

SEEING IS BELIEVING

LANDMARKS OF ACHIEVEMENTS IN
ANIMAL HUSBANDRY
VETERINARY SERVICES
DAIRY DEVELOPMENT
OPERATION FLOOD
ALIPORE ZOO

'76

Seeing Is Believing *76

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Land mark of achievements in Animal Husbandry,
Veterinary Services, Dairy Development, Operation
Flood and Alipore Zoo

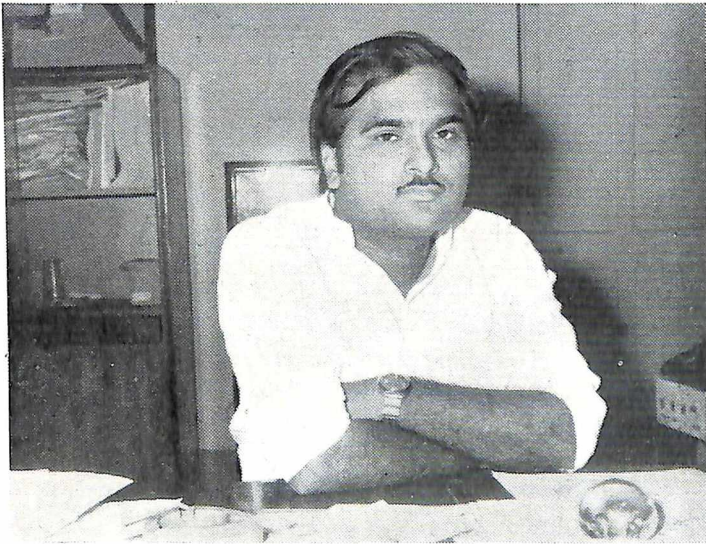
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GOVERNMENT OF WEST BENGAL
ANIMAL HUSBANDRY
AND VETERINARY SERVICES
DEPARTMENT

FOREWORD



SINCE the dawn of human history animals have been associated with the human beings. Either men and women had to defend themselves from the attack of wild animals or the animals were hunted by men for food and survival. Men used various animal products to clothe themselves and to meet their other needs. Later hunters became herdsmen as population increased and human intelligence grew. As population rose further and further and as food became scarce most of the herdsmen settled down and became farmers. As farmers they used horses and cattle for tilling lands, as draught animals, for producing oil from seeds, for irrigation (i.e., persian wheels) and for many other purposes. Earlier as hunters they had

trained dogs and horses to assist men in the hunt. Today scientists are using animals for research and experiment. Horses, chariots and bullock carts helped nations and races in communicating with one other by providing easy mode of transport for carrying passengers and cargoes. Pack animals are the beasts of burden, the camel is the ship of the desert, and the elephant is a live tractor. This also helped trade and commerce and interchange of culture. Thus it is easy to understand that animals are intimately linked with the growth of human civilisation. This explains men's love for animals who lived side by side with human beings through the ages either as friends or foes. Men domesticated some animals and birds like horses, cattle, sheep, goats, camels, dogs, cats, hens, ducks, elephants, etc. Other animals were left behind in the jungles as men started living in towns and villages outside the caves and jungles. But still man's love for wild life remained undiminished and that explains the birth of the Zoological parks, wild life sanctuaries, Tiger projects, etc.

Man has thus used animals for—

- (1) producing wealth like food, clothing and other consumer goods,
- (2) transport and mobility,
- (3) agriculture and irrigation,
- (4) small cottage industries like oil mills, etc.,
- (5) scientific purposes.

To do these man had to learn by experience animal husbandry which means care and management of animals and birds for satisfying human wants.

Animal husbandry has many branches like dairy husbandry, sheep rearing, goat rearing, poultry, pig husbandry, etc. Animal husbandry includes breedings, feeding, management, marketing and protection of animals from disease and epidemics.

Animal husbandry occupies an important place in agriculture. Both are complementary. Animal wastes and farm-yard manures are

used in agriculture and agricultural wastes and by-products can be fodder for animals. So it is economical to take up animal husbandry along with agriculture. Moreover diversification of occupations fetches a higher income. So the rural farmer has to start some cottage industry also along with agriculture and animal husbandry.

Animal husbandry is a part of the total activity of the agriculturist. The farmer needs horses, buffaloes or bullocks to plough his field, to market his farm produce in the bullock cart, to irrigate his field with the help of bullock in persian wheels, to increase soil fertility by using manure. To supplement his income, the farmer has to rear cows to sell milk and milk products. The agricultural wastes and by-products also can be used as fodder for animals. This means easy disposal and utilisation of these resources as inputs in animal husbandry which gives economic value to the agricultural by-products which could not be sold otherwise in the market. The farmer can also sell meat, eggs and wool, etc., by rearing sheep, goats and poultry.

Even carcasses of dead animals can be utilised and these have various uses like bonemeal, hides and skins, glue from hoofs and horns, etc.

Animal husbandry is also a branch of science. Even in the primitive age when scientific knowledge began to grow, animal husbandry was a part of science. Necessity was the mother of invention. In the dim past animals provided the main resource of human beings and also supplied power to drive small machines. So animals occupied a dominant place in human economy in the primitive society. Mankind is on constant march in the field of productivity. Man's struggle is an eternal struggle to increase productivity. That is human history. To meet the challenge of population explosion man's only hope is break-through in productivity with the help of science and technology.

It was clearly realised by men and women that human survival depends upon development of science and social sense. That is why the first step of man in the primitive society was to explore the field of science in animal sciences, animal production and animal husbandry as animal husbandry came before agriculture and irrigation. Animal husbandry was thus probably the first productive activity of human beings in the primitive stage to meet the challenge of food problem. People therefore tried to evolve better strains of cattle for higher productivity and greater efficiency. Thus men tried to explore scientific knowledge to apply this in the field of animal husbandry for improved breeding, improved feeding and better management for higher productivity. Epidemics and diseases were taken a heavy toll of animal life and people were losing animals on a large scale due to large-scale deaths of animals. Even if there was no death disease of animals affected production, their growth and efficiency, milk yield, etc. So men devoted to science to control disease and epidemics to protect and preserve their animals. Medicine is the matter of science. To provide adequate health coverage the experts devoted to veterinary science and animal sciences to invent preventive and curative medicines, Bio-products, vaccines, disease investigation methods, pathology, anaesthesia. They took up study and survey of animal diseases including viral diseases like foot and mouth, Ranikhet, Marek's disease, Rinderpest, Rabies, etc., bacterial diseases like anthrax, tuberculosis, etc., parasitic and helminthic diseases like nasal granuloma, coccidiosis, worms, liver fluke, etc. Now diagnostic laboratories have been set up in every district in West Bengal. This is unique a feature in India and this has been appreciated by many experts of other States. In the field of fodder cultivation also animal husbandry has taken the help of science and high-milk yielding grasses like hybrid Napier, hybrid para have been evolved along with improved legumes like cow pea, Berseem, Rio, alfalfa. and Lucerne.

In the field of genetics and breeding also there has been a major break-through. By means of cross breeding programmes through artificial insemination with the help of dilute and frozen semen new strains for better milkers have been evolved. We are now able to combine the high milk and meat yielding capacities of exotic cows with the heat tolerance and disease-resistance of indigeneous cows. West Bengal can now boast of Jersey cross-bred and Holstein cross-bred cows. These have won prizes and awards in the All India Cattle Show and milkmen from Punjab even are now willing to buy cross-bred cows from farmers of West Bengal.

Animal Husbandry has also built the edifice of dairy technology and industries based on animal products like Bacon Factory, Meat Processing Plant, Abattoirs and Slaughter Houses, Carcass Utilisation Industries, Tannery, Footwear Industries, etc., all with the help of science and technology. The list is only illustrative, not exhaustive and this is a subject on which can be written not volumes, but libraries. In fact vast libraries have been set up all over the world embracing this subject.

Animal Husbandry is thus intimately connected with science and agriculture. It has to take the help of science to make agriculture more meaningful. Research is a continuous process. Man's quest for the unknown has always led to the conquest of his baffling problems. Man rode horses for many centuries and is still riding horses. Human civilisation has marched ahead riding animal husbandry and animal husbandry will carry us on its shoulder for days to come. Let us all realise this and focus our attention on the developmental works in the field of animal husbandry where the scope is unlimited whereas the scope in agriculture seems to be rather limited due to the fact that there is an excessive pressure on land which is limited. Population is rising and land is diminishing as more and more lands are being diverted to

railways, roads, townships, industries, etc. Animal Husbandry is neither a luxury nor a whim. It is essential for our future survival. This widens the scope for ensuring livelihood and boosting cash earnings of villagers and agricultural farmers who have to face forced idleness in the lean seasons. We have to produce more eggs, more meat, more milk. Scientific animal husbandry gives the answer

to the problem. So we must increase and augment the useful and valuable livestock small animals and poultry through intensive cattle and poultry development and other developmental works.

Along with the green revolution, let there be egg revolution, and white revolution through the "Operation Flood".

Pranab Chatterjee

MINISTER OF STATE

Incharge of Animal Husbandry and Veterinary Services
Department, Government of West Bengal



ANIMAL HUSBANDRY SECTOR

CATTLE DEVELOPMENT

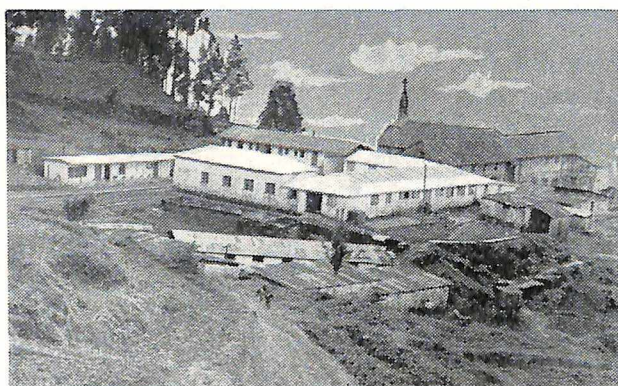
(i) **Central Semen Collection Station:** The State Government has taken a policy for improvement of indigenous cattle producing on an average 283 litres of milk per head per year by cross-breeding through artificial insemination programme. The objective is to combine the productive ability of exotic animals with that too disease resistance and heat tolerance of indigenous animals. As against 283 liters of milk of indigenous cow, cross-bred cow produces about 1,800 liters of milk per head per year. The age at first calving for cross-bred cows is 30 months as against 48 months of indigenous cows. The calving interval is 13-14 months in case of cross-bred cow as against 18-19 months of indigenous cow.

For massive cross-breeding programme, we need Semen Collection Station for collection of germ-plasm from exotic bulls, process, store and distribute through different A.I. Centres for insemination of the indigenous cows.

Animal Husbandry is essential to solve food problem as well as unemployment problem—we must produce or perish.

Though Animal Husbandry Development work was started practically from the year 1936, the real break-through in the Animal Husbandry Development work was made during the last four years in the shape of various infrastructures as well as increased production. The major activities are high-lighted below.

Since independence up to 1972, there were 9 Central Semen Collection Stations for the above purpose. During the last four years including the current year—9 additional Central Semen Collection Stations have been established enabling us to collect more germ-plasm from exotic animals to cover a greater number of cattle. Out of these nine, two have been established by mobilising existing resources. The growth rate in the establishment of Central Semen Collection Station is 100 per cent. during the last four years in comparison to the period up to 1972. The photograph below shows one of our Central Semen Collection Stations.



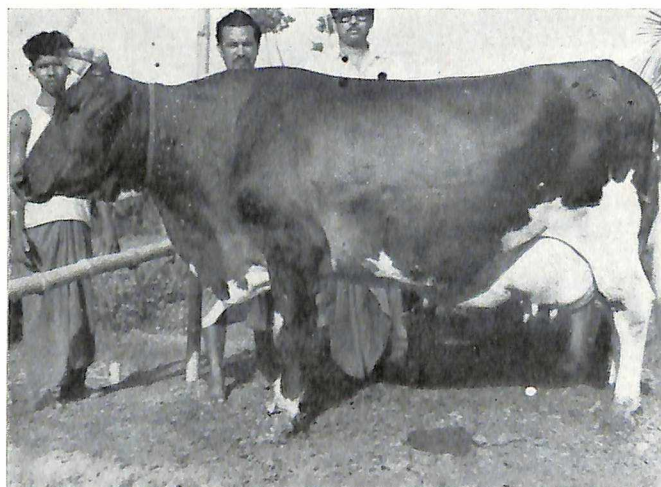
(ii) **Number of A.I. Centres:** Till 1972 there were 542 A.I. Centres. Each centre was established to command 800-1000 breedable cattle manned by one Field Assistant to perform the A.I. work as well as to follow up the work of artificial insemination regarding the performance and also to advise the farmers for improved animal husbandry practices.

Up to 1972 there were only 542 A.I. Centres throughout West Bengal. During the last four years, additional 180 centres have been established bringing in about 1.5 lakh of additional cattle under artificial insemination programme for cross-breeding, i.e., a growth rate of more than 25 per cent. have been achieved. The photograph given on the right top shows one such A.I. Centre.



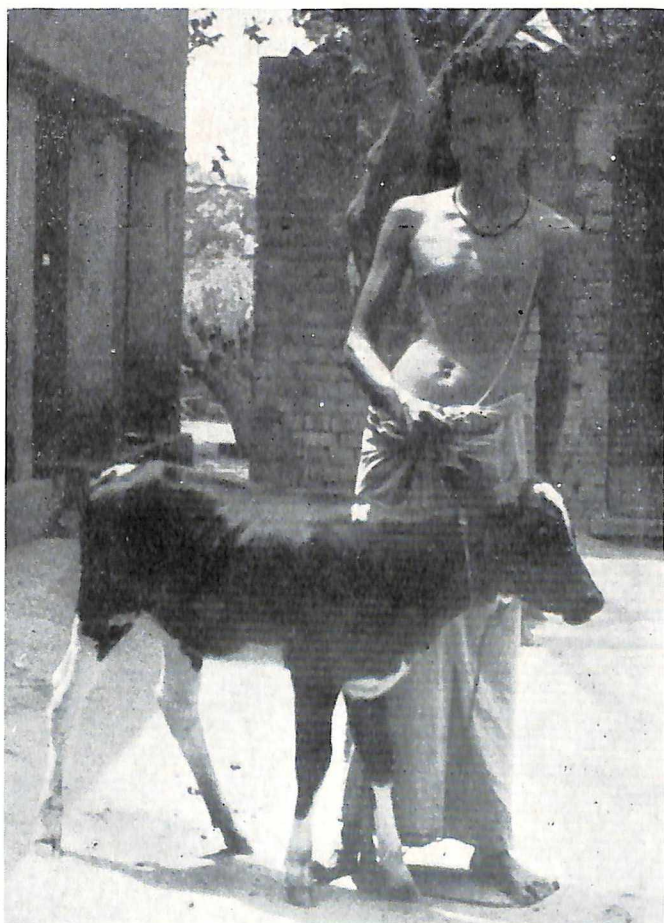
(iii) **Number of cows under Cross-breeding Programme:** Up to 1972 only 2.00 lakhs breedable cattle were under cross-breeding programme. Rest of the cattle were bred by the semen of superior type of indigenous bull. During the last four years, 7.00 lakhs breedable cattle have been brought under cross-breeding programme and except for a small part of Hooghly district rest of the area is being covered by exotic and cross-bred bulls.

The picture of one such cross-bred cow is given below :



(iv) **Provision of Exotic bulls for A.I. Work:** Up to 1972 exotic bulls of Jersey, Holstein and Cross-bred bulls were being used only in the northern 24-Parganas, Nadia district, southern part of Murshidabad district and also in Darjeeling district. Since 1972, in addition to the above areas, exotic and cross-bred bulls have been introduced in the districts of Hooghly, Burdwan, Birbhum, Bankura, Midnapore, Purulia, Malda, West Dinajpore and Jalpaiguri.

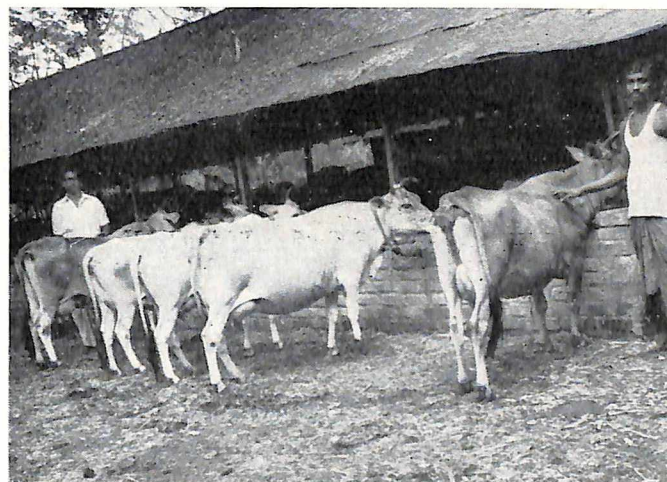
(v) **Number of artificial insemination recorded:** During the year 1971-72, 1,13,679 artificial inseminations were recorded. During the year 1975-76, this is estimated to be 2,10,000.



Calf born under Breeding Programme in the Extension Areas

(vi) **Number of calves born from breeding programme in the Extension Areas:** During the year 1971-72, 46,453 calves of either sex were born, but during the year 1975-76, it is estimated to be 79,000. The picture below is that of a calf born in this programme.

(vii) **Dairy Demonstration Farm:** Leaving aside the Cattle Breeding Farms of Haringhata/Kalyani there was no other Dairy Farm throughout West Bengal. During the last four years, four Demonstration and Experimental Dairy Farms were established in the district of Darjeeling, Purulia and Midnapore.



Organised Dairy Farm

(viii) **Re-generation of Wealth:** At the present rate about 39,500 female cross-bred calves will be born. Even by giving allowance for 20 per cent. mortality each year, about 31,000 cross-bred cows will come into production. Each cross-bred cow produced from exotic bull will give an additional production per annum of about 1.7 tonnes whereas each cross-bred cow produced from cross-bred bull will give an additional production per annum of 1.1 tonne. The average income per month per cow from the first one will be nearly Rs.100 whereas from the second one it will be Rs.75 only. About 30,000 families will have subsidiary or full time occupation with the above range of monthly income.

