animal life as well as Geological situations. These have been collected and systematised by Warahmihira-charya who lived it is stated about 1500 years ago, and they have been put in the form of verses. This study seems to be very systematic and considering the several plants mentioned, one must conclude that there must be certain truth in the conclusions. To explain fully the statements of Warahmihira-charya would be the subject matter for a separate article.

Another method is that of Astrology. They have their own method of concluding from the Lagna at the time of inquiry as also of the place where the well is to be dug. This is all done with reference to the owner's horoscope and it is stated that the conclusions are correct. This class makes use of the

above stated conclusions of Warahamihiracharya. They cannot, however make the needful scientific adjustments.

The next class is that of Diviners. They claim to have some physical powers. Some believe that they are psychic, some feel, some hear, great shocks and so on. This however is a personal factor and has no unit by which this capacity could be measured. There is neither positive nor negative proof to say anything about the existance of such powers.

The Geologist tries to study this question from a more reasonable point of view. He studies the factors by which water would percolate in the catchment and with the help of systmatic study tries to find out the approximate place of the underground flow. If the Geologist uses the instruments designed to find water at this approximate location he meets with success. This has been the writer's personal experience during the last ten years. This again in itself is a subject matter for another article. Experience shows that the Geologist using this machine is able to say more definitely about the existance of the current together with the quantity available.

While considering the question of water supply in the Villages therefore it would be essential to make a survey of the catchment of the area; the total rainfall that is available, the methods by which maximum saturation would be available and maintained, the methods for locating the place which would give the maximum yield, fixing the method to obtain the same (as by cutting foliage in the Konkan) and finally by tapping the same economically.

This would help to get the best results in case of water-supply in the Villages whether for human or crop consumption.

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## ECONOMICS OF THE BULLOCK.



During the recent developments in Agriculture many attempts have been directed towards getting fast work and effecting economy in the cost of cultivation. In these efforts are included the tractors and such other machinery. Many types of ploughs and harrows have been put out which are being worked by oil power. Some advantages such as non-dependence etc. are claimed for using this power. It is also claimed that the actual expenditure on particular items in money is less. In all these introductions, assuming that they are made in every case, the chief aim is to displace the bullock power that is at present utilised for this purpose. It is proposed in this article to try to put up the economy that is made by utilising the bullock power as against oil power.

This is not an attempt to write against advancement or introductions if they are done rightly with scientific background, and with regard to national economy. In many cases the present day introduction have been the result of the promptings of selfish or ignorant individuals. If it was a result of scientific research by disinterested brains then there would have been no occasion to plead for the bullock.

The bullock, as a class, is at present useful for manifold purposes and has a very prominent place in agricultural life. It is at present useful for slow and fast draught required on the farm, for the cart traffic on *Kahca* as well as metal roads, for lifting water from wells and for manure. It will thus be seen that this animal is useful to the cultivator practically in every place and farm operation where the cultivator needs help.

Amongst all, two are very important from the point of agriculture. They are all kinds of draught and manure. None of the machines are capable of satisfying these two. This animal is useful at all places whether hilly or otherwise and can walk up and down the hills. Such is not the case with the petrol or oil driven motive power. The same animal can work a Plough a Mot, a Cart and bring even firewood from hills. Howsoever small an engine might be, it cannot be used for such a variety of purposes. The second point that may draw the attention is that the engine cannot be over worked if required at times. An animal can put in at times one and half times its normal work if needed on some occasion of urgency.

Besides this, the machine cannot under any conditions give manure which the bullock gives and which is an essential factor in Indian Agriculture. India is a sub-tropical part and the temperatures vary and go up to 118° F. in certain parts. Much of the organic contents of the soil are affected by this heat and many times replacing the organic matter in the soil determines the quantity of crop that could be obtained from the soil. The organic matter is a very highly important factor in Indian agriculture. This has got the capacity to supply the nitrogen necessary for the growth of the plant and also improve the porosity of the soil which helps to increase the moisture content of the soil as well as proper aeration. These three factors go to determine plant growth. No amount of concentrated manure would help if the porosity of the soil and consequently aeration of the soil is not improved. Under Indian conditions therefore the Farm Yard manure is a very important factor in agriculture and the returns may be said to vary directly according to the quantity of this type of manure. It is evident that no machine can give this type of manure.

