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Walchandnagar—An Agri-Industrial Enterprise

By K. C. RAMAKRISHNAN

The Founder. Walchandnagar is a veritable wonderland created by Seth Hirachand Walchand from out of what was virtually a wilderness ten years back. A magnificent estate comprising 17,000 acres has been built up round about the old village Kalamb in the Sholapur district of the Bombay Presidency by this inspired millionaire, Walchand, who is better known as a shipping magnate, the builder of the Hindusthan Aircraft Factory, and the manager of the Hume Pipe Co. The latest enterprise of his is in the field of radio engineering. That such a multi-sided industrialist should take to the development of agriculture on the scale noted below would come as an agreeable surprise to most of our readers.

Soil, climate and irrigation. The soil round about Kalamb is shallow and unretentive, though of the black cotton variety. The rainfall is only 21 inches per year and the native population, exhausted by the perpetual struggle for existence, had not the energy and material resources to utilise the irrigation facilities provided from the Nira river by the Government, and went on growing poor crops, raising sugarcane and making *gur* only to the extent of Rs. 20,000 per year, while at present refined sugar is manufactured to the tune of Rs. 20 lakhs in the year. Reclamation of land and rendering it fit to receive flow irrigation required Rs. 1 lakh. Drainage had to be constructed for a length of 16 miles—4 miles of it underground—to deal with the excessive moisture and correct alkalinity, a problem in all such irrigated tracts.

On behalf of Marsland Price Co. of which he is the Managing Agent, Mr. Walchand plunged into the business of sugarcane plantation on a large scale and its manufacture into refined sugar on the spot, which is necessary in the case of such a highly bulky and perishable produce as sugarcane. The immediate inspiration was the levy of heavy protective duties by the Indian legislature on sugar imported into India, guaranteed for 15 years from 1932.

Land bought and leased. He went on purchasing land at less than Rs 100 per acre from the ryots in the period of Depression ; and at present the Company owns 3,500 acres. The rest of the land, 13,000 acres, has been leased at rates varying from Rs 7 to Rs 10 per acre for the long period of 30 years. More difficulty is now felt in the purchase of ryots' lands. The Company does not wish to exercise any coercion in purchase, but by methods of persuasion acquire or lease intervening plots which not only impede construction of irrigation and drainage channels but breed pests ; and the ill-constructed and ill-kept houses are sources of epidemics that affect the population of the estate.

Power-pumping. Not content with flow irrigation from river channels the Company has recently put up a pumping plant with a 100 H. P. engine (manufactured, be it noted, by the Cooper Engineering Co., of Satara) for lifting water from the river Nira direct to the land 50 feet above.

Sugarcane Cultivation. Sugarcane is the main crop in the estate and covers at any time about 3,500 acres and the harvest lasts for about 200 days in the year, a great achievement considering the limitations of climate in the tract. After the first planted cane is cut in about 15 months or so after planting, one ratoon crop is allowed to grow, which saves a lot of labour, though there is no stinting of manure for the ratoon. The two chief varieties of cane grown in Walchandnagar are Co. 419 which is the heaviest yielder and P. O. J. 2878 which is preferred by the sugar chemist for its sucrose content. Fifty per cent of the area is planted in July and harvested in 15 to 18 months after ; ten per cent is planted in November and forty per cent is ratoon crop.

The preparatory cultivation—ploughing, breaking clods, harrowing and ridging—is all done by ten 80 H. P. tractors. Human labour is employed for weeding, earthing-up, manuring and harvesting. About 1,000 acres of cane are green manured by sunnhemp which is ploughed in by disc ploughs. About 800 tons of farm yard manure are available on the estate, which is applied to about 200 acres. In pre-war days when sulphate of ammonia was available, it was applied at the rate of 4 cwt. per acre along with groundnut cake— $1\frac{1}{2}$ tons per acre. Now practically no sulphate of ammonia is applied as it has become very costly ; but instead, as much as 3 tons of groundnut cake are applied per acre of planted canes and two tons per acre of ratoons. Groundnut cake too has to be purchased at over Rs. 100 per ton, which is over 200 per cent of pre-war price.

Irrigation dues to the Government amount to Rs. 70 per acre for the whole crop, which is more than double the average rate in the ryotwari areas of the Madras Presidency, irrigated by Government works. Application of water to the land costs about Rs. 25 per acre, and harvesting and carting of canes to the light railway line—done on piece wage system—costs Rs. 45 per acre. Altogether, the cost of cultivation and harvesting amounts to Rs. 520 per acre which works out to Rs. 12 per ton of cane.