(ix) **Employment potentiality:** At present according to direct estimation about 30,000 people will find full time or part time employment in dairy farming. Equal number of people will also find part time or full time employment indirectly in the provision of sale of milk, conversion of milk into product and sale thereof, in the cattle feed business, in the transportation of cattle, cattle produces, cattle feed, etc., in dealing with the equipments necessary for cattle business in relation to the cattle and its produces in the form of labour as well as in the conversion of cattle power for transportation and for other industrial use. Also in the industries based on cattle such as, bone, skin, manure, beef, born, medicinal industries, etc.

It is expected that every year not only that equal number of people will get an opportunity of additional employment, but there is a steady growth rate of 15 per cent offering additional employment over the previous year.

(x) **Total milk production in the State:** The total milk production of the State of West Bengal during the year 1968 was 776 thousand tonnes, The figure of 1971-72 is not known. The milk production figures have been estimated to be 945 thousand tonnes during the year 1973-74, 966 thousand tonnes during 1974-75 and 1,014 thousand tonnes during 1975-76.

(xi) **Self-employment:** During the last four years this Directorate organised training of 5,400 individuals in various Animal Husbandry farming

as well as Animal Husbandry practices and trade in relation to the same. During the last four years, more than 2,000 organised dairy farms have been established and more than 2,500 animals have been sold from Haringhata-Kalyani complex either directly or through auction sale which have also provided employment to another 2,000 families directly. A large number of people found employment through goat farming, pig farming, sheep farming as well as through poultry keeping.

Because of the development in the animal husbandry field, a good number of industries based on animal husbandry development in the private sector have developed. These are the hatcheries like Hi-line, Arboracor, Ranishavor, Babcock, Opsara etc. Industrial houses like West Bengal Dairy and Poultry Development Corporation, Hind Lever, Shaw Wallace, Food Fats and Fertilizer, Bhandari Cross-Field and Brothers, Beharilal Dey, Kolay Feed etc. have also come up offering employment opportunities not only in the manufacturing end, but also in the trade channel.

(xii) **Fodder Development:** The base-level distribution for fodder seeds and cuttings for the year 1971-72 was 895 quintals, but the average distribution of seeds and cuttings for the last four years has come to 905 qtls.

It may be noted that during 1971-72 there was subsidy component for the supply of seed like Jowar and Maize also, but since then the subsidy has been withdrawn from Jowar and Maize because of its increased popularity and in spite of withdrawal of subsidy, the average distribution figure for the last four years has increased.



Fodder Field

In Eastern Region livestock and poultry show at Bhubaneswar in 1975 and in the All India Livestock and Poultry Show at Madras in 1976 the West Bengal Government won many awards as listed below.

1. Brown Swiss Graded Cow in milk—1st position.
2. Jersey Graded Cow in milk—3rd position.
3. Holstein—Frisien Graded Cows in milk—6th & 7th position.
4. Large white Yorkshire Boar—1st position.
5. Large white Yorkshire Sow—3rd position.

Certificates won by the Directorate of Animal Husbandry in the Eastern Regional Livestock Show, Bhubaneswar (Orissa), October, 1975 from 27th to 31st October, 1975.

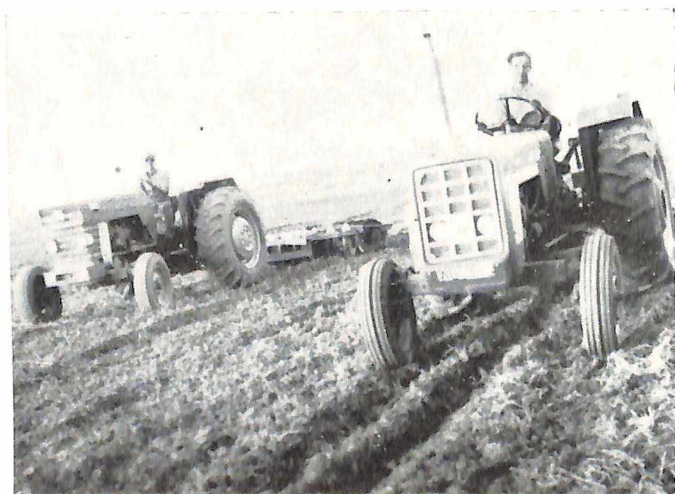
1. Holstein-Frisien Graded Cow in milk—1st position : Cow No. E×H—734
2. Holstein-Frisien Graded Cow in milk—2nd position : Cow No. D×H—2
3. Jersey Graded Cow in milk—2nd position : Cow No. E×J—152
4. Jersey Graded Cow in milk—4th position : Cow No. H×J—203

The base level fodder demonstration plots in the farmers' field was 342 numbers whereas during the year 1972-73 it was 965 plots, 1973-74—847 plots, 1974-75—850 plots. During the current year, a massive programme for introduction of fodder crops in crop rotation as well as introduction of new varieties of perennial crops have been taken to the demonstration plots in the rural areas. It is envisaged to have about 3,000 plots with an average size of 3 (three) kathas throughout the State of West Bengal.

Leaving aside this direct developmental work, people are being motivated for cultivation of fodder crops in the per-ferry land of agricultural field and water areas and also in the homestead areas. During the last four years fodder is being produced on commercial basis in the rural areas. A survey indicated that in the State of West Bengal about 4.82 lakh acres is under fodder crop.



Fodder Demonstration Plot



Cultivation of fodder through improved method



Green grass is carrying to the Farm

POULTRY DEVELOPMENT

(i) Prior to February 1972, the poultry market was very unstable. The price of eggs varied by about 100 per cent from flush to lean season. Similarly, under the marketing scheme few millions of eggs were used to be held in cold storage for more than a year for want of an organised market outlet.

(ii) During last three years, hatching programme has been adjusted after studying the price fluctuation in the market and stabilisation in the price of poultry produces have been brought about. The present fluctuation is limited within 30 per cent as against 100 per cent of the past.

(iii) Marketing has been arranged in such a way that eggs are not held in cold store for more than a period of six months. The steady balance between collection and disposal is being maintained with a reserve stock in hand for off-season.

(iv) The poultry marketing scheme was heavily subsidised which was interfering with the rural efficiency in not only poultry marketing scheme but also in poultry development programme. All subsidy in poultry feed have been withdrawn. The poultry marketing scheme which was running on loss will run in a profit of about Rs.6.00 lakhs during the current financial year.

(v) During March 1972, the base level number of poultry layers were 15,482 in various State Poultry Farms whereas as against that figure today is 28,000 which is being maintained with a growth rate of nearly 100 per cent. During the year 1971-72 the total number of chicks and breeding birds sold were 1.98 lakhs as against that during the current year—it is estimated to be 3.75 lakhs. Prior to 1972, no attempts were made for the improvement of rural poultry but during the last four years it was possible to implement



Backyard Poultry



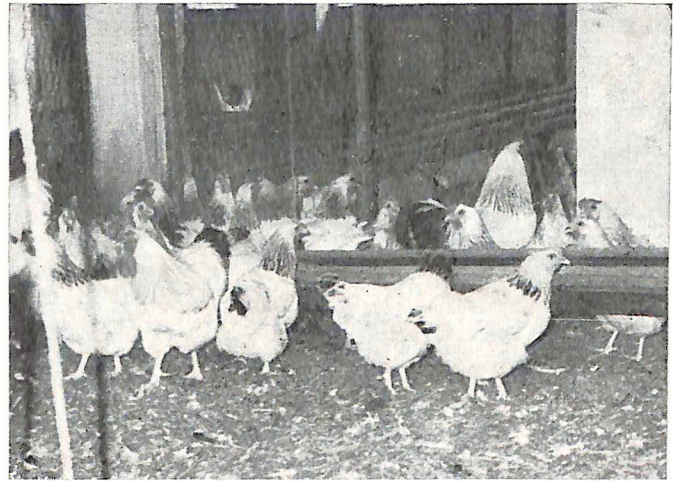
Deep Litter

two Intensive Poultry Development villages in the form of backyard for the improvement of rural poultry in intensified form. Up to 1972, there were eight State Poultry Farms with above 1,000 layers but at present there are 14 (fourteen) State Poultry Farms with above 1,000 layers.

(vi) 70,000 eggs were supplied by Government in Calcutta through various depots in 1974 to stabilise market price. In 1975 the figure shot up to one lakh eggs per week.



Hatching Unit



Organised Deep Litter Poultry Farm



Collection of green fodder from field

PIGGERY DEVELOPMENT

In the Regional Pig Breeding Station, during the year 1972 there was only 148 sows as against that we are having 400 sows now. A growth rate of more than 200 per cent have been recorded.

One more Pig Breeding Farm has been established for the demonstration purposes in the district of Darjeeling.

GOAT DEVELOPMENT

Prior to 1972, no attempt from the side of the Government was taken for goat development work in the rural areas. Since 1972, to till date, nearly 11,000 goats have been distributed in the rural areas through various Government Agencies.



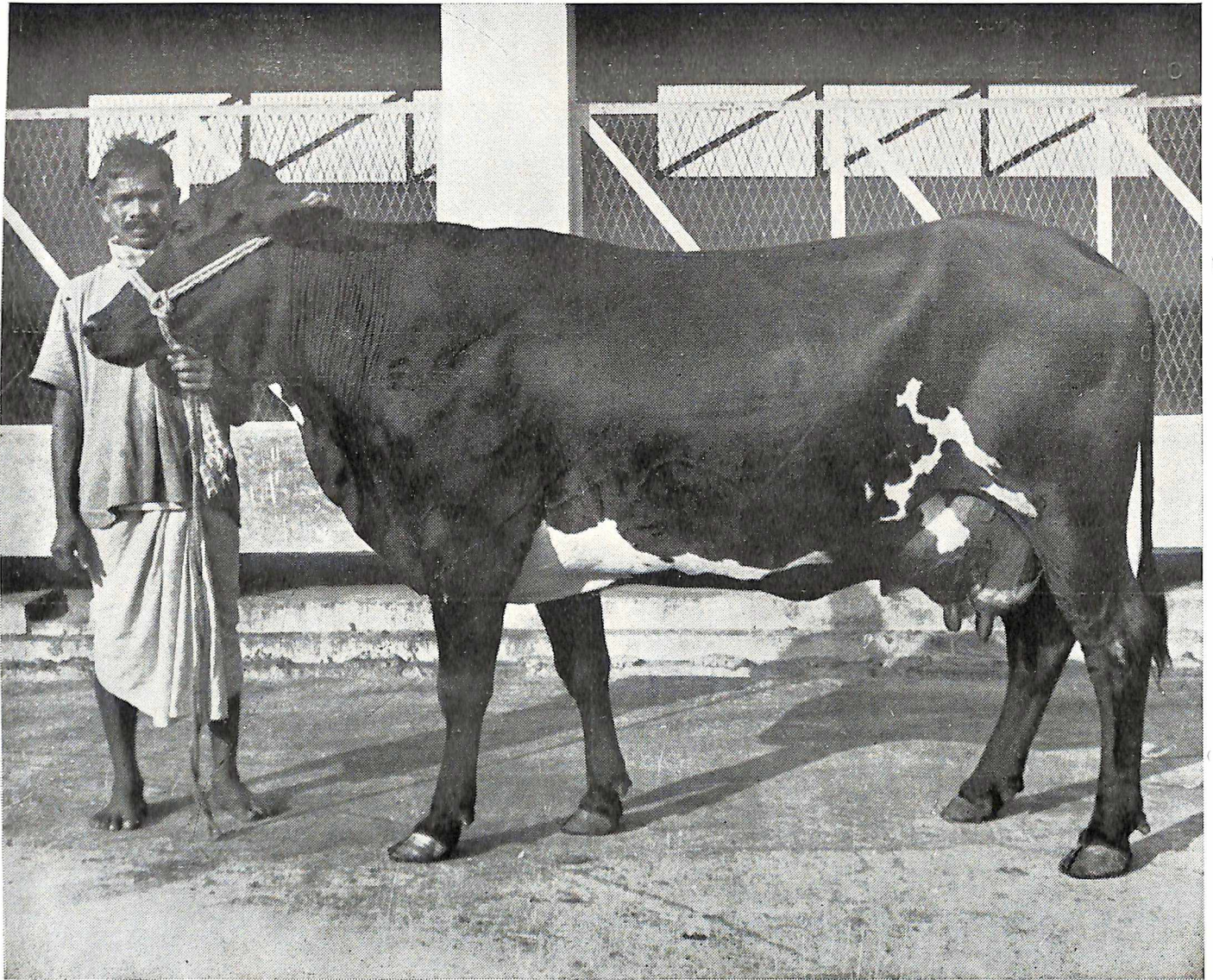
Goats of India have been maintained since early times



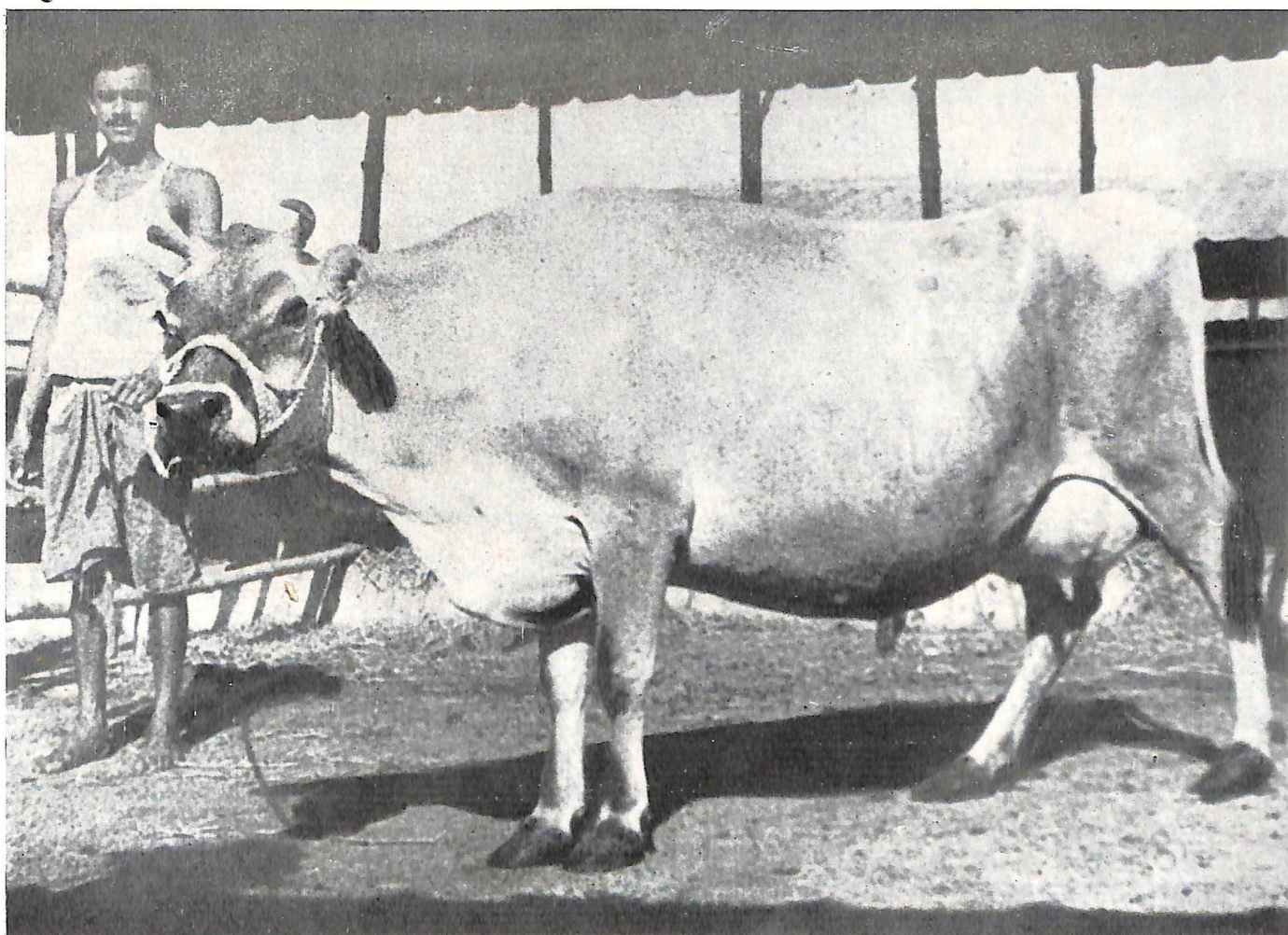
Better Swine Husbandry emphasises good breeding