Some attempt at green manuring by Tag and allied Leguminous plants has been proposed by the department of Agriculture.

There is nothing available to say against this type of manure so far as it is considered as a bulky manure but this alone does not suffice for its introduction. If one were to consider the cost of this manure it will be found that it will not be economic. In the first instance it occupies the soil for one Kharif crop period from the time of planting till it is sufficiently decayed. Secondly this cannot be fed to animals. The cost of production is as much as that of Nilwa. Suppose we were to grow Nilwa instead of Tag on the same piece of land, the result would be that in the same period we would get fodder enough for two animals. These very animals will work for the owner for the whole of the year and at the end of the year return the same Nilwa in the form of manure, in a suitable form to be put in the field, probably with some addition of Nitrogen from metabolic processes of the body.

Most of the Nitrogen taken from the soil will be returned in the feces as a working animal utilises only the carbohydrates for work purposes from the food given to him. These carbohydrates are no good as a manure as most of the carbohydrate material in the crop is fixed from the atmosphere during the process of metabolism in the plants. Thus the animal utilises that energy which is a waste, in case of Tag, when buried to produce work. Thus during the same period during which a piece of land is occupied, if a fodder is grown, it produces energy through the bullock medium. It is thus clear that if the land is occupied for a particular period by Tag, as against a fodder crop the returns obtained are more than what could be obtained by Tag.

Besides the manure obtained through the bullock medium is more available to the plant than the one obtainable by Tag as (the farm yard manure) it has once passed through organic system and has been acted upon by decomposing agents and organisms. This discussion will make it clear as to why no amount

of machinery can displace the organic manure yielded by passing through the organic system. Some synthetic type of manure was prepared at Indore and Pusa institutes by different methods as spreading it on ground, heaping and treating it with salt and by using starters. None of these have however become common and do not seem to have been adopted on even a small scale. If the question is carefully considered it may not be difficult to understand that the bullock is the best factory for the production of cheap and best farm yard manure which is absolutely essential for best returns in terms of crops from the soil. The bullock while working as a manufacturing centre for Farm Yard manure gives work by utilising the Carbohydrates in the crop which (Carbohydrate) are wasted in case of green manuring. It could therefore be concluded with relevancy that this is unique in case of the bullock and nothing can displace him.

Turning to the other points one can see that this animal is capable of giving fast as well as slow work and the same pair could be used from ploughing to crushing the earheads and carting the grain to the market. All this the animal can do only for the straw that is left out after taking all grain and the cake, that remains after the oil from the oil seeds is extracted, for human consumption. This oil again is extracted by the same animal. No amount of machinery can do so varied duties. The investment that the owner has got to make for the sake of this machinery (bullock) varies from 200 to 400 Rs. according as his work is heavy or light. As against this, let us consider the other investment that he may be required to make. He must have an oil-engine, a moter car and a tractor and small motor-driven harrows and such other implements. The minimum investment that he may be required to do in this, will not be less than ten times as much. Besides these he will require fuel in the form of oil etc. which not only cannot be produced on his farm but not even in the country.

The bullock therefore is not a factor which can suffer displacement so far as the *present conditions of agriculture* are

available. It would be interesting to note how this live machine ( bullock ) is being kept busy all the year round and these businesses are being chiefly subsidiary occupations to the cultivators. The main agricultural operations are, ploughing, harrowing, sowing and interculturing. For all this the same animals are used who give quite faithful work with efficiency. During year each acre engages these animals for about a week in case of a dry crop. The limiting factor is the sowing season, each pair usually manages an area upto 20 acres at the most but this is rare and usually it may be taken for granted that they manage about 10 acres. This means that the animals have got enough work for about 3 to 4 months in the year. The rest of the time they have to be utilised. In case of the machinery it must remain idle during this period. The animal can do useful work if it is used for carting ( which includes passenger traffic as well as goods traffic ), crushing oil-seeds, crushing the grain etc. This work cannot be expected from machinery. If carting alone is considered it will be evident that the cultivator can save a lot in this alone. Usually when he carried his goods to the market in his bullock-cart he has to spend practically nothing except a little labour. He has to feed his bullocks even if he keeps them idle.