Other crops—Though Walchandnagar is essentially a sugarcane plantation, food grains particularly *jowar* (cholam), *bajra* (cumbu) and wheat—are also grown on about 2,000 acres per year. The two millets are supplied to the labourers in the estate. A recent development is that of growing vegetables—European as well as Indian—on a large scale. A present 600 acres are devoted to them. The yield is more than sufficient for consumption by the 1,500 families in the estate; the surplus is sold to the Military. The less lasting vegetables are dehydrated and preserved on a small scale at present; but it is to be done on a larger scale very soon. Manure is not applied to all the vegetables, as the residual effect of the lavish use of manure for sugarcane is enough to raise some splendid vegetable crops. The sweet potatoes, for instance, raised on such fields are uncommonly big in size, though they are not quite so sweet as the smaller ones we grow here.

We wonder why cotton and groundnut are not grown in the black cotton soil and groundnut kernels are imported in large quantities for the oil factory. It is a pity we had little time at our disposal for a more detailed enquiry, though the management and the staff were courteous and ready to oblige us with information.

The Dairy. Another noteworthy agricultural development in Walchandnagar is the Dairy with a milch herd of 350, of which 322 are she-buffaloes of the Murrah breed and 28 are cows. There are 330 calves, 8 stud buffaloes and 3 stud bulls. The cattle sheds are well built and kept clean, but appear to be somewhat overcrowded. The yield of milk is rather poor for the herd as a whole. It is about 1,500 lb. a day. It is estimated that, on an average, only 50 per cent of the milch herd are actually in milk and thus the average yield of an animal is only 8½ lb. per day—which is much below the average for the Murrah breed. The aim of the management is to increase the milch herd to 1,000 animals if provision for fodder could be made. The sugarcane tops provide some fodder for cattle and the cattle provide some manure for the sugarcane; but though mutually helpful neither is sufficient for the other. All the milk produced is pasteurised by a modern plant with a capacity of 1,100 lb. of milk per hour. But the milk now available is only 1,500 lb. per day. It is stated that the quantity of milk is not all consumed in the estate though there are 1,500 families there and that the surplus of pasteurised milk is sent daily by motor lorry and rail to the big consuming markets of Poona and Bombay. The standard of living of the masses of population in the estate must be low, or there must be other sources of supply of milk to them—of which we were not informed.

Co-ordination of Agriculture and industry. The greatest claim made for Walchandnagar as a unique enterprise is that a number of industries have been built up in an agricultural and rural environment away from the din and bustle and the slum and dirt of urban areas, where generally

factories have been so far built, to the detriment both of capital and labour. It is the aim of Mr. Walchand to combine and co-ordinate agriculture and industry "so as to increase production from lands and to utilise to the utmost the products therefrom providing employment for the largest number".

Sugar industry, the pivot The sugar industry is the best instance of such co-ordination. In the case of sugar it is not only desirable but necessary to have the factory in the midst or in the neighbourhood of canes as the latter are bulky (recovery of sugar being only 11 per cent at the most on the weight of canes) and perishable. The delay in the crushing of canes and boiling of juice causes rapid deterioration in the recovery of sugar. A 15 miles radius of canes round about the factory is the maximum distance manageable in India. The sugar factory in Walchandnagar is the pivot, so to say, on which everything in the estate revolves. Production of sugar is the central aim and the canes are grown to feed the factory. It started 10 years back with a crushing capacity of 150 tons of canes per day. Now it crushes 1,200 tons per day for 180 to 200 days in the year and 120 tons (1,200 bags) of sugar are bagged per day on an average. The crystals of sugar produced are bigger in size than we are used to here in South India and they are in great demand in the Bombay market.

The Distillery. The development of industries based on the by-products of sugar industry is another pet ambition of Mr. Walchand, which has been partly realised and will be pursued further, conditions favouring. The utilisation of molasses (formerly thrown away at some cost as a nuisance) in the distillery put up recently, with machinery, designed and manufactured in Bombay, is another great achievement. After a good deal of negotiations with the Government, the necessary permission was obtained to manufacture rectified spirit from out of molasses on condition that 60 percent of the product was supplied to the Government for war purposes, and only 40 percent was sold to the public for industrial purposes. The daily output of rectified spirit is 1,500 gallons of 97 percent purity. Fusel oil is a by-product obtained in distillation and it is all supplied to the Government for war purposes. It is proposed to recover, in course of time, butyl alcohol, amyl alcohol, butyl acetate, amyl acetate, etc. The company has started producing yeast which will be used as cattlefood and is trying to utilise even the spent wash of the distillery for irrigating and manuring fields and to recover potash and other manurial salts from the same. In fact the chemists of the sugar factory are kept engaged in the three or four months of the off season in such experiments in the laboratory.