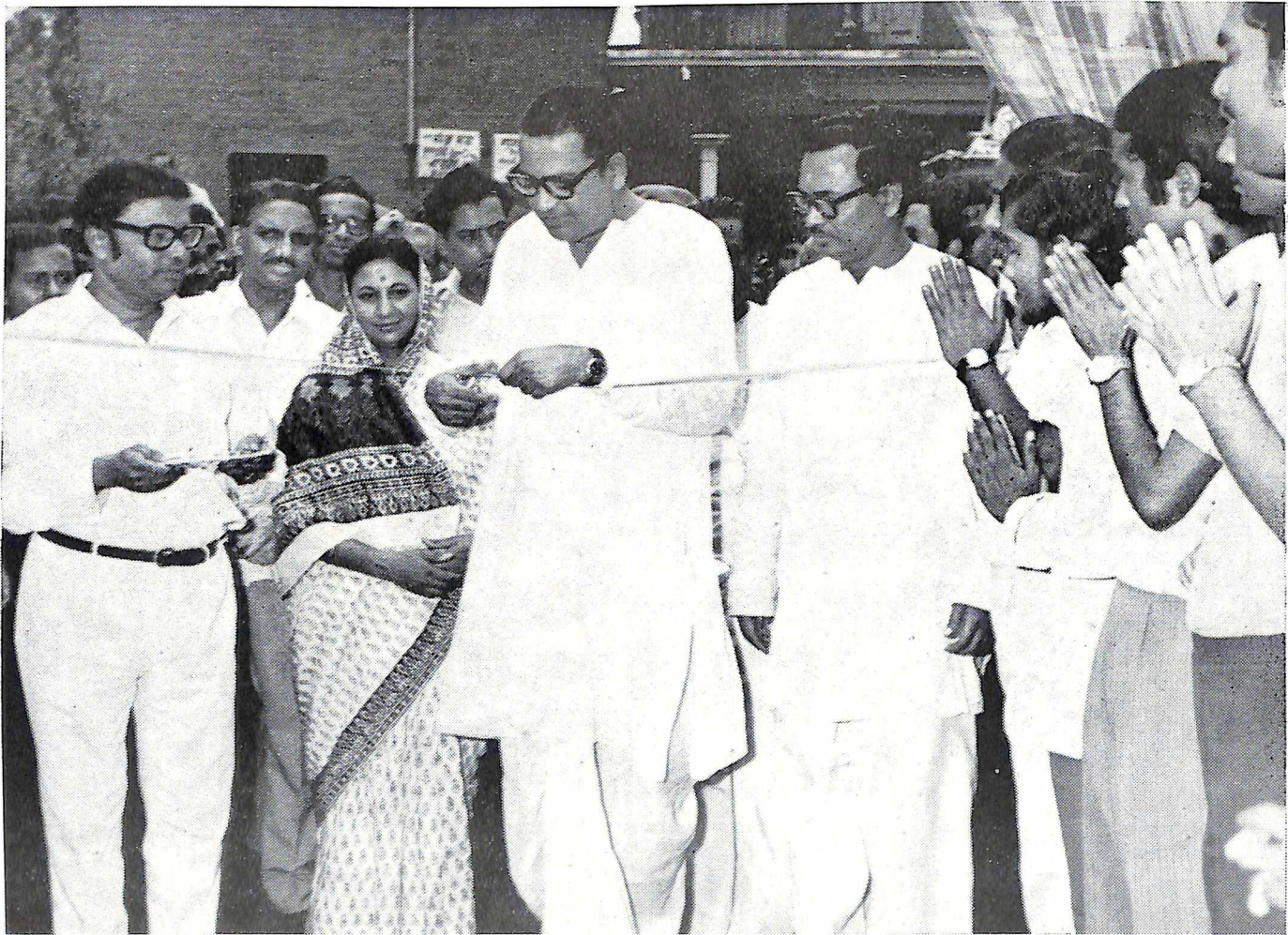
Pig reproduces by multiple birth



Holstein-Fisien cross breed cow at Haringhata Farm



Jersey cow at Bull Mother Farm—Haringhata



Opening of Hospital, Lalgola, by Hon'ble Chief Minister Shri S. S. Ray



Opening of State Veterinary Hospital, Uluberia, by Shri Pradip Bhattacharjya, Hon'ble Minister-in-charge of the Department

Persons serving as animal doctors have existed since earliest times. Veterinary Science flourished in ancient India where separate treatises on the diseases of horse and elephant were written and there were hospitals for various species of animals.

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VETERINARY SERVICES

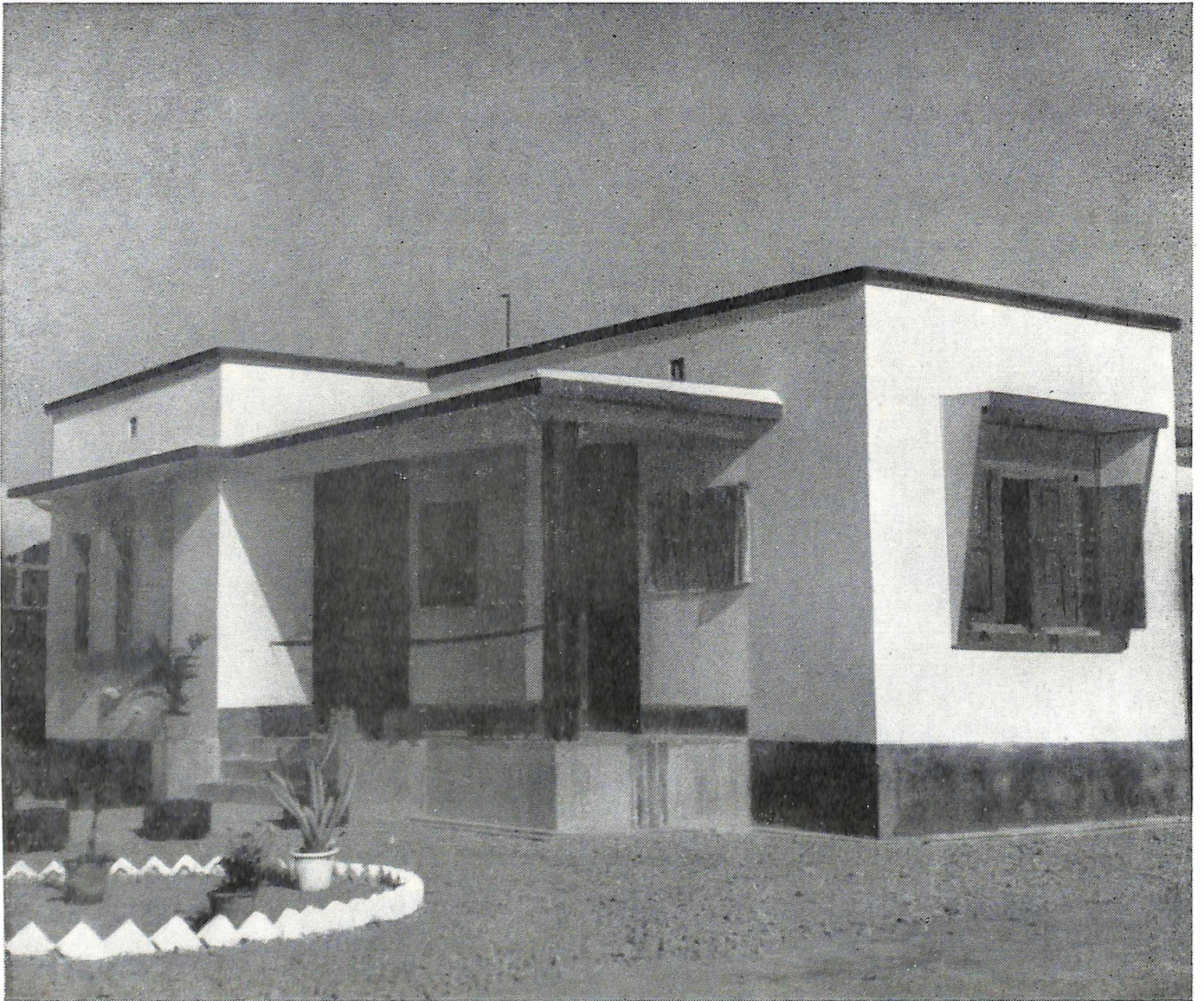
Impact of Veterinary Services to the economy of the country

The growth and development of economy of a country like ours which is essentially agrarian depends on the agricultural production. Animal production and animal health accelerate the development of Agriculture. But any efforts or programme cannot be effectively implemented by Government machinery alone without consciousness of the public and so to say co-operation. Simultaneously, with the crash programmes towards the improvement of Veterinary Services during the last four years, the Veterinary Directorate have launched massive campaign to impress upon the people regarding the impact of animal health services programme on agricultural economy. The people are now showing greater interest about the health and well-being of their livestock which have vital bearing on the betterment of the rural economy.

Directorate's Projects towards the network of Veterinary Services

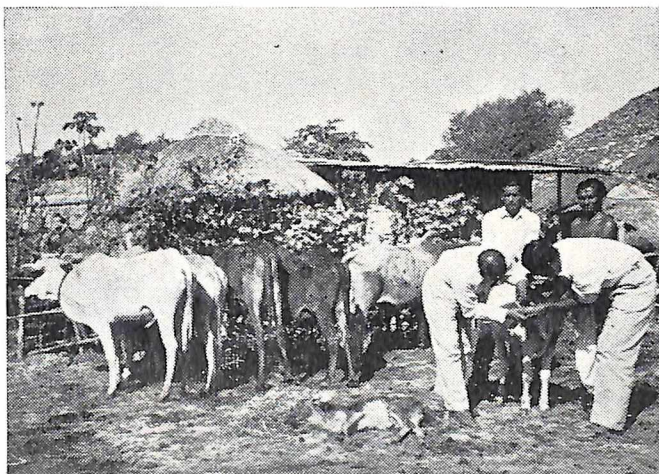
Veterinary Hospitals: In West Bengal, the Directorate of Veterinary Services have envisaged a master plan for building up a network of veterinary services throughout the State. In order to cope with the growing demand for more and better veterinary services, 14 new Veterinary Hospitals in different districts have been set up during this period: (1) Bongaon, (2) Chakdah, (3) Belda, (4) Lalgola, (5) Bethuadahari, (6) Sindri, (7) Karimpur, (8) Jhalda, (9) Mekhliganj, (10) Uluberia, (11) Manbazar, (12) Jhargram, (13) Bidhannagar, and (14) Asokenagar.

Dispensary: In response to the demand of the people, one Block Veterinary Dispensary has been opened at Bharatpur-II during this period in addition to the continuance of 334 Block Veterinary Dispensaries established during the earlier plan period.



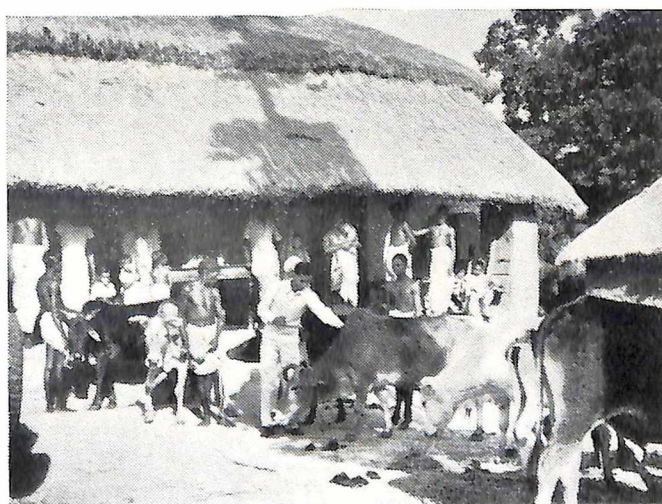
One of the 335 Veterinary Dispensaries

Aid Centres: To extend the facilities of veterinary aids even to the remotest parts of the villages 58 new Veterinary Aid Centres have been established besides continuance of existing Veterinary Aid Centres.



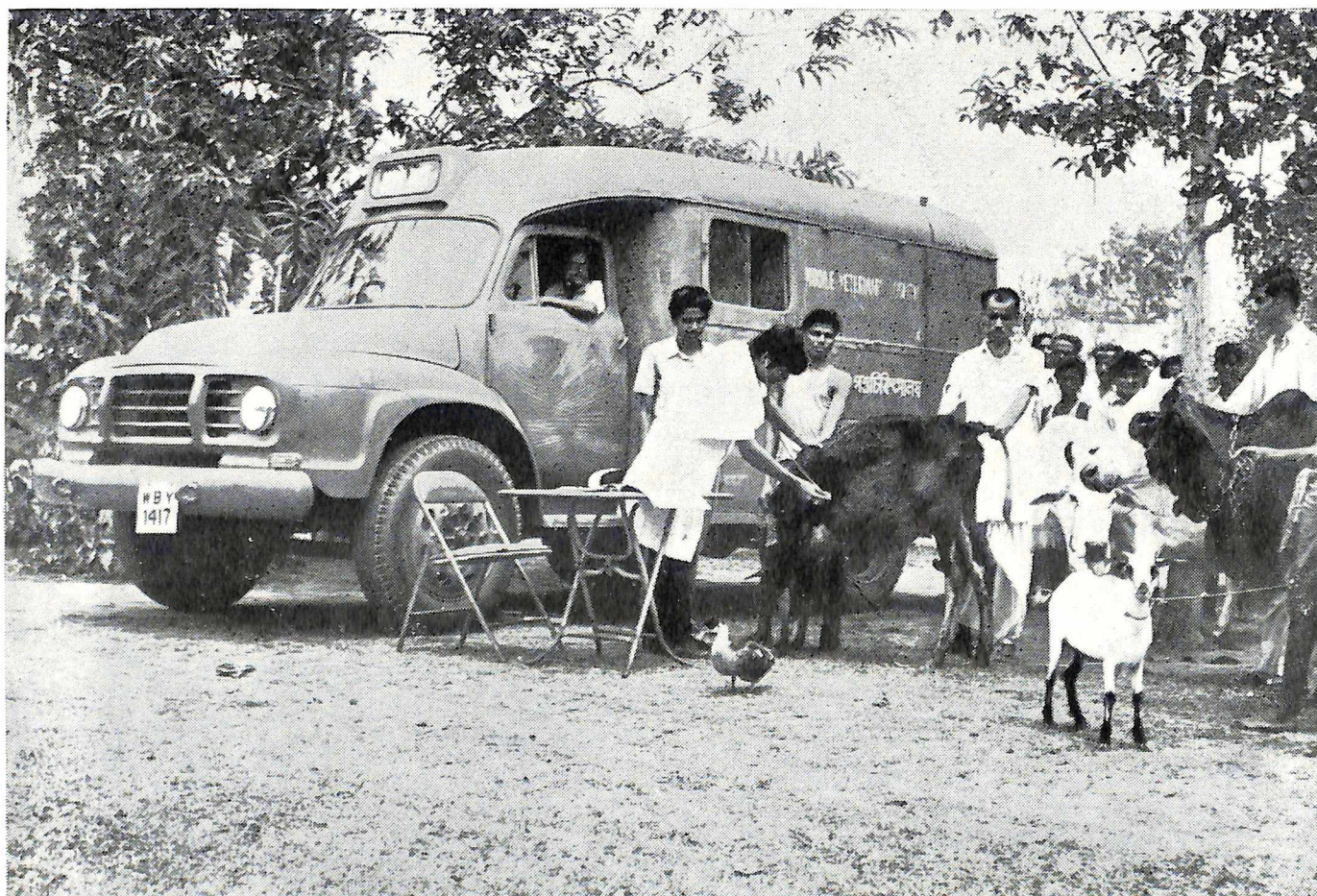
One of the Sub-Centres scattered in the interiormost villages of West Bengal

Aid to the remotest parts of the villages



Mobile Clinic Services: The Directorate tends to carry out veterinary services through its mobile units to the people at their door steps who cannot avail of the services rendered by the Veterinary Hospitals, Block Dispensaries and Aid Centres. 11 new Ambulatory Clinic Units have been com-

missioned for service to the remotest areas, out of those eight such Vans will cover the need for extending veterinary aid to the people in hill areas under the Sub-Plan for Hill Development, two for accelerated development for Jhargram regions and one for the district of Hooghly.



Veterinary aid through its mobile units. An Ambulatory Clinic van

Disease Control and Preventive Veterinary Aids:

During this period preventive and clinical control measures were undertaken more vigorously by this Directorate.

	1972-73	1973-74	1974-75	Estimated for 1975-76,
1. Number of cases treated.	1,715,000	1,982,177	2,400,213	2,465,771
2. Mass vaccination performed.	8,256,060	7,329,704	6,198,922	23,046,248

The following will reveal the extent at which this Directorate could effectively control the incidence of various contagious diseases during the last four years:

	1972-73	1973-74	1974-75	1975-76 (up to January 1, 1976, as per report of D. I. O.)
Number of incidence.	1,204	2,492	1,574	452
Number of animals affected.	26,593	23,633	21,491	5,068
Number of animals died.	9,199	9,029	6,865	2,693

Rinderpest Eradication Scheme: For taking more effective measures in the prevention and control of Rinderpest amongst cattle coming to West Bengal from the neighbouring States, three new Check Posts and five new Vigilance Units have been established during the period.



Strengthening of Block Veterinary Dispensaries:

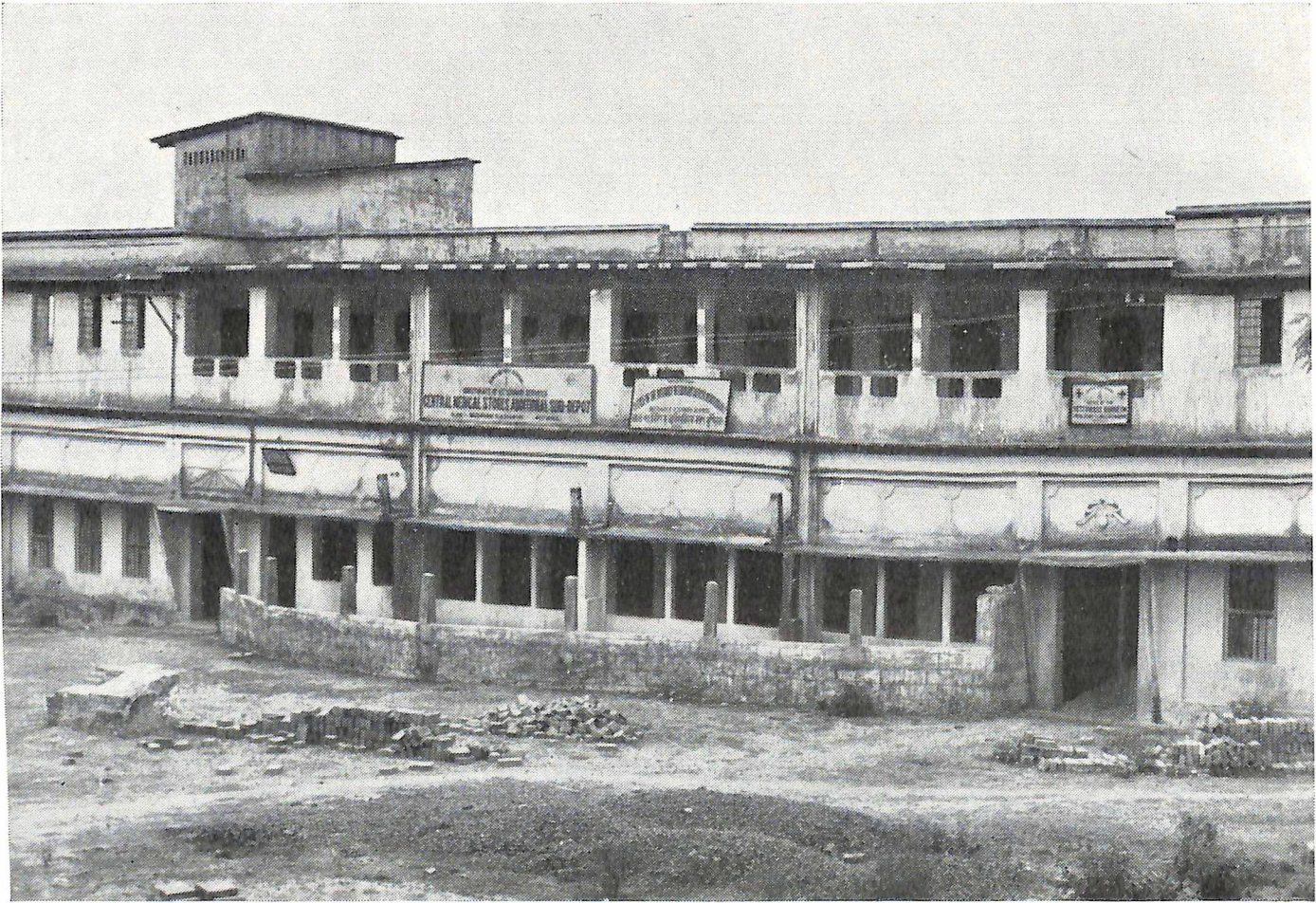
To meet up the increasing public demand for more and more veterinary aids in a much more extensive and effective manner Government have taken a historic decision by creating additional posts of Veterinary Surgeon in each Development Block in a phased manner over the existing strength. So far 140 such posts have been created for equal number of Development Blocks.