If on the other hand he carried his goods in a motor he has to spend a lot of time waiting for the bus which is not a certainty and has got to stay over at the place of the market where again he is induced to spend due to several attractions. This could be very well understood if one only sees the Poona market and the surrounding Cinemas. He is required in addition to pay the bus owner and probably spends a Rupee and over in this transaction. If he had travelled in his cart he would not have been required to pay this amount.

It is evident from observation of the present day cultivator that he has ample time on hand and that he has nothing better

to do in the time that he saves by spending for a motor. In this case he spends for the bus and feeds the bullock. If it has to pay him to do this he has to earn enough to spend for the bus and feed the bullock. If he cannot do so then it is waste of energy to go in the bus. The present experience shows that he does not earn at all and utilises his time in picking up quarrels. There is thus no advantage from this introduction. Next to carting comes the oil crushing industry. This also was worked by this very animal. The same story as for carting applies to this case also.

It may be argued that the oil mill extracts the oil in a very short time and the comparative return in figures is less. True, but what are these figures? They are only indications. They do not consider as to what would happen if that bullock is left without that work. The figure then appears on the debit side of the cultivator who credits nothing to counter balance that debit. The balance is therefore minus when he looks into his balance sheet. The responsibility of finding suitable credit lies with him who proposes the debit. If a proper credit suitable to this whole system is suggested then a counter balancing debit could be tolerated. But a debit without a credit cannot and should not be accepted.

If all these facts are considered one can easily understand that it can never be cheap to replace the bullock power by motive power. One can easily show by figures that the machinery costs less but ultimately one can see his way to agree to what has been said above. It may be possible to quote a singular example of a farmer owning hundreds of acres and growing a single money crop, but such farmers are only exceptions at present. This discussion is not meant for exceptions as it is meant for the ordinary small cultivator who is common in the land.

There is another factor that has also to be considered and that is of the milk that is supplied by the cow. This is supposed to be primarily a dual purpose animal, this will be clear if one

only turns the pages of the history of Indian Agriculture. The cow that gives the bullock supplies this milk. It is not possible to discard this milk factor. When one wants both milk and useful work, one has necessarily to turn to the cow. No existing animal is as useful as the cow class. The milk capacity that is found in the cow is transmitted through the male as breeders tell us. If this capacity is to be developed then the bull to be used for breeding purposes must be a selected one. There must therefore be a good scope for selection. In order that this scope may be available all male calves that are born have to be reared, which means cost. If they are reared only for selection then it will be costly and the whole cost will be debited to the milk account. The milk of the cow is peculiar but this is not the place to enter into the utility of the milk of the cow. The cow has a special capacity of assimilating carotene and zanthoxyl which is available in the milk and is useful to sharpen the brain etc.

The above discussion may make it clear that at least for the present and till an overhauling agricultural programme is planned the bullock is the fundamental factor in Agriculture, and success in Agriculture will depend on keeping this basic factor busy all the year round which means carting, oil crushing etc. If these occupations are not reserved for the bullock he will be a burden on the small holding and after some time the holding will not be in a position to give livelihood to this animal and cultivator and as a result the returns from the land will fall as they have in certain cases. Some facts of personal experience and observation though relevant cannot be quoted for want of space. This will show why the motor bus and the oil ghani and others are unwelcome. Machinery has to be introduced when the existing appliances are fully occupied. At present the existing appliances are not fully utilised and as such there is no place for the introduction of machinery.

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## EXPERIMENTS WITH FRUIT JUICES.



During the last twenty years fruit plantations in the Deccan are increasing year by year. The consuming capacity of the public is not however keeping pace with the increase in production. The natural bearing time of these plantations is somewhere between June and December, which happens to be the rainy part of the year in the Deccan. The maximum quantity comes to the market during this season and that too is flooded in fifteen or twenty days period. It is during this period that the cultivator has to sell his fruit dirt cheap. In certain cases the cultivator is not able to send his fruit up to the market place in which case they go to waste assuming that they reach the market and are sold cheap even then they are not put to proper use, and much of it is wasted. It is the object of this attempt to utilise this excess, or waste as the case may be, usefully.