The Oil Factory. The oil factory which was set up in 1939, and has at present seven expellers, crushes groundnut kernels which are not produced locally but imported, makes oil and oil-cakes which are very much needed as manure for sugarcane. At least 10,000 tons of cake are needed per year, but only a third of it is produced on account of the difficulty of getting kernels by the railway. An oil refinery and hydrogenation plant have been

installed in 1941 for the production of refined oil and vegetable ghee which would satisfy the Bombay market. This plant is said to be the first of its kind designed and manufactured by Indians in India. The 'ghee' is expected to be put in the market very soon. The soap-stock after refining the oil is used in the manufacture of washing soaps, for washing glass, machinery, floor, etc. Glycerine is not recovered at present. Nor yet is any toilet soap made. An important requisite in soap making is caustic soda, which is prepared in the factory itself on a small scale and will be attempted on a larger scale by the electrolytic process later.

Scope for Paper and other by-industries. Experiments are being carried on for making wrapping paper and card-boards from sugarcane trash and stalks of cane flowers and ordinary paper from begasse and old gunny bags. A plant may soon be put up with a capacity of 2 to 3 tons of paper per day. Boot polish is sought to be made by using hydrogenated fat, cane wax etc. Brushes are already made from the hair of dairy animals. Dehydration of vegetables, which is done on a small scale at present, is to be developed. Various types of preserving vegetables and fruits are under experiment, e. g., tomato juice and *chutnies*.

A vast vista of by-industries which would utilise the by-products and engage unemployed or under-employed labour seems thus possible. But all of them put together may not employ any considerable number. Some of them are, perhaps, better carried on as home industries on a small scale rather than in factories where over-head costs are bound to tell, especially if competition from foreign countries is again given free scope.

Localisation of Industries. It is, again, a common mistake to assume that any raw material can be manufactured into a finished product if only it is found in abundance, irrespective of other essential requisites for building up an industry, viz, other raw materials, power, capital, labour, market and capacity for organisation. Confining our attention to raw materials alone, the law as regards localisation of industries in relation to them is worth noting, though this is not the place to elucidate and illustrate the same. "Raw materials tend to attract industries to their place of production in inverse proportion to the amount of the raw material that enters into the final product".

Judged by this test, the strongest case is for locating a sugar factory near sugarcane plantations, as sugarcane is a bulky and highly perishable stuff and there is a lot of refuse - the begasse - which does not enter into the final product. The case is equally strong for locating a distillery near a sugar factory where the waste product - molasses - is the base for rectified spirit etc. The case is weaker for locating an oil factory near groundnut production. It is still weaker for paper, for which power is more important. It is doubtful whether even the sugar factory can stand competition of foreign sugar landed in India, once the heavy protective duties are abolished or even reduced. The selection of industries with a view to utilise raw

materials and waste materials is too ticklish a question to be decided by sentimental considerations.

Transport. Transport must be a big problem in an estate covering an area of 45 square miles. Walchandnagar is 30 miles from Diksal station on G. I. P. Railway in the Madras-Bombay line and 20 miles from Baramati on the M. S. M. Railway. These two stations provide the main channels of communication for Walchandnagar with the outside world. Huge quantities of raw materials, especially sugarcane at the rate of about 1,200 tons per day in the crushing season, have to reach the factory and the finished products, mainly sugar at the rate of 120 tons per day and refined oil etc., have to reach Diksal, where the company has railway siding with ample storage accommodation. A narrow gauge railway, rather tram line of 2½ feet, has been laid through the entire length of the estate—65 miles—and it involved the construction of two major and several minor bridges on the Nira and Nala rivers. Apart from this light railway, which is designed to carry a limited number of passengers in addition to goods, the company maintains a big fleet of motor lorries and buses, 23 in all, carrying goods and passenger to a distance of 45 miles—an amenity very much prized by the people in the estate and neighbourhood. It is the ambition of the company to connect Walchandnagar with Sholapur and Poona in course of time. There is a regular private telephone service in the estate which connects the main office with the six agricultural stations, and another which connects Walchandnagar with Diksal.

Technical Staff. The company has on its staff 18 agricultural graduates (not too many for 17,000 acres), 10 chemists most of whom are attached to the sugar factory and 10 mechanical engineers, some of whom are in charge of tractors. All these officers are expected not only to look after routine work of the farm and the factory but also to experiment and suggest improvements—especially in the off-season. The salaries paid to the staff compare favourably with those paid by Government or any other concern for men of similar qualifications and experience. Pucca buildings have been erected to house the staff at a moderate rent.

Labour. The labour employed in the factories is about a thousand strong. Agricultural labour in the busy season is about 5,000. Altogether a labour population of about 8,000 has had to be accommodated in different parts of the colony.