Expansion and strengthening of Central Medical Stores activities:

To ensure prompt and timely supply of medicines and stores to the large number of Field Veterinary Institutions, seven new Sub-depots under the Central Medical Stores have been established at (1) Purulia, (2) Burdwan, (3) Berhampore, (4) Raiganj, (5) Siliguri, (6) Midnapore and (7) Ghoom under the State Plan. These Sub-depots are well equipped for making prompt and effective supply of medicines, etc.

The Central Medical Stores of this Directorate has supplied medicines and stores worth of Rs.80,00,597.98. Besides, it has supplied medicines and stores worth of Rs.3,62,000.00 to provide health coverage amongst livestock of flood affected districts in this State. Keeping in view of inadequacy of the existing allotment of funds towards purchase of medicines, etc., for different categories of field institutions, the Directorate is trying hard for further enhancement of fund for the purpose during the year to come.

Check Post. They are assigned to check infiltration of Rinderpest from neighbouring States through diseased animals



Central Medical Stores at Berhampore

Provision for providing free treatment to the livestock: Previously livestock owners had to pay token fees for treatment of their livestock attending Veterinary Hospitals and Dispensaries. With a view to giving relief to all sections of people irrespective of their economic status, Government has exempted to the payment of all charges for treatment of livestock.

Investigation in animal diseases and Diagnostic Services

Calf Mortality: In West Bengal, it has been recorded that nearly 50 per cent of the new born calves face premature death due to various reasons. This poses serious national loss to a great extent. To find out the causes of such premature death and to evolve suitable control measures a scheme entitled "Investigation on Calf Mortality" was studied at the instance of I.C.A.R.

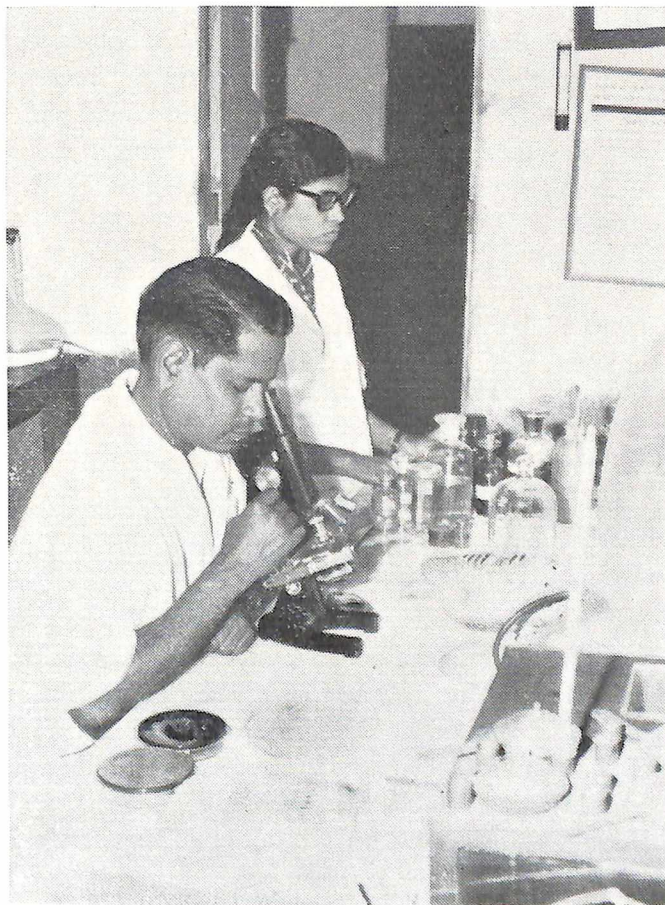
Diagnosis and Prevention of Infectious Abortion amongst livestock in West Bengal: Infectious abortions in cattle causes high economic loss in milk production, reproductive disorders and also physical incapability in males resulting in huge national wastage. This stands in the way of establishing new dairy enterprises and brings about heavy loss to the development of dairy industry. A new scheme for undertaking systematic investigation into the incidences of infectious abortions in livestock has been taken up during the period for implementation in the State with financial assistance from I.C.A.R.

Diagnosis of Type of Foot and Mouth Disease Virus: Extended project in collaboration with I.C.A.R. has been taken up during this Plan period in order to diagnose the strains and substrains of Foot and Mouth Disease in the State. This programme is oriented in such a way that it would help in demarcation of endemic zones of Foot and Mouth Disease in the State and would also act as Regional Virus Typing Centre for the States of West Bengal, Bihar, Orissa, etc.

Parasitic Disease: Huge national loss is being experienced in every year due to parasitic diseases among livestock. To reduce the incidences of work load and other parasitic infections "Parasitic Control Scheme" has been established in the State with Central Laboratory at Calcutta and with its sub-units as many as eight, namely, (1) 24-Parganas, (2) Burdwan, (3) Kalimpong, (4) Malda, (5) Kishnagar, (6) Purulia, (7) Howrah, (8) Darjeeling.

Investigation and Field Diagnostic Services: To give benefits of the advanced diagnostic facilities to the Livestock owners, four new Diagnostic Laboratories have been established in four different districts of this State, viz., (1) Basirhat, (2) Durgapur, (3) Arambagh and (4) Kharagpur besides domiciliary diagnostic facilities have been provided through the establishment of four such mobile units attached with the newly created posts of three Deputy Directors in three Divisional Offices (Burdwan, Kalyani and Siliguri) and at the Headquarters of the Directorate.

Veterinary Research Organisation: In order to carry out systematic researches on various diseases of livestock, a full-fledged Veterinary Research Organisation has been established during the period. The Organisation comprises of three independent sections, viz., (i) Supervisory, (ii) Bacterial Disease and (iii) Parasitic Disease Sections.



Laboratory of the diseases investigation wing

Investigation and Control of Tuberculosis:

With a view to curb down dissemination of T. B. Organisms amongst livestock, systematic survey and investigation on Tuberculosis are being carried out in organised Government and Private Dairy Farms, through establishment of T. B. Control Unit one at Calcutta and the other at Siliguri in this State. Besides these, one full-fledged investigation wing headed by Veterinary office was established during this period.

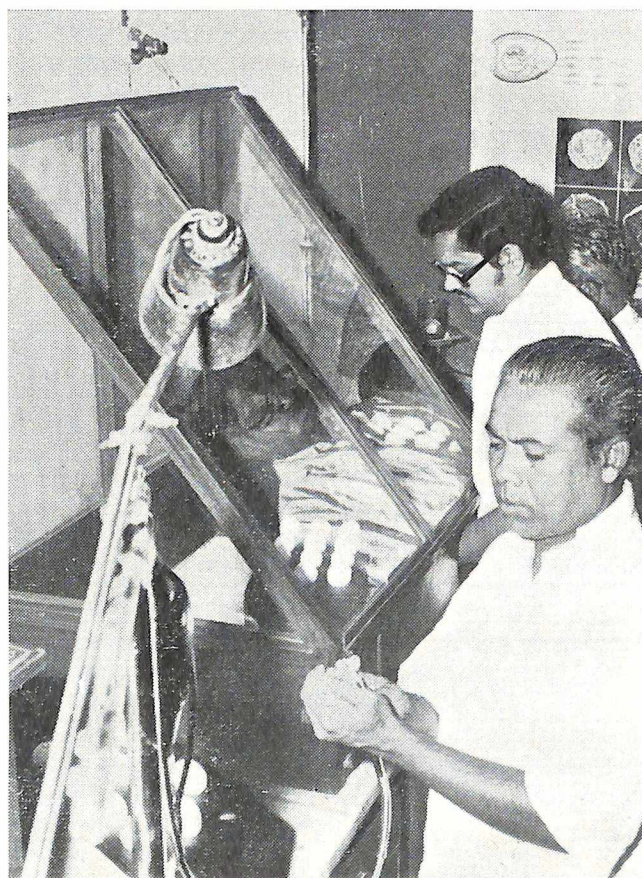
Production and distribution of Biological products

The Biological Production Division of this Directorate is producing as many as 12 types of Veterinary Biologicals at this State Laboratory and not only cater the need of the State but also supply to the States like Sikkim, Bhutan, Nepal, Assam, etc.

The B. P. Institute is provided with most modern equipments and has facilities for manufacturing various types of live viral vaccine some of which are vitally important for protection of Livestock Poultry. For meeting the increasing demand of the production of large type of improved Livestock and Poultry which are expected to come up during the Fifth Five-Year Plan an ambitious scheme has been taken up for the manufacture of more number and newer types of products. For effective suspension a post of Joint Director was created along with creation of more posts in the B. P. Division.

Artificial Insemination

To speed up the upgrading of our existing country-breed cattle to bring about increased milk yield and working capacity of the future cattle generation, facilities for providing artificial insemination are being extended to all the Veterinary Hospitals and Block Veterinary Dispensaries in this State in phased manner. During the period 170,881 number of cows have been covered by artificial insemination through the existing 46 Artificial Insemination Units attached to different Veterinary Hospitals and Dispensaries.



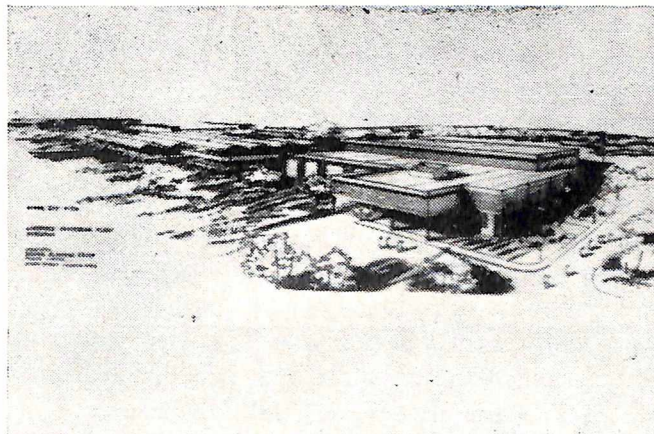
The Biological Production Division—a phase of vaccine production

Establishment of a modern abattoir and supply of wholesale hygienic meat

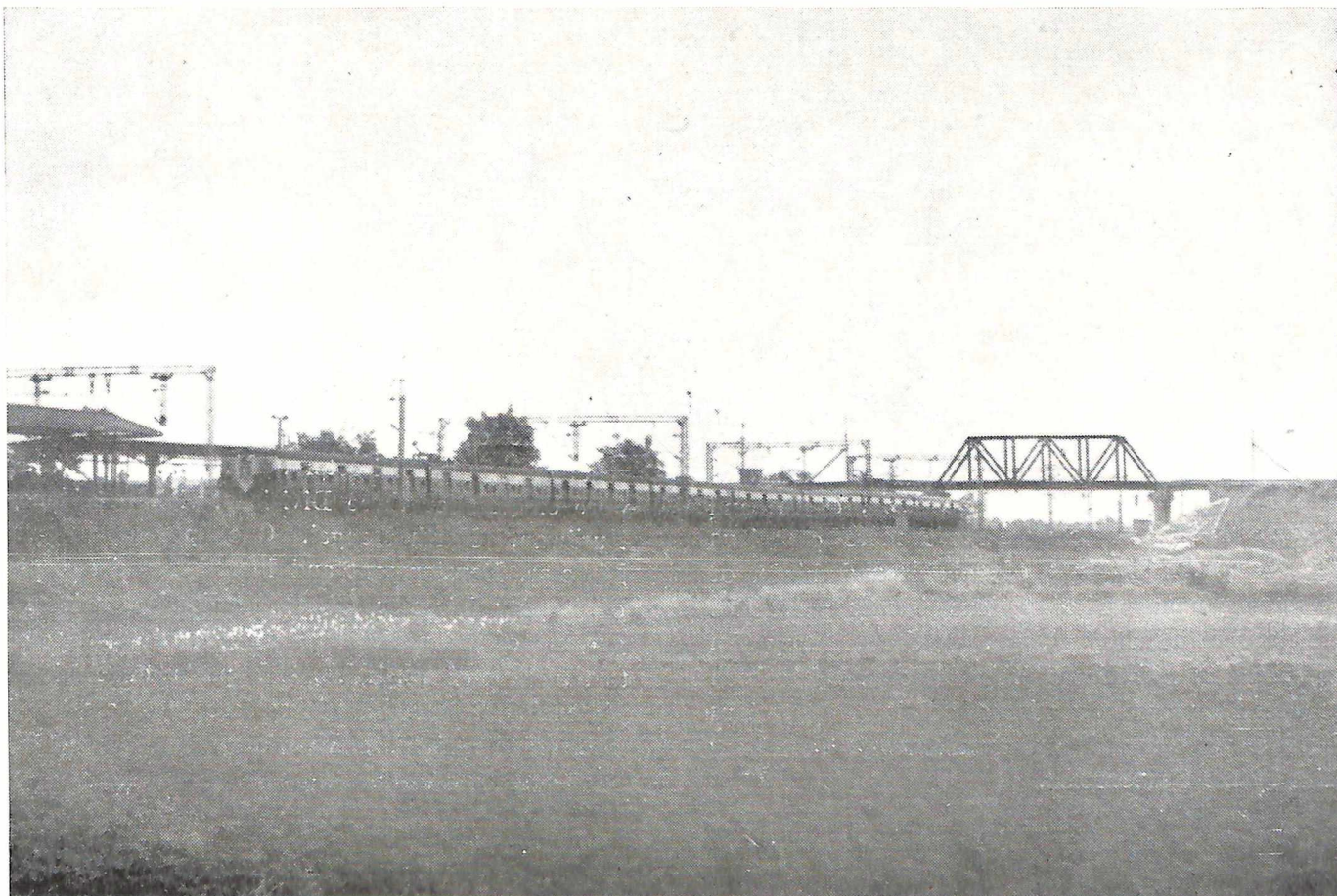
The necessity for establishing of a modern meat processing plant needs no elaboration.

Importance of meat inspection, establishment of meat market and modernisation of slaughter houses in this State including establishment of a meat processing plant has engaged due attention for implementation in this State through the Livestock Processing Development Corporation Pvt. Ltd. With a view to spearhead this Project the Corporation has since been established.

Nearly 80 acres of land has been taken under possession at Andul-Maurigram in the district of Howrah and 15 acres at Durgapur in the district of Burdwan for establishing Livestock Processing Plant.



Proposed Pig slaughter house at Durgapur—Work in progress



Land for establishing Livestock Processing Plant—Andul-Mourigram

The Corporation is also running a Bacon Factory at Haringhata.

Carcass utilisation

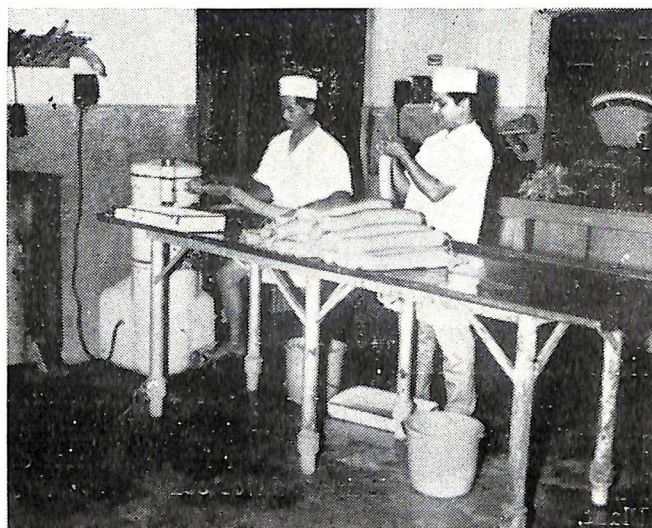
The availability of a large number of fallen animals in this State can provide adequate raw materials for opening new avenues for earning foreign exchange by exporting quality hides and skins as well as for meeting up the increased demand of millions of protein starved poultry, pigs and live-stock population of the country. The scheme is being implemented through the Livestock Processing Development Corporation Pvt. Ltd. which will go in a long way to booster the economy of the backward class of the rural people of the State who are the sole custodian of the industry. Two such centres are being proposed for establishment during this Plan period.

Provision for training educated youths

In order to generate employment potentiality amongst educated unemployed youths in this State, this Directorate during the period has imparted training and subsequently provided employment to 20 Veterinary Compounders and 49 Veterinary Field Assistants.