Fruit plantations are increasing near and far from the city. Much of the fruit that does not stand keeping is grown near the city such as Figs, Guavas, Papay etc. Other fruit that can stand transport such as Lemons, Mosambees, Pomegranates and others are grown at a distance. The plantations are adjusted to the transport facilities.

When the product reaches the market it is in the hands of the middleman. He is the man who controls the price. This is adjusted to suit the retailer (in the first instance) and the total quantity of the particular commodity in the market. The owner has practically no choice in all this transaction. The commodity is perishable. He (the owner) is an outsider. He (being an



outsider) has no shelter to hold on his goods even for a day or two. Being thus hampered he has to accept whatever price is offered to him. He has to pay for the transport and also the octroi. These are charged on weight and not on the proceeds. This is thus a constant factor and does not vary even if the prices fall. On certain occasions about 10 annas in the Rupee are spent on transport and octroi and six annas go to the producer. The jugglery of the middleman is not accounted for in the above figures. Under these circumstances one has to find out how proper prices could be realised for the commodities that cannot be stocked. One of the solutions could be to prepare such products from this fruit as will last for a longer time than the fruit itself. If this could be done then enhanced prices could be realised for the excess of fruit. Amongst these could be included fruit products like Juices, Syrups, Jellies etc. These products are being imported on a large scale at present and find a market. The prices that are realised for the imported goods are comparatively high. If the price for the ingredients of these products is considered it seems possible to make some money by manufacturing these products and consequently get better prices for the raw materials that go to waste, or are produced in excess. It will have to be admitted that these products when produced on a large scale flood the market but it will also increase the demand. Taking into consideration the above points it was found desirable to make attempts in this direction. During the last 18 months these attempts were made on Jambul, Lemon, Mosambees, Pomegranates and Santra. Attempts were primarily directed at preserving the juices. Out of these it was found that the first four could be preserved alright. Some difficulty arises about Santra which needs some more experiments before it is achieved.

This manufacturing has mainly to be done at the place of production and not at the market place which is usually in the city. Thus the mosambee juice will be bottled

<b>Field of</b>	in the mosambee garden. This will save trans-
<b>Work</b>	port, octroi and the middleman's charges.

Besides, it will do away with the dependence on the middleman for immediate sale. The commodity which costs in the city market one rupee will cost at the place of production annas six only. Besides this the packing etc. may also be considered. It would thus be a best effort for the producer to do. This would give him the proper price for his commodity and his agriculture will not be a losing concern.

During this manufacture larger quantities will have to be manipulated. For this some appliances will be necessary.

Certain considerations will have to be made

**Machinery** while using this machinery. The first and foremost is the power required for the machinery. Considering the Deccan one can easily see that coal and oil power are not indigenous and as such will necessarily be costly to use as sources of power. Electricity could be generated on a large scale but the appliances for the transmission etc. are not indigenous and create a stumbling block. Besides so much human power is being idled away that it is almost criminal. In the villages, specially, this human power is available to a great extent and could be used with benefit. Amongst the natural resources water-currents and winds could also be utilised but it cannot be a general and constant source of power. Thus ultimately the only easily available powers are human and animal power. The machinery to be used, therefore, must be workable by human or animal power. The machinery required for this manufacture has been designed with this view. It includes the Crown Capping Machine, a Press and Essential oil apparatus.

The next point that needs consideration is the skill that is required to manufacture the machine and also to work the machine. If the machinery could not be designed by the skill locally available, it would be difficult to make repairs and the producer will have to wait for every small part. He will have to

pay whatever price is charged for the part which leaves a loop hole in his manufacture. It would thus be beneficial to depend on the skill available. The second part is the skill of the individual who is to use the machine. A very delicate machine in the hands of a rustic would be spoiled in no time. Thus the machinery that is used should be such as could be manufactured with local skill and should be sufficiently strong so that it could be used by the cultivator. The above three appliances were manufactured with the above limitations. They can be manipulated by one man.