Housing. Accommodation in pucca stone and concrete buildings has been provided for 1350 families already, and more are in the course of construction. Electric lights and flush-out latrines (one for every block of houses) and underground drainage have been provided for all quarters, labour as well as superior staff. We must, however, take leave to say that the whole housing scheme for labour has an urban and industrial rather than a rural aspect about it, because of the blocks of houses, monotonous in their uniformity and drab in their exterior without a single verandah running on any side each house being divided from the next only by walls or

asbestos sheets. The atmosphere would be really rural, not that of a *nagar* if small independent houses or cottages had been built with verandahs, running on two sides at least and open space round about, however small. Surely this would cost more to build than blocks of houses; but a garden city is nowhere a cheap affair.

Medical Aid, Education and Recreation. Medical aid—Ayurvedic as well as Allopathic—is given free to the residents and others who resort to the dispensary and hospital, which is provided with 24 beds. Free primary schools have been running in various sections of the colony and there is also a secondary school located in a fine building. Drill and physical exercises are not neglected. Boys and girls are trained to do them in accompaniment to music. Elders have their reading room and club for sports and recreations. A pucca market with 40 shops caters to the needs of residents.

Gain to the Country. There is no doubt that the country as a whole has greatly benefited by this enterprise, which is ever growing. The state has also benefited a great deal by the contributions made by the company to the coffers of the State. In 1942—43 the company paid about Rs 2.5 lakhs as irrigation dues and Rs. 10 lakhs as excise duty besides indirect contributions in the shape of railway transport charges amounting to Rs. 1.3 lakhs last year. The State, of course, has been losing a little by the restriction of imports of sugar in the pursuit of the policy of protection to the sugar industry in the country.

Security and profit-sharing. The greatest criticism against this large-scale farming is that the peasant-proprietors have become wage-earners with a certain amount of subservience and risk of unemployment. Mr. Walchand says that these men were only nominally free but were really half-starved and half-clad and generally in debt, while now they receive a better income as the wages are higher (10 as. per day) and they are provided with food-stuffs at prices much lower than in the market, and above all they have "no anxieties pertaining to the land". This is not a point of view relished by peasants who prefer security and independence, though with some suffering, to doing things at the beck and call of masters. Much of the criticism will lose its force if, as Sir M Nanavati suggested, in addition to higher wages and greater security of tenure the workers were assured by the management of a share of the profits of farming, even as the workers in the estates in England, of Henry Ford and Elmhirst have been assured.

The management will do well to encourage among its employees healthy trade-unionism and co-operative organisation for the provision of credit, food-supplies, clothing etc., and the running of hotels and restaurants.

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of sugarcane were ascertained by Mr. V. Srinivasan, B. Sc. Ag., (now Agricultural Demonstrator, Shiyali) who also attended the Conference.

Thanks are due to Mr. Gulab Chand (the brother of Mr. Walchand) who is at the helm of the management of the estate and took round the delegates to the farms and factories and unreservedly answered any questions asked.

SELECTED ARTICLE

Economy of Feeding Home Grown Berseem to Cattle

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Farm animals require food for growth, production of milk and performance of mechanical work over and above the amount required for the upkeep of the body. Nearly one half of the feed consumed by an animal is required for maintenance. Insufficient supply of feed naturally results either in a falling off in the production or in the conversion of body substances into products. Hence, it is hardly possible to improve the cattle only by breeding when they are not properly fed.

Requirements of cattle - Food is necessary to supply energy, protein, minerals and vitamins. Energy or fuel is required to maintain body temperature and to support the vital activities of the various organs; protein to repair and build up body tissues or to supply the protein of milk, minerals to form bone, maintain the mineral matter of the body or to supply the requirements of milk. Vitamins are necessary for the efficient functioning of the cells and organs of the body.

The quantity of the nutrients required depends upon the size of the animal and the amount of production expected. However, the yield of production cannot be increased beyond the maximum capacity of the animal by any amount of feed, the capacity as a producer is an individual characteristic.

It is not always possible to supply all the ingredients required only in the form of coarse and bulky fodders, such as hays and straws, as the capacity of consumption is limited. Hence concentrates (grains, oil-cakes, etc.) containing the nutrients in a concentrated form are also necessary to supply the requirements within the limited capacity of intake.

The stock man should understand the requirements of his animals, also the feeding value of the feeds available in the market and what can be raised economically on his holding. Usually the farmers are recommended to feed grains and oil cakes to cattle for better production, but these high priced concentrates are not always economical. With dairy cows, the economy of feeding depends upon the production capacity of the animal. It may be profitable to give purchased feeds to a cow with heavy milk yield when the concentrates are not very high in price, but under Indian conditions where cows are usually low producers such feeds are seldom economical. Similarly for a continuous thrifty growth only a limited allowance of concentrates can be made. In such cases, legumes may provide the most economical ration. *Guar*, soybean, *urid* or *mung* during the *kharif* and *senji*, *shaftal*, lucerne and berseem in the *rabi*, season are suitable leguminous crops.