Campaign for mass consciousness and mass education

This Directorate participated in a good number of Fairs and Exhibits by opening up stall and pavilions, depicting therein the various activities of this Directorate and through models, charts and demonstrations, public were made more conscious about common ailments of animals and birds, of common symptoms of contagious diseases, preventive measures to be adopted, etc. A documentary film covering the activities of this Directorate has been produced for mass education of public of the various facilities made available to them through Veterinary Aids by the Government.



Workers busy in work in the Bacon Factory at Haringhata.

Strengthening of administrative set up: To undertake effective supervision and control three posts of Deputy Directors, Veterinary Services, were created for three Divisions, viz., Presidency, Burdwan, North Bengal. One post of Deputy Director, Development and Planning and one post of Deputy Director (R. P. Eradication) with up-grading of the posts of District Veterinary Officers to the rank of W.B.V.S. 335 posts of Assistant Extension Officer (Veterinary) are to be created by phases to assist the Veterinary Surgeon in the Development Blocks.

Other programme taken up by this Directorate

Apart from a number of schemes included in the State Plan for implementation during the Fifth Five-Year Plan, three Centrally Sponsored Schemes under the agencies of Government of India and a good number of additive programme, viz., Hill Development Programme, Programme under Jhargram Development Board, Sundarban Development Board, D.P.A.P. Programme, Tribal Development Programme, S.F.D.A. and M.F.A.I. Programme have either been launched or are being launched at the instance of this Directorate during the Fifth Five-Year Plan.

With a view to boost up milk production during the Fifth Five-Year Plan, control of Foot and Mouth Disease by vaccination of exotic and cross-breed cattle against Foot and Mouth Disease, vaccination in some selected districts of the State, viz., Darjeeling, Murshidabad, 24-Parganas including Alipore and Calcutta under the aegis of a Centrally Sponsored Scheme have been launched during the year 1975-76.

Under Hill Development Programme a number of schemes have been launched since the last year of the Fourth Plan amongst which establishment of Central Medical Stores Sub-Depot at Ghoom, and setting up of a Disease Investigation Unit at Darjeeling are worth noted. For extending domiciliary veterinary aid services at the door-steps of livestock owners an ambitious scheme entitled Ambulatory Clinic Van Service have been set up in the three hill subdivisions of Darjeeling district as well as in five Development Blocks, viz., Mirikh, Garubathan, Takda, Bijanbari and Sukhiapukhri.

Under Jhargram Development Programme with the same object and purpose, two Ambulatory Clinic Vans are being set up—one out of Jhargram Board's budget, another out of State Plan provision during 1975-76. Besides, various other additive programmes are under order of sanction and expected to be implemented during the remaining period of the Fifth Five-Year Plan.

ANNEXURE 1

Sl. No.	Nature of activity	Total Number/Amount			Estimate for 1975-76
		1972-73	1973-74	1974-75	
1.	Number of cases treated.	1,715,000	1,982,177	2,400,213	2,465,771
2.	Artificial Insemination performed.	45,560	31,324	51,277	4,270
3.	Mass vaccination performed.	8,256,000	7,329,704	6,168,622	7,261,562
4.	Pathological specimen examined.	42,684	44,608	60,573	49,228
5.	Biological products produced in doses.	13,909,808	12,735,380	13,956,555	13,533,914
6.	Medicine distributed.	8,15,534.10	5,17,222.81	7,73,359.77	14,32,107.82

High-lights on some of the most important achievements during the period from 20th March 1972 to 31st January 1976

1. Abolition of hospital and dispensary fees of cattle, sheep, goat, pig and poultry in all Veterinary Institutions all over the State excepting Calcutta has been made.
2. Enhancement of allotment of medicines for hospitals, dispensaries and aid centres.
3. Provision of one Additional Veterinary Surgeon in the Development Blocks in addition to the existing one is being done in phases to extend the facilities for more veterinary aid to the rural people. During the period 140 such posts have been created.
4. Facilities for Artificial Insemination is being extended in all hospitals and Block Veterinary Dispensaries in phases.
5. Establishment of 13 new Veterinary Hospitals, construction of one Veterinary Hospital Building has been completed and one is under construction.



An Exhibition Pavilion at Burdwan Juba Mela, held in the month of March 1976

6. Establishment of 58 Veterinary Aid Centres.
7. Establishment of 12 Ambulatory Clinic Vans.
8. Establishment of one Parasitic Control Unit at Calcutta with 7 sub-units and 7 District Headquarters out of which one at Darjeeling is under the Special Development Programme for Hill Areas (not yet opened).
9. Establishment of 3 Border Check Posts and 3 Vigilance Units under the Rinderpest Eradication Scheme.
10. Establishment of 7 sub-depots under Central Medical Stores.
11. Setting up of one full-fledged Disease Investigation Unit.
12. Establishment of one Disease Investigation Unit for Hill Disease at Kurseong in the district of Darjeeling.
13. Establishment of two Clinical Laboratories at Arambagh and Durgapur.
14. Establishment of one full-fledged Veterinary Research Division.
15. Setting up of two Co-ordinated Research Projects into Calf Mortality and Infectious Abortions in Livestock.
16. Taking up of large scale production of Swine Fever Vaccine.
17. Establishment of a full-fledged Abattoir Project Cell.
18. Setting up of one West Bengal Livestock Processing Development Corporation, which is statutory organisation for establishment of a Modern Slaughter House Complex and utilisation of Animal By-products.
19. Possession of nearly 80 acres of land at Andul-Mourigram for establishment of one Slaughter House Complex and one International Quarantine Station.
20. To provide Health Coverage among livestock affected by the recent flood in different districts of West Bengal this Directorate has provided an additional amount of medicines of worth Rs.3,62,000.00 during the period.
21. Under Special Employment Programme, this Directorate during the period has imparted training and employed 20 educated youths as Veterinary Compounders and 40 youths as Veterinary Field Assistants.
22. A documentary film covering the activities of this Directorate has been produced for mass education of public of the various facilities made available to them through Veterinary aids by the Government.

INTRODUCTION

The diseases of animals are as old as rocks and the maxim "prevention is better than cure" has yet, perhaps, not been substituted by any other better words or methods.

A time was there when we were nothing but simple on-lookers during the out-break of cattle plague, Foot and Mouth Disease and various other burning disease problems. But with the continued efforts of scientists all over the world we have been able to evolve a large number of successful weapons to combat against so many menacing livestock and poultry diseases.

The idea behind the publication of this Hand Book is just to enlighten the common men of signs, symptoms, etiology and effective measures to be taken against some common diseases of cattle, poultry, etc. The owners of livestock are, however, requested to keep contact with the local Veterinary Doctor and take advice and guidance in each and every step to maintain a disease free, healthy and productive herd.

The Veterinary Doctors with their skilled staff are there all the year round to cater to the needs of the farmers.

some "do"s and "don't"s

Any problem with Animals!

Regarding Diet, Management, Breeding,
Housing and Disease!

Consult Registered Veterinarians.

During Cattle Epidemics

1. Isolate those animals which show any unusual symptoms e.g. rise of temperature, dullness, loss of appetite etc.
2. Disinfect the premises thoroughly.
3. House the infected animals separately, engage separate attendants or attend healthy animals first and then the infected one. Disinfect your hands, feet, etc. after attending the animals.
4. Contact nearest Veterinary Institution.
5. Bury the carcass in a pit, 6 ft. deep and cover with 1 ft. of lime. Better to cremate carcasses with beddings and litter.
6. Scrape the stables using 3% crude soda. Then spray 5% sol. of phenyle, white wash containing $\frac{1}{4}$ pounds of carbolic acid per gallon.
7. Protect your animals with Vaccine.
8. Keep a carcass for post-mortem examination prior to give call to Veterinary Doctor.

Any dog bite

1. Wash the biting site with washing soap immediately and then may apply Nitric or Carbolic acid.
2. If possible keep watch over the dog for 7-10 days. A rabid dog is sure to die within this period.
3. Consult Veterinarians and human physician.
4. Protect yourself or your animals with Anti-rabic vaccine immediately.

Breeding

Allow your cows to be conceived by Artificial Insemination methods.

Calf mortality

1. Feed Colostrum.
2. Treat regularly with different kinds of Anthelmentic drugs by a Veterinarian.
3. Vaccinate your calves against Foot and Mouth Disease, Black Quarter, etc.
4. Treat cold immediately.

Wounds and Cuts

Wash the wound and immediately apply anti-septic lotion (Dettol etc.) and bandage with antiseptic ointment. Stop bleeding.

Don't be a victim of Quacks.

1. Don't delay or conceal any outbreak of disease.
 2. Stop grazing animals in common grazing fields.
 3. Don't send the affected animal to cattle markets for disposal.
 4. Stop movement of animals and fodder from one village to another.
 5. Don't throw the carcasses here and there.
 6. Avoid holding any cattle fair, during outbreak of cattle disease.
1. Don't neglect any dog bite.
 2. Don't kill your dog immediately. Chain it up and feed it properly.
 3. Don't waste any time.

Don't cover your cows with stray bulls.

Don't let your valuable calves be a victim of parasitic or bacterial disease.

Don't neglect cold and fever.

Don't neglect a cut or wound. Don't try to stop bleeding with dust etc. It may bring death from sepsis or Tetanus.

Poultry and poultry products form highly nutritive supplement in food. Poultry keeping can be developed as a profitable business, a resourceful cottage industry, if we can limit the source of infections by preventive and curative treatment. Above all it may be a source of pleasure to all of us.

There exists a large group of diseases causing hazards to the poultry keeping. Some of the most common ones are discussed below :

MAREK'S DISEASE (M.D.) and LYMPHOID LEUCOSIS (L.L., Avian leucosis)

These two oncogenic viral diseases are the source of hazards without practically any remedy.

The M.D. is a highly contagious (air-borne) world-wide in distribution, both acute and chronic in nature, lymphoproliferative and degeneration in Bursa of Fabricius and feather follicles, involving gonads, peripheral nerves and C.N.S. caused by DNA virus, Herpes virus B group (M.D.H.V.). It has the incubation period of 2 to 20 weeks. The affected cells are small, medium, and large lymphocytes, plasma cells—dark staining M. D. Cells. Diagnosis done by agar gels precipitation, fluorescent antibody technique (FAT), gross and histopathology, embryo inoculation (stunted growth, pocks on CAM and degeneration in liver and spleen).

Vaccines are widely used in U.S.A. and European countries but not so much in India.

The L.L. is a chronic, lymphoproliferative, world-wide in distribution involving all visceral and neural organs, transmitted mainly through ingestion. It is caused by a RNA type of virus (leucovirus). It has an incubation period of 16 to 32 weeks. The affected cells are predominantly lymphoblasts with variable numbers of small to large lymphocytes. It is negative to agar gel ppt. and F.A.T., does not grow in chick embryo.

Prevention and Control of M.D. and L.L. :

- (1) Birds should always be purchased from a reputed and M.D. free and L.L. free firms.
- (2) If one bird is positive for either of the diseases the whole flock should be segregated immediately and destroyed.

RANIKHET DISEASE

Just a few years back it was the greatest enemy of poultry birds and number one killer. But now it is not at all a problem if routine vaccination is adopted.

Symptoms : The disease is usually seen in three forms :

Peracute form : Birds found dead without any primonitory signs.

Acute form : This form is most common. The disease starts with fever, dullness, loss of appetite, stands in a sleeping posture, Diarrhoea and nasal discharge soon follow. Birds respire with great difficulty with half-opened beak and characteristic crackling sound is remitted. The birds die within 2-3 days.

Chronic form : Chronic cases are invariably characterised with locomotor disturbance in co-ordination of head and neck, paralysis, etc.

Diagnosis : By symptoms, lesions, Haemagglutination Inhibition test, virus neutralisation test, cross immunity test.

Prevention and Control : (1) Vaccination of chicks (1-2 weeks) with F₁ strain F.D.R.D. Vaccine (nasal drop).

(2) Vaccination again at the age of 8-10 weeks with R₂B Freeze dried vaccine.

FOWL POX

It is caused by a DNA type of virus with high mortality in chickens but in adults usually a mild form. It is widespread and the outbreak generally occurs in the months from March to June.

Symptoms : It is manifested in three forms :

- (1) The Cutaneous or Comb form : With wart-like nodules on the comb, wattles, eyelids.
- (2) The Diphtheritic form : With yellowish white diphtheritic membrane on the mucosa of the mouth and larynx.
- (3) The Occulo-nasal form : With catarrhal inflammation of eyes and nostrils. Yellowish cheesy deposits are often observed.

Prevention and Control : (1) Vaccination of adult birds with Fowl Pox Vaccine (CEVL), and laying birds or weak birds and chicks up to 6 weeks with Pigeon Pox Vaccine (PPVL).

COCCIDIOSIS

It is a widely prevalent infectious disease of poultry birds affecting the alimentary tract mainly of chicken and growing stock. Acute infection may cause 100 per cent mortality in young chicks. Infection in older birds is of chronic in nature, which results in anemia, decreased egg production and loss of weight.

Symptoms: The affected chicks are dull and drowsy. They segregate from the flock and become listless to the surroundings. Wings drop and birds often go lame. Diarrhoea supervenes and the faeces are blood tinged.

On opening the carcass the coeca are found swollen with profuse haemorrhages on the mucosal surface. In some cases, particularly adult birds, haemorrhages and inflammations are found in the first part of the intestinal mucosa.

Prevention and Control: (i) To prevent the onset of the disease overcrowding and contamination of food and utensils with faeces must be avoided.

(ii) Chicks should be reared separately from adults, who are carriers.

(iii) Clean, dry and hygienic condition should be maintained.

(iv) Horton and Smith believe that "it is preferable to maintain the resistance of the host group by permitting an ever present low grade infection than to endeavour to prevent infection and thereby retain the susceptibility of host group".

(v) Treatment of affected birds with Codrinal, Sulphamezathine 16 per cent. Sol., Nitrofurazone at the rate of 0.04 to 0.05 per cent., Embazine, Sulmet, etc.

(vi) Some advocate monthly treatment of chicks with 16 per cent. Sulphamezathine or Embazine Solution for three successive days in drinking water.

WORMS OF POULTRY

Poultry birds generally suffer from Round Worm infection, Tape Worm infection and Fluke infection.

Round Worm is very common infection amongst poultry. Heavy infection produce enteritis, haemorrhages and diarrhoea. Birds loose weight, stop or decrease production of eggs.

Deficiency of Vit. A and B make the bird more susceptible to these worms.

Prevention and Control: Monthly deworming should be practised. Examination of stool at randum should also be done from time to time. Ration must be nutritional with various vitamin-supplements.

ECTO-PARASITES

(Ticks, Lice, Mites & Fleas)

The ecto-parasites cause considerable loss due to irritation, skin eruptions, biting and sucking blood. Some of them also transmits pathogenic organisms (e.g., spirochaetis by ticks) to the poultry through their bites. The birds loose condition and their egg production is lowered. Tick paralysis occurs owing to poisonous secretions from salvary gland.

Prevention and Control: Undernourished condition, overcrowding, dark, humid and insanitary conditions are some of the factors which cause growth and multiplication of these ecto-parasites. But even in ideal conditions they are also seen.

Spraying of 2-4 per cent. D.D.T. dust, B.H.C. Powder (1 in 1000 part water or wood ash), Lindane. 33 per cent. sodium fluoride dust are advocated. Painting the perches in the fowl house with tobacco extract containing 40 per cent. nicotine at the rate of 8 oz. per 100 feet may be done.

All hiding places (cracks and crabices) should be removed and sprayed liberally with kerosine, Beygon solution or Tick oil. If the hen houses can be made tight, fumigation with sulphur is useful at the rate of 5 lb. per 100 cft.

BACILLARY WHITE DIARRHOEA (B.W.D.)

(Pullorum Disease)

It is highly fatal, acute contagious disease, particularly of young chicks. Loss due to mortality, lowered egg production and hatchability, etc., is quite substantial.

Adult egg act as carriers and carry infection in their ovaries. Infection may spread through contamination of food, water and litters with infected droppings.

The disease, of course, is not very wide-spread in India.

Prevention and Control: (1) When there is an outbreak, stop hatching, test all birds by a Veterinary Doctor who will advise you to destroy all positive reactors.

(2) Then test all birds at 4-6 weeks interval and be sure that three successive tests failed to detect a positive reactor.

(3) Test birds annually.

(4) Fumigate brooders, equipments. incubator, etc., with formalin.

(5) Treatment though available, is not generally suggested.

DUCK PLAGUE

It is a virulent viral disease affecting ducks with high rate of mortality.

Symptoms: Adults ducks are main victim. First sign is nasal discharge and lachrimation from eyes. It is followed by severing of one or both legs, drooping wings with breast touching the ground. Profuse greenish-white watery diarrhoea starts later on. Eyelids are swollen and sticky in majority of cases. Birds die within 2-4 days.

Prevention and Control: (1) Usual segregation and hygienic measures.

(2) Protection of ducks with Duck Plague Vaccine.

FLOWL TICK FEVER (Spirochaetosis)

It is an acute and very common disease in India. spreads generally, through either bite of ticks or eating of its eggs by the fowl. Infected tick can be infective up to three years under favourable condition. Mosquitoes and other biting flies may also spread the disease.

Symptoms: (i) Intense thirst, high temperature, bluish (cyanosis) head, diarrhoea and depression.

(ii) Loss of appetite, remain aloof from the flock, drooping head, closed eye.

(iii) Greenish-yellow diarrhoea and paralysis.

Prevention and Control: (1) Destroy ticks by spraying DDT, BHC or other insecticides.

(2) Application of boiling water to disinfect cages.

(3) Penicillin (4000 unit per lb. body weight) is quite effective.

(4) Single dose chick embryo spirochaete vaccine provides immunity for one year.

FOWL CHOLERA

It is highly contagious and septicaemic disease of fowl characterised by diarrhoea and high mortality.

Symptoms: (1) In peracute form, at the beginning of the outbreak, sudden death without any premonitory symptoms.

(2) In most cases, however, the birds become dull, tremble in a peculiar gait with heads tucked under wings, they go lame, mucous discharges from the nose and beak.

(3) Diarrhoea soon follows with watery greenish-yellow stool.