The next important point is the number of workers employed during manufacture. This business extends over, at the most, about 4 months time in the year. The number of workers available in the locality where it is suggested that this work should be done is also likely to be limited. With this view, in the preliminary stages of this work, the number of workers is limited to four as it is usually found that a normal family consists of four. The working number was thus limited to four during the attempt.

The next question is that of the space required for manufacture, as well a built up place would be required, for this purpose and which is usually limited in the villages. The total enclosed space was therefore limited to 15' x 20'.

During the last season and this season work was done under these limitations of appliances, labour and space. In order to make it a thoroughly home industry this work was done with the help of the members of the family of the writer himself. The experiments were done with Jambul, and Lemon during the last season and Jambul, Lemon, Mossambee, Pomegranates and Santra this year. The bitterness from the Lemon Juice has been

completely avoided by adjustment in the process of manufactures. The Lemon Juice thus stands one point higher than the Lemon Juice in the market. Jambul Juice is not much in the market. The color of this is as it was when raw and thus it can be concluded that no better quality can be prepared. These Juices have secured a First Class Certificate (Eligible for gold medal on payment of Rs. 30) in the Industrial Exhibition held in Poona.

One important point that has to be remembered during this manufacture is that every waste has to be avoided in manufacture and maximum number of useful products have to be prepared. If this is not done the working cost is charged only on one product and it leaves less margin. If the above precautions are taken much saving could be done. Information about Lemon products is given below as an example.

(The figures given below are approximate and may not be taken as very accurate.)

About 1000 lbs. of Lemons were used in this manufacture. The Juice was extracted in such a way as to avoid the essential oil contained in the outer peel. This does not **Experiments** allow any of the essential oil to get in the Juice. **with Lemons** This was experimented upon and it was found that this oil could be taken out. A simple apparatus was designed and about 10 ozs. of essential oil was extracted from the above Lemons. The Juice obtained was about 525 lbs. and was about 450 to 475 lbs. by measure. The clarified Juice measured about 500 lbs. by weight. The Juice was not allowed to come in contact with metals like iron during extraction. This Juice has to be kept for some time for clarification and after it is settled the supernatant Juice decanted and bottled, pasteurised and capped. The Juice thus prepared lasts for about two weeks even after opening the bottle. One more product could be prepared out of the material

that remains after extraction. It makes fine Chutney if salt chillies etc. are mixed with it in the preparation. Thus in this manufacture from Lemon :—

- (1) Lemon Juice.
- (2) Essential Oil and
- (3) Lemon Chutney.

could be prepared which left no waste.

The capital required to manipulate 100 lbs. of Lemons would vary according to circumstances. But one statement can be very safely made and that is that this would give the cultivator more returns than he would get if he sells the fruit as such. It would be premature to give figures at this stage of experiment as the prices that are likely to be realised for commodities are not as yet settled as also the extent of total sales. To know the extent of the demand is one of the points of study in this experiment which may incur a total expenditure of about 5000 Rupees. This would give a definite indication as to the success or otherwise of the experiment. In this estimate no calculation has been made for the energy and time spend over this experiment. The results have therefore to be awaited till this capital could be invested by the writer.

The points of consideration in this manufacture are :—

- (1) The number of workers employed
- (2) The space required for work.
- (3) The skill of the workers.
- (4) The appliances utilised.
- (5) The extent of demand.
- (6) The capital required.
- (7) The materials and skill available.

## RURAL RECONSTRUCTION KHED-SHIVAPUR.\*

( Extract from the Original Article )



There have been quite a number of attempts in the direction of the solution of the problem of village improvement. Quite a number of able workers have started them and stopped work for one reason or another. These workers have done great service to those who would further make an endeavour at tackling the same problem. They have made other workers in the line aware of the difficulties and the appalling condition of the village and have brought to the forefront the degeneration that exists in rural areas in quite a number of ways. They have also shown that there does not exist the same condition as in times gone by.

Let us, therefore turn to the olden times and look at them from the viewpoint of the life that was then led. In those times, it seems, people were happy and strong mentally as well as physically, the mental strength they possessed was derived by them from a strong mind full of faith in God and man and their own physical strength to do the needful. The body was strong and could bear the strain of doing all the agricultural or industrial work that was essential to maintain them without much trouble. This strength was derived from wholesome food, clean habits, healthy climate, and sufficient employment for the body.

These good old days of the Hindoos, it seems, were disturbed since the Mahomedan invasions; people began to be unhappy and somewhat shaken in faith probably due to the preachings of Mahomedan priests in contradiction to their own faith, namely,

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\*This is a village about 17 miles on the Poona-Mahabaleshwar Road. The Head-quarters are in the interior on Khed-Shivapur Road, 1½ miles away from the Poona-Mahabaleshwar Road.

Hinduism and to the intolerent attitude of the rulers which produced a diseased mentality. In the 17th century we find the mind much diseased and also the body. The invaders looted, plundered and produced unbalanced conditions and destroyed the old machinery of the village. Later on some good Mahomedan rulers introduced certain good features in administration and somehow carried on the Government of the country without much minding the welfare of the subjects. During the last two hundred years the economic life of the people has been upset by the constant drain to other countries of the grain and other raw products of the nation. During the Mahomedan period only an additional population had to be fed; but during this period not only an additional burden—in addition to the Mahomedans—had to be borne by the land but due to export and the policy of so-called free trade much of the food material was exported without increased production. The cultivator has practically nothing with him except an unsound and unformed mind and a half-starved body which is chiefly the result of the process of unscrupulous hoarding and callous mentality of the moneyed class. He remains scorned and hated, and is an object of exploitation. He is ignorant and has not even enough food to eat. He tries to get money by running to places like Bombay and other business centres and returns poorer in body and deeply sunk in vices; thus he experiences life in a much worse condition than he had seen before. Hope which is the greatest solace in life prompts him on and he again goes to a mill area and again returns poorer. This process is repeated every year like the weathering process of nature. Every year there is heat which is followed by rain which washes off the disintegrated portions and lays bare the rocks; again, heat returns and with it the disintegration processes. In this way the villager is reduced mentally as well as physically year after year and ultimately he crumbles down and succumbs to circumstances. This is, in short, the condition of the present villager. Thus, he has no other solace in life except keeping body and soul together.

Many people say he has himself brought on this condition. It would be more correct to say that he is reduced to this plight, by the better brained people. It would, therefore, be the duty of the same better brained people who fed on the ignorance of this villager to repay their hoardings, intellectual as well as monetary. It would be but fair for them to turn attention to this villager and spend their time and talents in making the villager more healthy in mind and body.

Let us now turn to find out the essentials for enabling the villager to start on the battle of life with a sound body and a sound mind. To put it in a nutshell, he must be given that education which consists of the four R's. This fourth R. has been added by Pandit Madan Mohan Malaviya, in his presidential address at the Rural Uplift Conference held in Poona at the Seva Sadan, in June 1931. This fourth R. is Religion. It is faith in the Almighty. A faithful mind, wherever it goes, is sure to triumph in every good cause.

Faith is a necessary factor of mind which is found to be helpful in being happy and prosperous in a large number of cases. Hope is another factor. Hope guides every man all through life. If a man is never ready to protect himself he would never train himself with Lathi and other devices meant to protect oneself. With protection follows producing enough for oneself and the dependants. For this good health is essential with which follows sanitation, which means good clean houses and pure drinking water supply.

Thus, any centre that provides for the several aspects mentioned above might well be called a Rural Uplift Centre. The above-mentioned is only the social part of it. There are other sides also such as co-operation in purchasing together for the whole town, improvement for the seed supply and quite a number of other forms of economic activity.