(4) Respiratory distress often seen.

Prevention and Control: (1) Birds can be treated with 16 per cent. Sulphamexathine Soln.

(2) Broth vaccine (which is available) seems to exert a very short durable immunity. Yet it should be used.

INFECTIOUS LARYNGOTRACHEITIS (I.L.T.) AND INFECTIOUS BRONCHITIS

Both the diseases affect respiratory system of poultry birds and are viral disease.

The former is predominantly a disease of nature birds and the latter is mostly seen amongst brooder chicks.

Symptoms: Gasping, coughing, sneezing, discharges from the eyes and nose and bluish comb are some of the most recognised symptoms noticed in both the diseases. A sizable number of birds die in these diseases.

Treatment: Ampicillin, Kennamycin and Erythromycin may be tried for medicinal treatment.

CHRONIC RESPIRATORY DISEASE (C.R.D.)

This is a chronic disease of fowls, specially of young birds. It causes considerable financial loss by decreased egg production and retarded growth.

Etiology: Some workers believe that a virus and Mycoplasma gallisepticum (PPLO) may conjointly precipitate the disease. Others believe that in fowls uncomplicated cases of C. R. D. and Infectious Sinusitis in turkeys are caused by M. gallisepticum. Stress and other predisposing factors (overcrowding, exposure to uncongenial atmosphere, vaccination against Pox or R.D. malnutrition, etc.) often precipitates the disease.

Symptoms: The main symptoms consist of rales, nasal discharge, coughing, sneezing, gasping, decreased egg production and poor weight gain. The disease spreads slowly and the duration is long, 3 weeks to 2 months.

Prevention and Control: Mycoplasmas are insensitive to sulphonamides and penicillin but sensitive to chloramphenicol, tetracycline, Neomycin, Kanamycin and Erythromycin.

Avoid overcrowding and other stress conditions.

Therefore, to minimise the occurrence of poultry diseases, and to rear the birds in a more economic way the following measures should be adopted :

- (1) Poultry houses should be constructed in a dry and well ventilated place.
- (2) Stock of birds should be procured from a reputed and disease-free firm.
- (3) Observe strict sanitary and hygienic condition in the poultry houses, attendants as well as for the visitors.
- (4) While purchasing new birds they should always be kept for observation for 2 weeks in a separate house before mixing with the old stock.
- (5) Chicks and adult birds should be raised separately.
- (6) If the bird dies take it to the nearest Veterinary Centre for thorough investigation of the disease.
- (7) Anthelmintic drugs should be administered in a particular date, in every month.
- (8) Make the poultry house tick free by spraying insecticides, along with the birds.
- (9) Vaccination against Ranikhet Disease, Fowl Pox and Fowl Cholera should be done.
- (10) Supply adequately balanced ration and plenty of clean drinking water.
- (11) Contact nearest Veterinary Doctor for better advice and protection of your birds.



Bird's eye view of Haringhata Dairy

"Modern Dairy Farming is recent in origin. The Dairy Industry embraces the production of milk and its preparation for sale as well as distribution and manufacture of dairy products."

3

DAIRY DEVELOPMENT

Greater Calcutta Milk Supply Scheme

The Urban Milk Supply Schemes in the Public Sector came up with two broad objectives—(i) to provide marketing facilities to the rural producers of milk for disposing of their marketable surplus and (ii) to supply pasteurised milk to the urban population at a reasonable price. With this broad objectives a dairy plant was installed at Haringhata and the same started functioning in June, 1950. A scheme for construction of milk colonies for colonisation of cattle was also introduced in the year 1954 and the first set of milk colonies was ready for occupation by cattle in the year 1957. The second dairy plant was set up at Belgachia, Calcutta, in the year 1962. A net work of chilling stations has also been gradually built up since 1952. The Greater Calcutta Milk Supply Scheme now functions with two Dairy Plants, seven Milk Colony Units and 19 Milk Collection-cum-Chilling Stations.

When the first dairy plant was set up at Haringhata in 1950-51 it started with the production of 1.5 thousand litres bottled milk per day, whereas at the

present moment the Dairy production has gone up to 210.00 thousand litres. Beside production of liquid milk the G.C.M.S.S. also produces ghee when the surplus butter fat is available. The achievements of G.C.M.S.S. during last four years may be summarised as below:

Year		Number of C.P.s	Total procurement of fresh milk per day on an average (in lakh kg.)
1971-72	..	17	0.38
1972-73	..	17	0.47
1973-74	..	19	0.68
1974-75	..	19	0.69

Year	Number of Milk Booths	Total sale of milk per day on an average (lakh lit.)	Sale of Ghee during the year (Kg.)
1971-72 ..	593	1.36	21,700
1972-73 ..	593	1.62	73,400
1973-74 ..	625	1.83	60,600
1974-75 ..	626	1.81	20,200

In order to increase the handling capacities of milk of the dairy plant at Belgachia (Central Dairy Factory) a programme was undertaken for raising the level of production up to 3.00 lakh litres of processed milk a day. The expansion work is nearing completion. With the installation of additional plants under expansion programme a scheme has now been formulated to increase the output in a phased manner (5,000 litres per day in every month) so that we may reach the installed capacity of two dairies, i.e., 350 lakh litres per day (installed capacity of Central Dairy and Haringhata Factory taken together) by the end of 1978-79. Meanwhile, the production has been increased to 2.10 lakh litres per day in the process of implementation of the scheme for increasing the daily output of processed milk in a phased manner.

The G.C.M.S.S. has provided direct employment to a very large number of staff and workers (including daily paid workers) of this State. The strength of staff and workers borne on the establishment of G.C.M.S.S. during last four years vis-a-vis the annual increase in the strength is as follows :

Year	Number of staff and worker	Annual increase
1971-72 .. (as in April 1971)	4,540	..
1972-73 .. (as in April 1972)	4,896	356
1973-74 .. (as in April 1973)	5,395	499
1974-75 .. (as in April 1974)	5,791	396

Beside full-time employment, the G.C.M.S.S. also offers part-time employment to girl students to help them defray their educational expenses. With the increase in output the number of Milk Booths will increase proportionately and the part-time employment potentiality shall also increase. At the present moment the number of part-time employees is over 2,000. When the dairy output will be around 3.50 lakh litres the part-time employment potentiality will also rise at least by 50 per cent.

A portion of the processed milk of Haringhata Dairy is also being sold to the consumers through the unemployed youth as a measure of providing them with partial employment. At present 10,000 litres of milk is being sold to the people of Santipur, Ranaghat and Krishnanagore townships under this programme.

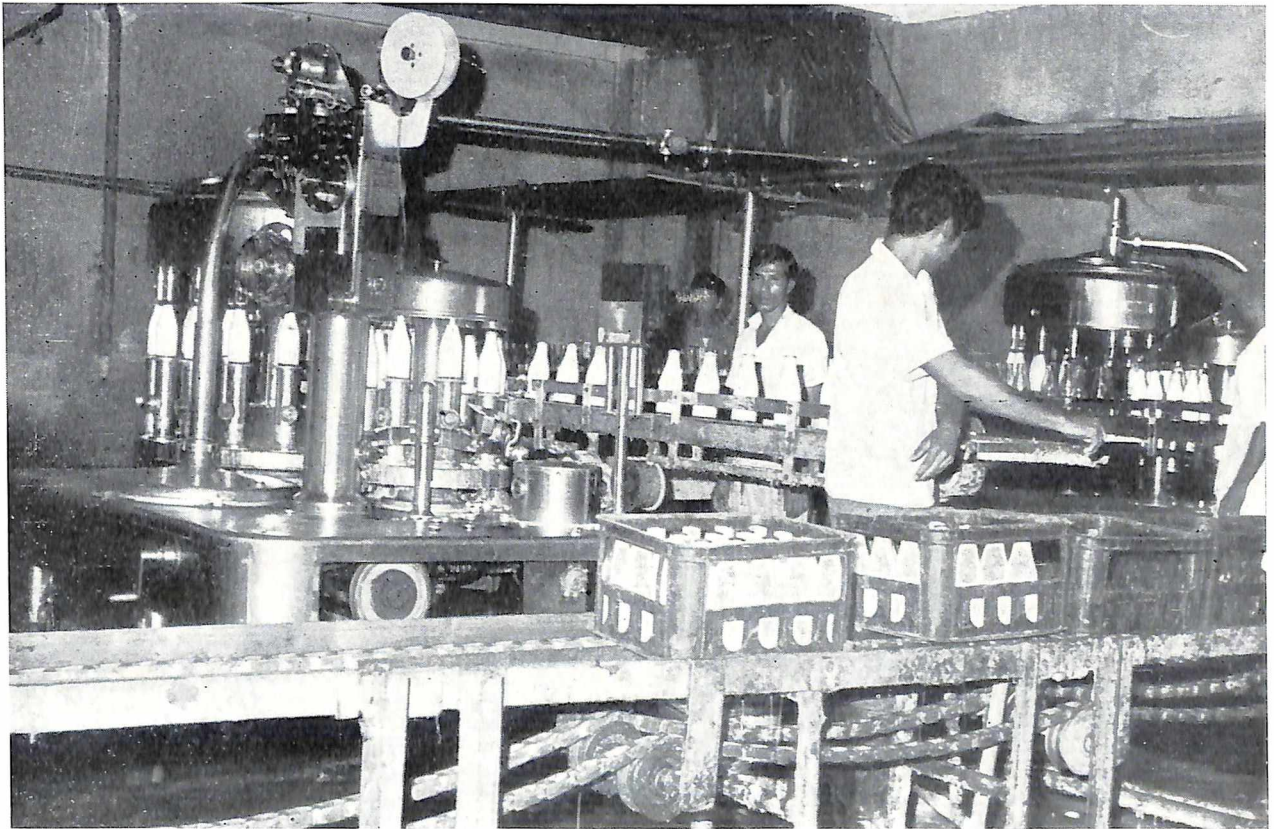
The greatest achievement of the G.C.M.S.S. lies in its commendable role to check the selling price of milk of the metropolitan city to the maximum relief to the consumers particularly to those belonging to the low-income group. Had there been no machinery in the public sector to supply milk to a vast number of consumers the price of milk in the open market would have been further increased and the sufferings of the common people aggravated. When the dairy industry in the public sector will be properly strengthened and its production capacity sufficiently increased it will be in a position to exercise adequate control on the price of milk in the open market. The days are not far off when the dairies in the public sector will be in a position to discharge its social responsibilities squarely by increasing its output and extending its activities to different urban areas of this State. The following photographs given an idea of the different aspects of the Greater Calcutta Milk Supply Scheme:



Front view of Central Dairy, Calcutta



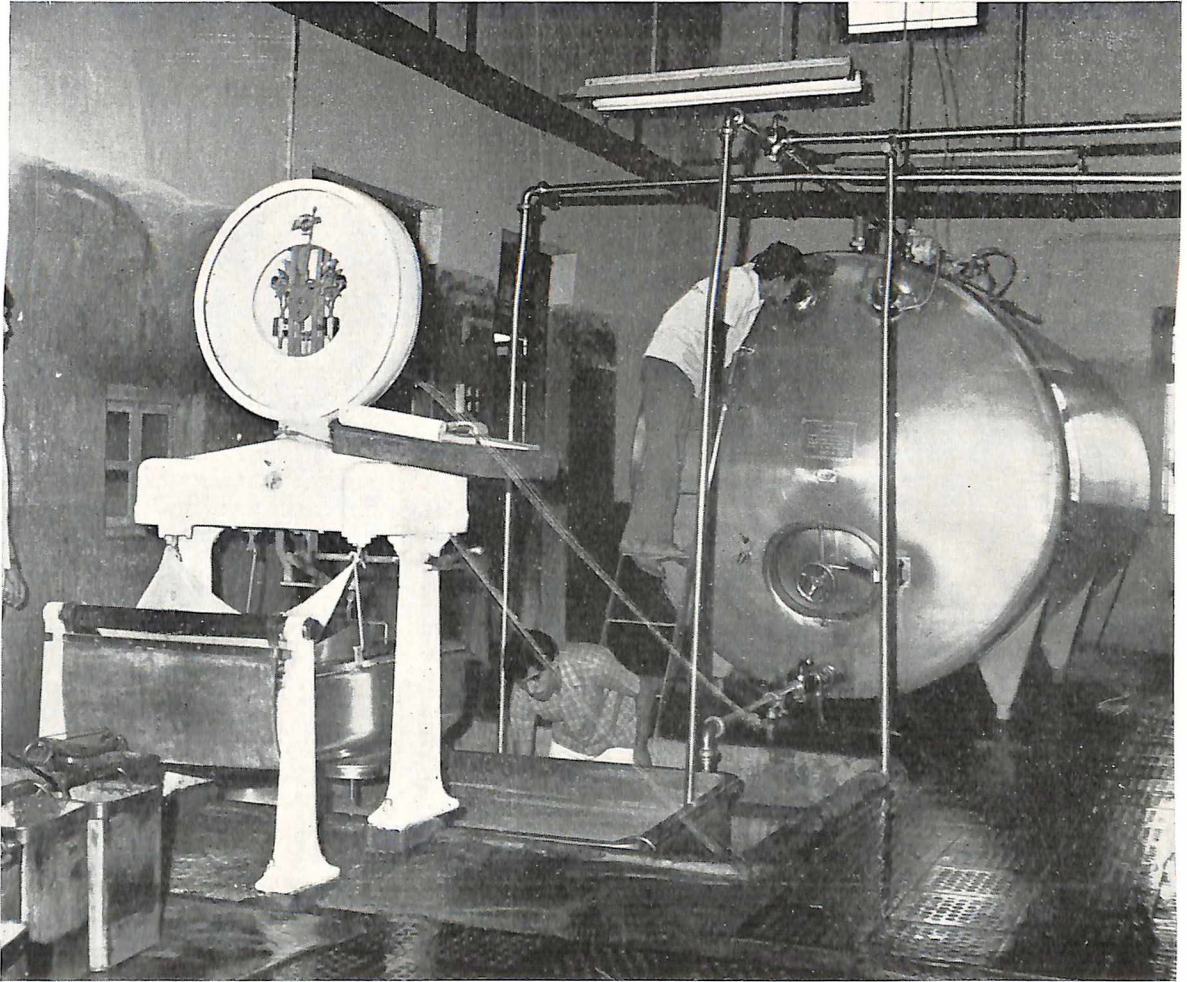
Milk can washing operation in Fulia Milk Chilling Plant



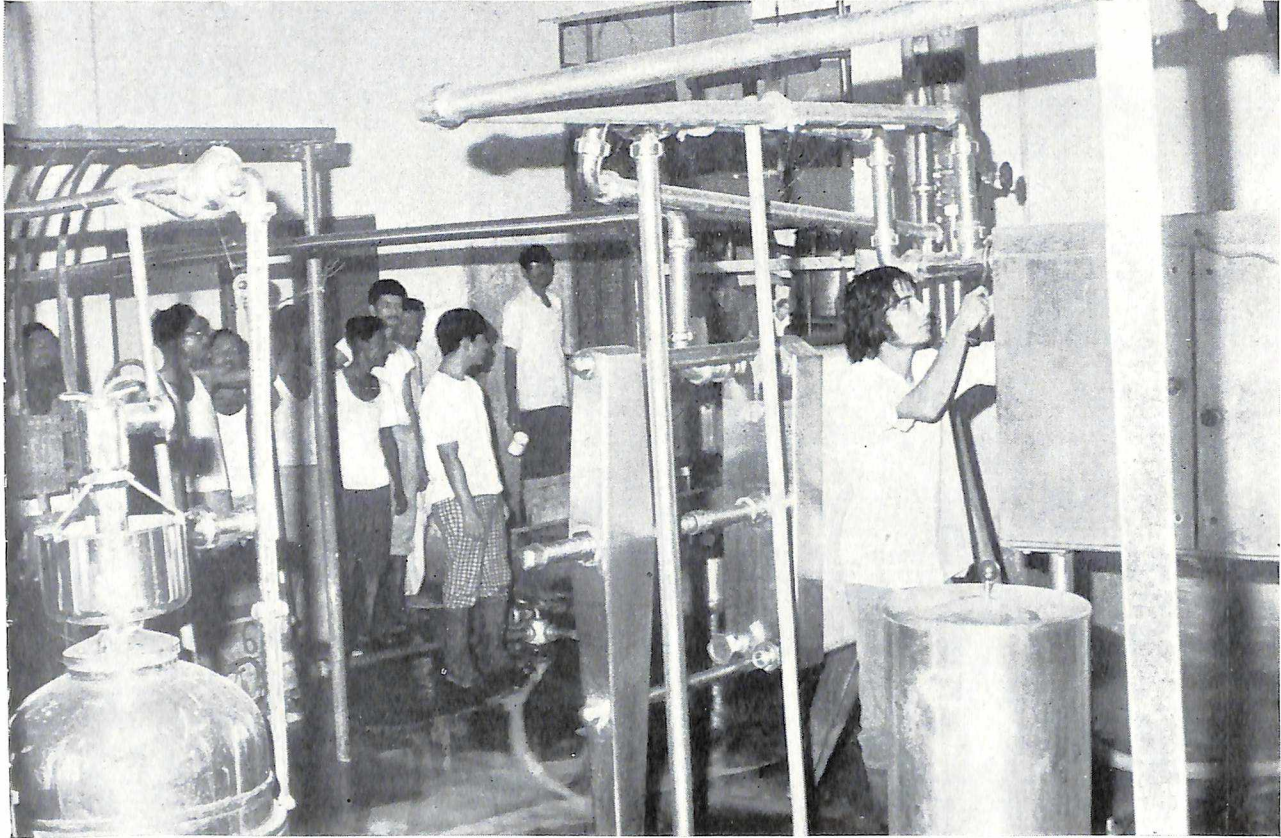
Bottling operation in progress at Central Dairy



Milk being delivered at a Milk Booth in Calcutta



Inside view of Fulia Chilling Plant showing Weighing Bowl and Storage Tank



Pasteurisation operation in progress at Haringhata Dairy



Depot Girls distributing milk from a Milk Booth in Calcutta

A queue of customers before a Heem Cream (Ice Cream) Stall on a Calcutta Street





Sale of Heem Cream, Chocolate Milk and Ghee are in progress



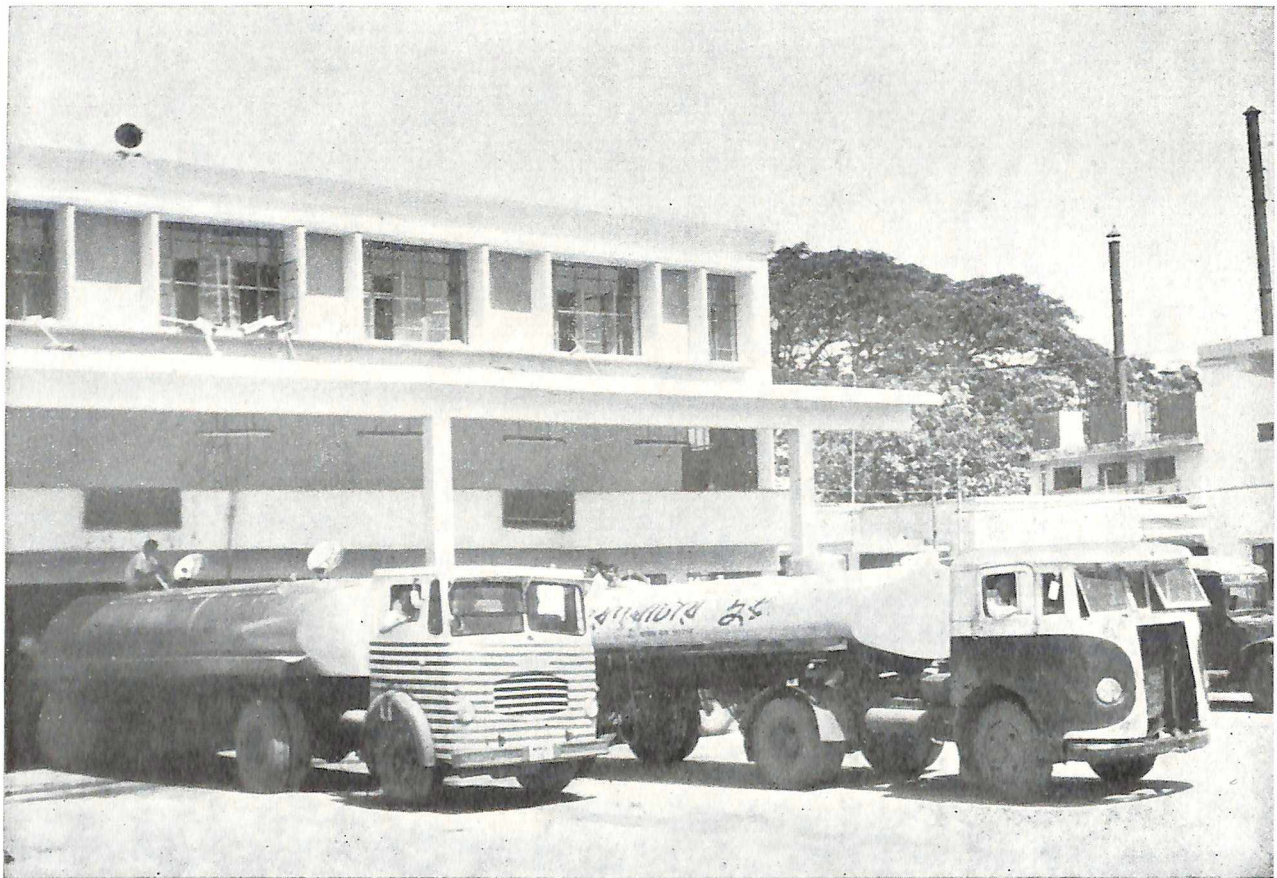
Customers receiving milk from a Milk Booth in Greater Calcutta Area



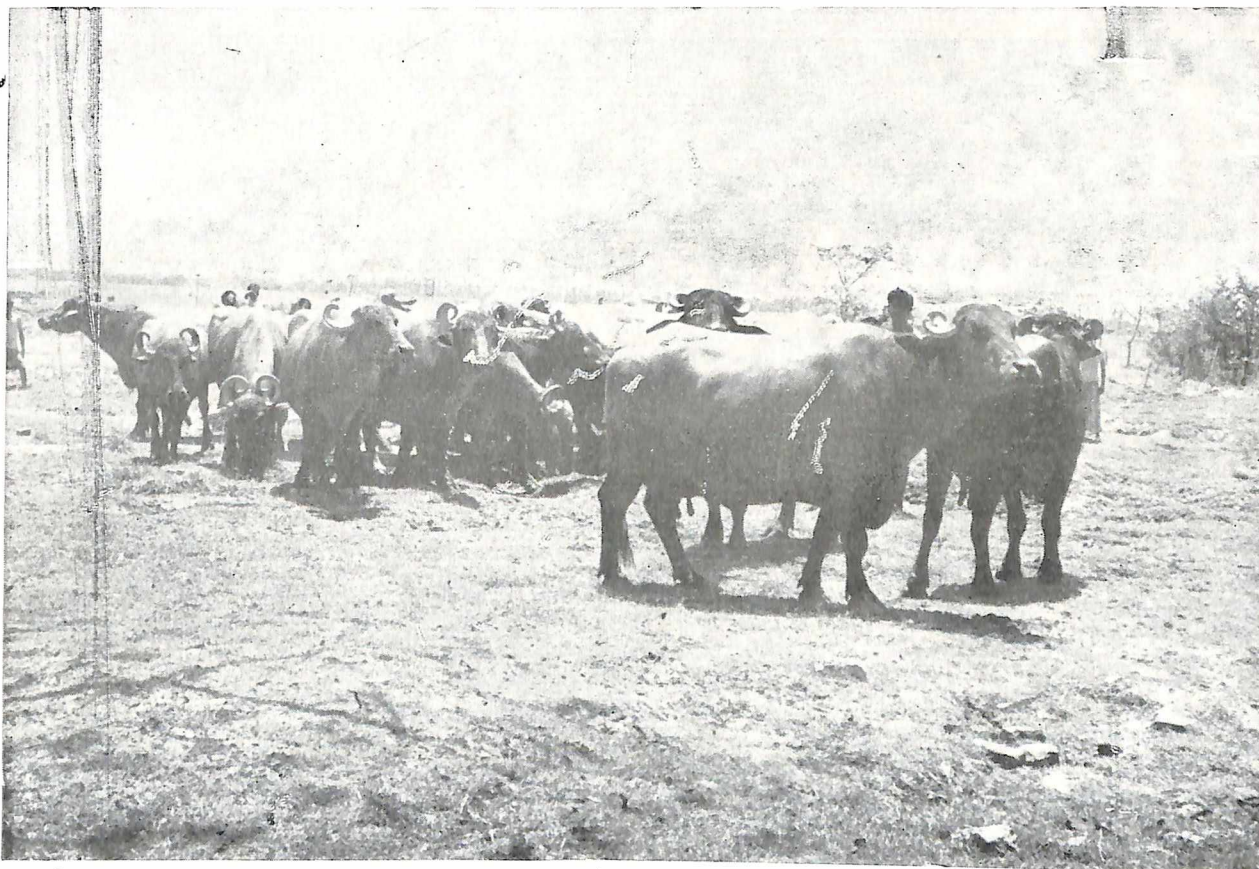
Receiving milk from a Milk Booth



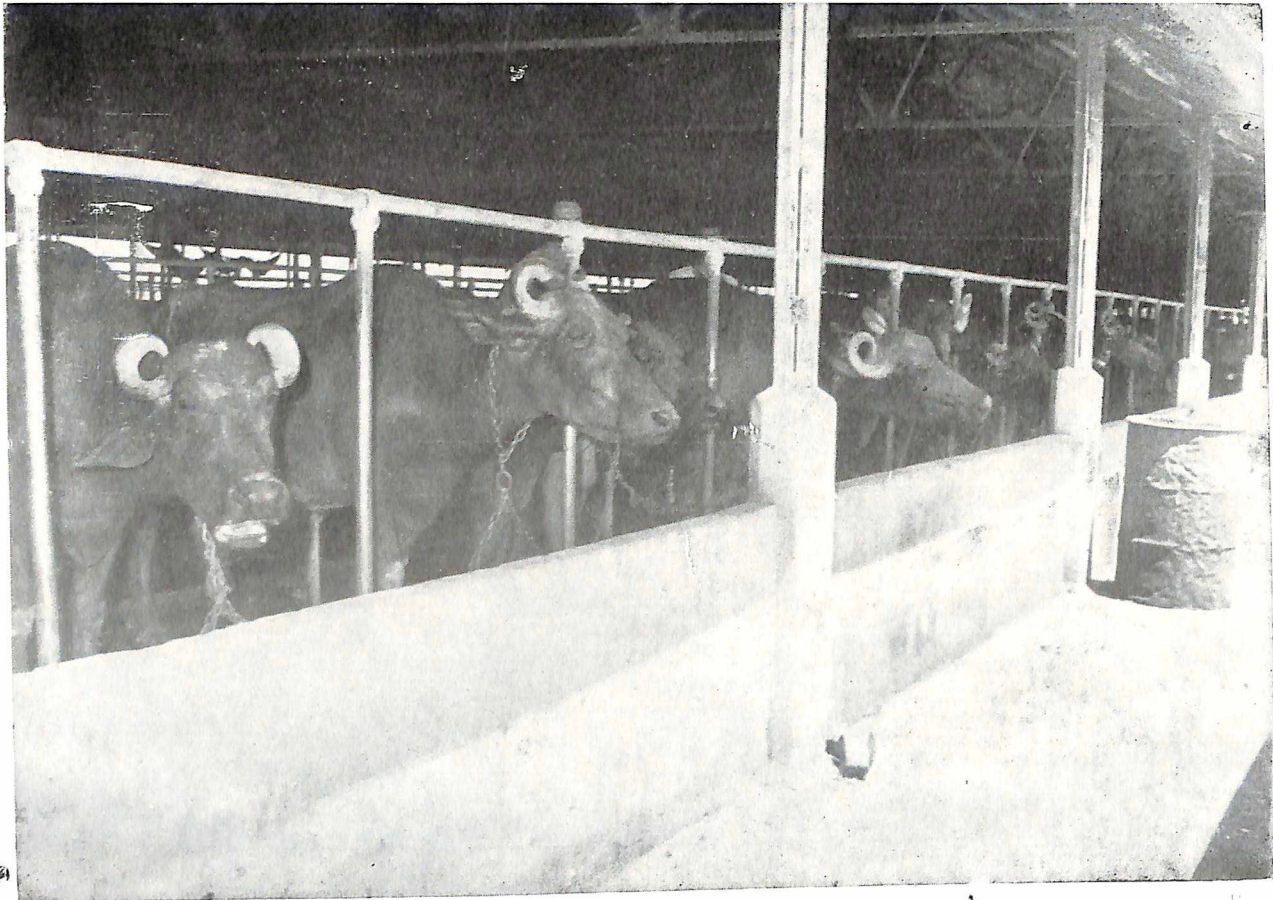
The Mobile Milk Bar—The customers are seen inside the Milk Bar



New Milk Reception Wing at Haringhata Dairy



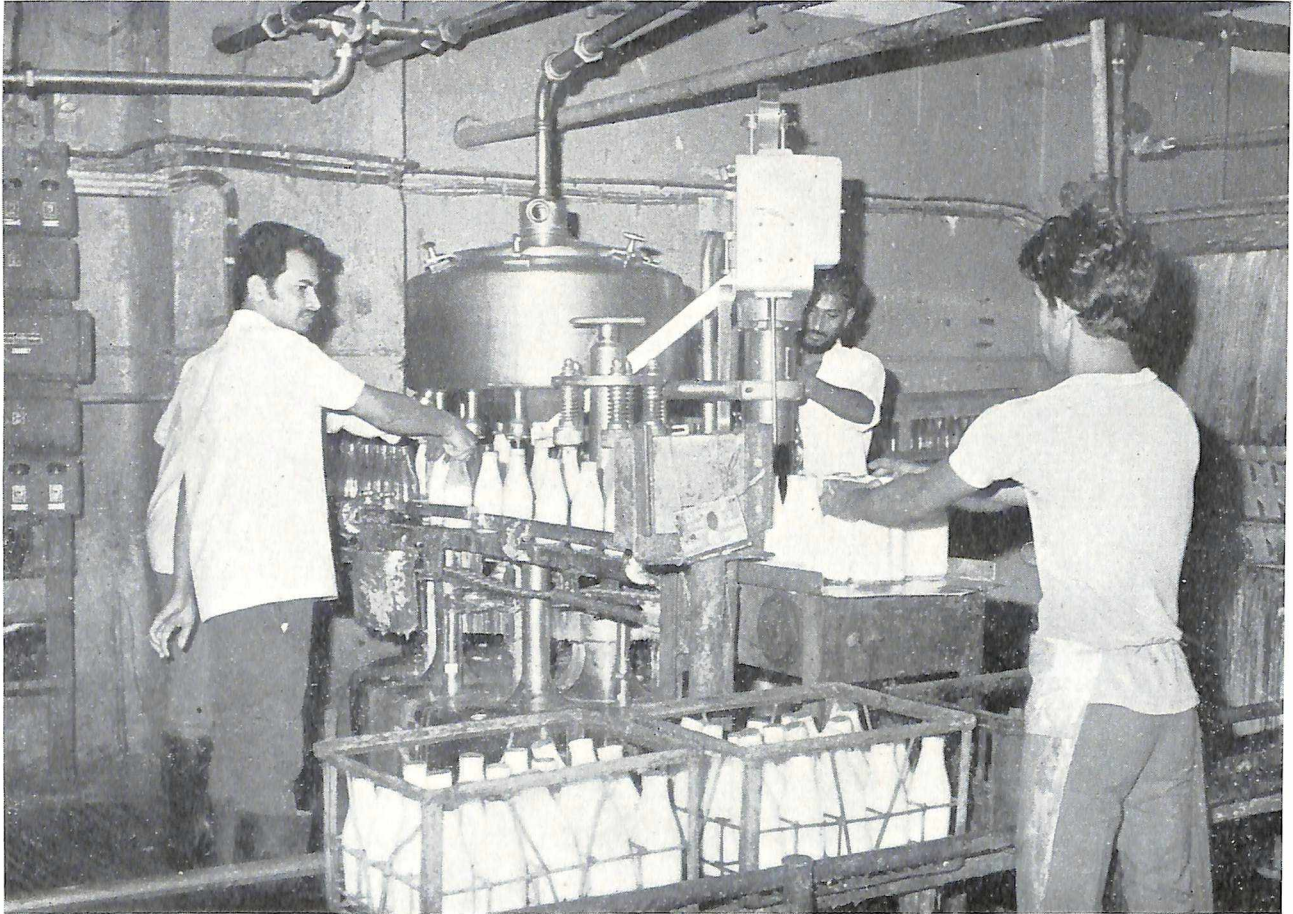
Private Licensees' buffaloes in the Haringhata Milk Colony



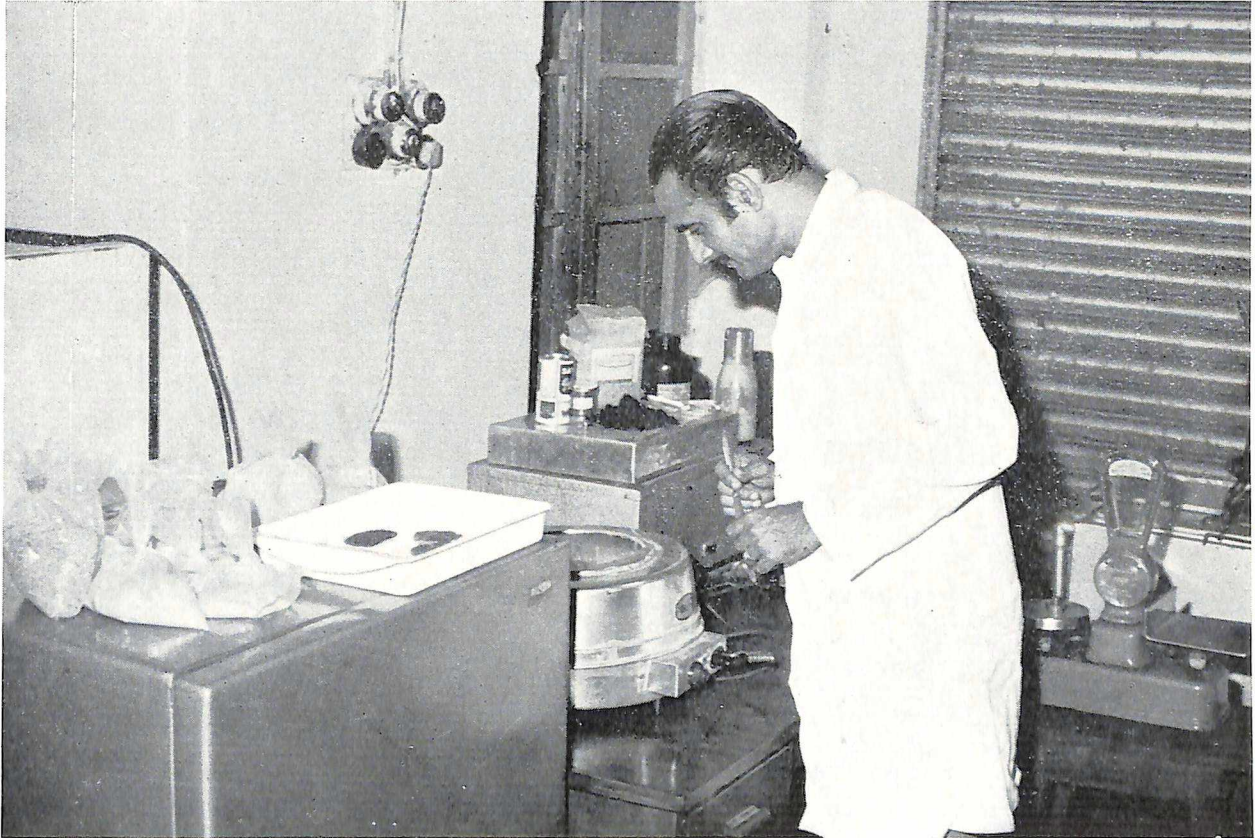
Milking Sheds in the Haringhata Milk Colony