Let us now turn to the conditions that existed at Khed-Shivapur two years ago when the Rural Uplift work was taken up. This was the old mango garden area of the Moghul rulers containing a fairly large number of mango trees many of the varieties being famous for certain peculiarities. There is good traffic in mangoes for the last two hundred years and over. Most of the area is commanded by good well irrigation. The soils are black and loamy ones and give good yield of crops. The rainfall is about 35 inches annually and is well distributed over  $4\frac{1}{2}$  to 5 months. There are three Nalas which have small bunds at intervals and have been partially developed. There is also a grazing area which may supply enough and more fodder for the cattle. The well waters are not brackish and consequently the soils do not go bad even after years of irrigation. The weather even in the hot season does not record a high temperature. There are no frosts and such other accidental factors that damage the crop year after year.

Despite all these helpful factors including the ready money which the mango crop brings at least every alternate year, the cultivator is in debt and has all the common defects or drawbacks mentioned at the beginning. It was through the talks about the condition of the village with the Deputy Director of Agriculture that Mr. G. K. Devadhar came in touch with this group of villages and visited this place several times with his friends and colleagues. It is customary with Mr. G. K. Devadhar to employ all possible energies and to do his utmost in working for the solution of a problem he takes in hand, So also with this idea about Khed-shivapur. Being the President of the Servants of India Society, he at once asked one of the probationers in the society Mr. K. G. Sharangpani, to interest himself in the rural uplift work, at Khed-Shivapur. Simultaneously with this, Mr. Devadhar could secure the active help of Miss Dwarkabhi Bhat, the Superintendent of the Poona Seva Sadan Society's Training College for Women, as he needed some

intelligent women to undertake classes for adult women and girls. Then came Mr. S. L. Apte's turn to go and work there in the field of Co-operation and to co-ordinate the economic links of the villages. Mr. Devadhar is now for the last three years the Chairman of the Executive Committee of the Deccan Agricultural Association, a body which was lying in a dormant condition and which Mr. Devadhar had the credit of reviving. Mr. Devadhar prevailed upon the Committee to put all this work in the hands of the Deccan Agricultural Association. Mr. Devdhar got quite a number of sets of magic lantern slides prepared on subjects of rural importance such as village sanitation, health and hygiene, sugarcane, rice, co-operation, education and others and arranged to exhibit them. The voluntary services of certain individuals also were forthcoming. Last but not the least were the Agricultural, Co-operative, Public Health and Veterinary Departments from which Mr. G. K. Devadhar could claim as much help in a friendly way as was possible and available.

The work at the Khed-Shivapur center is being conducted under the auspices of the Deccan Agricultural Association, with Mr. G. K. Devadhar at its head and with the active co-operation of many voluntary agencies with somewhat allied aims. Moreover, in order that the work of this Rural Center may be facilitated, the Deccan Agricultural Association has appointed three sub Committees, in addition to the Executive Committee.

These four committees are composed of members who have some specific knowledge of the subject. They go a great way in helping the smooth working of the centre. If any work has to be done at the centre, for example, a poultry farm, it has to be guided and conducted by the rural uplift sub-committee and has got to be supervised by the same. All such activities therefore agricultural improvement, schools, secondary occupations, water-supply and the like have to be done and supervised by the rural

uplift sub-committee. Miss. Dwarkabai Bhat, is this year the Secretary of this sub-committee. She goes to Khed-Shivapur every Saturday and Sunday and looks after the work of the schools and classes.

The local advisory committee meets often or at least once a month and is a sort of guide to the work, that the workers undertake. The advisory committee is of great use in giving the facts about the place and the likes and dislikes of the people. It is helpful in inducing the cultivators to adopt new ways and methods and explaining to them in suitable language the proposals that the members of the different committee make. It is also of great help when meetings and gatherings are to be organised. People in the villages around the center feel that the work is being conducted with the advice of their own men and feel inclined to avail themselves of it. Thus, this committee is of great value in helping the several committees to take up such work as would only be accepted by the people without any hitch.

The propaganda sub-committee is expected to carry on publicity work for the center and activities of the Deccan Agricultural Association and create outside sympathy with the same. It is also expected to collect information from other centres of rural uplift work and deliver lectures with a view to popularizing the various activities of the Deccan Agricultural Association and its newly undertaken special activity. The committee is also expected to tour and spread information about the various phases of such work in other tracts.

( *Written in 1931* )