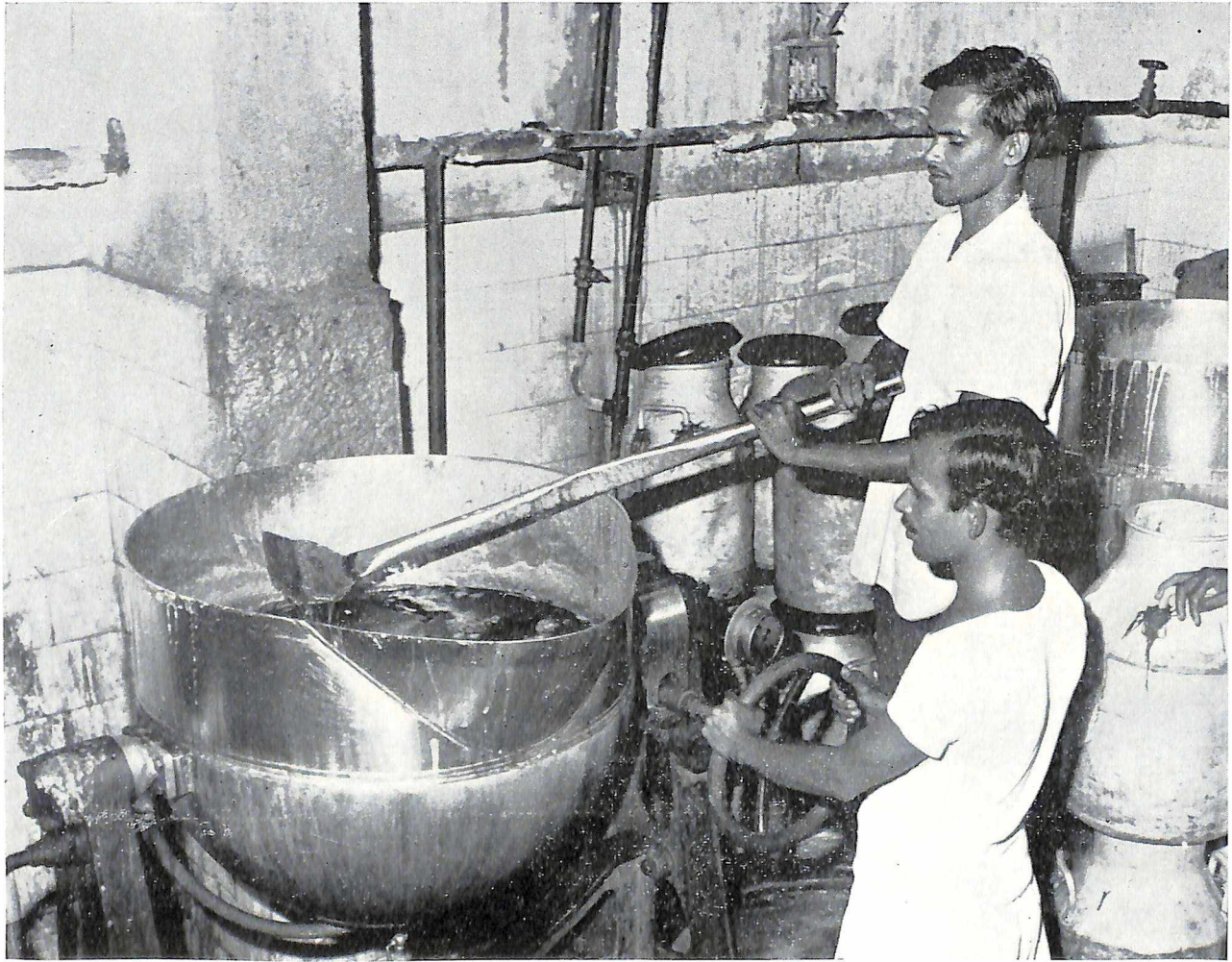
Reserve stock of paddy straw in Haringhata Milk Colony



Bottle filling operation is in progress at Haringhata Dairy



Laboratory trials for manufacture of Casein, biscuits, chocolates, etc., from sub-standard|surplus milk at Haringhata



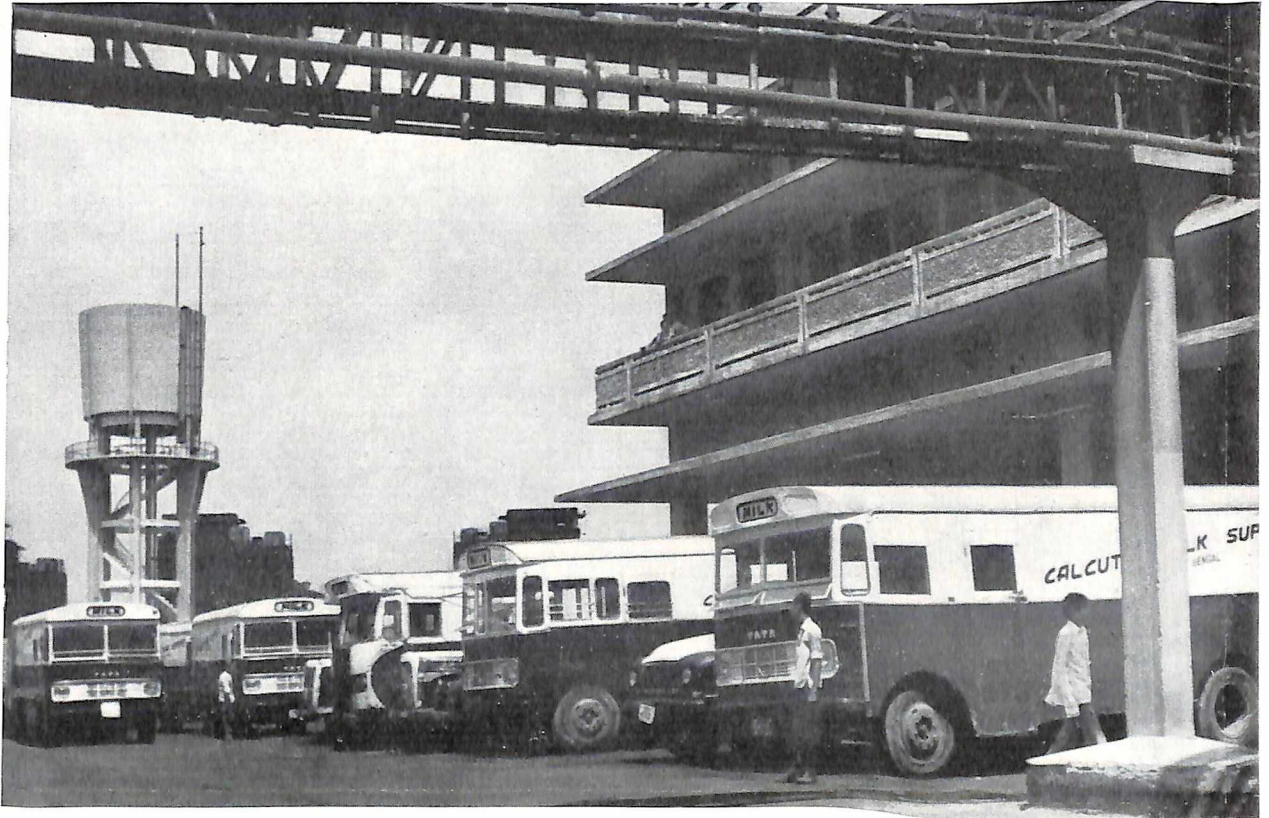
Ghee-making is in progress at Haringhata Dairy



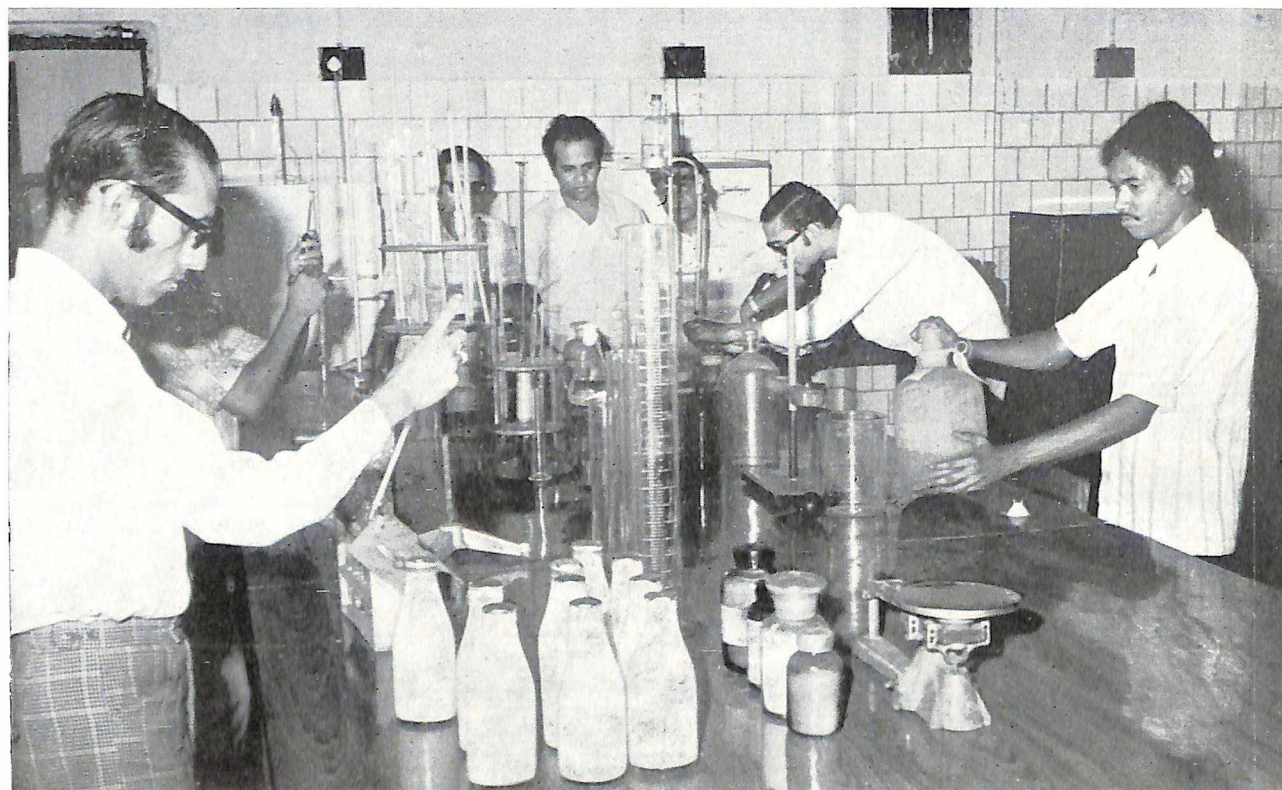
Ghee-filling and sealing in progress at Haringhata Dairy



Rural milk suppliers—in the backdrop of Fulia Milk Chilling Plant



Milk Vans at the unloading dock at Central Dairy

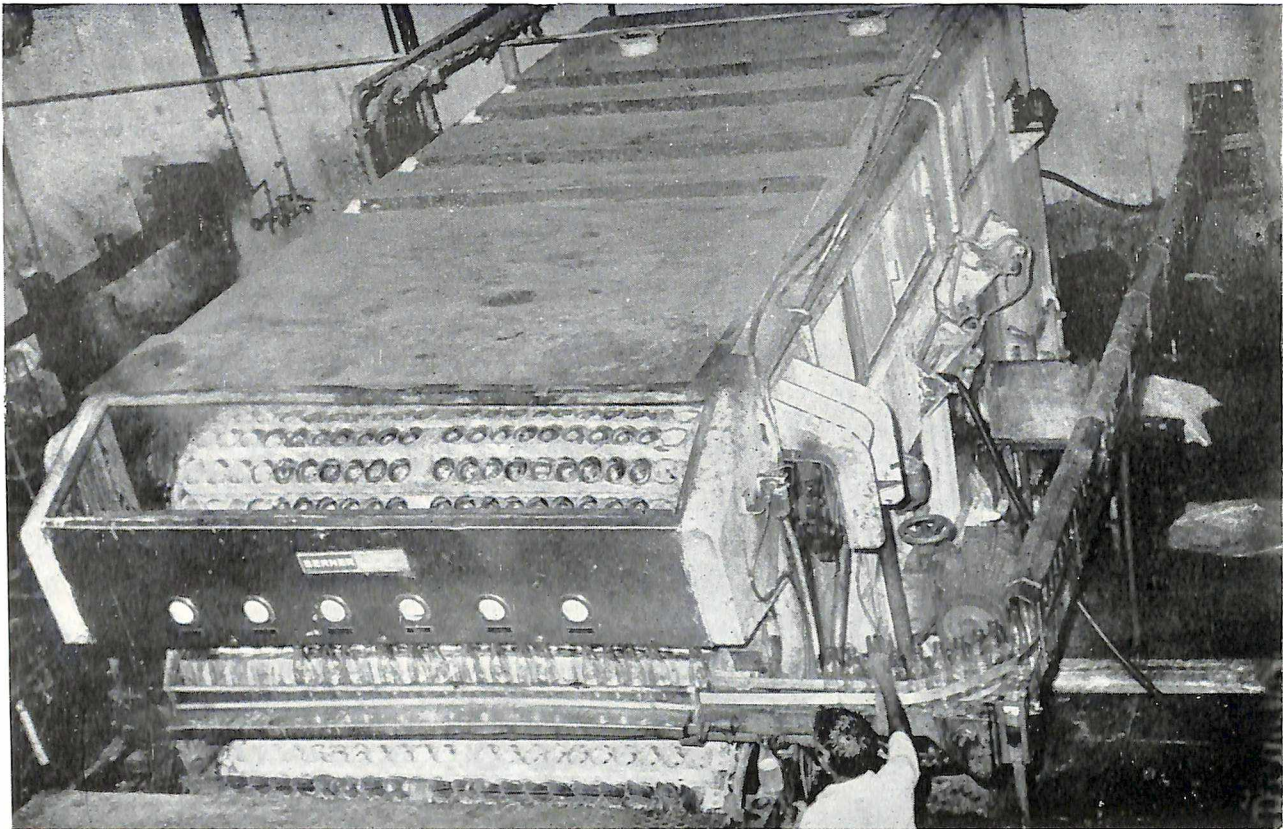


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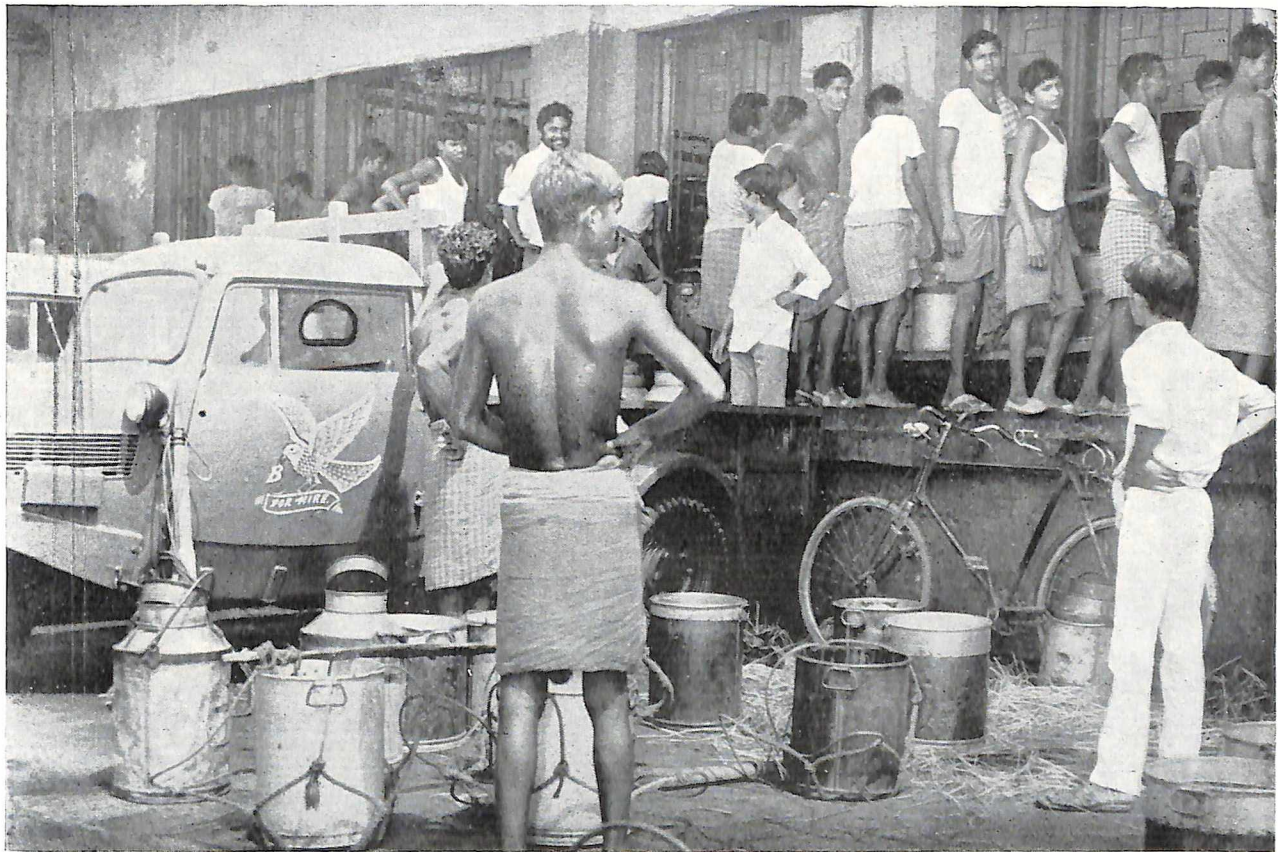
Milk Testing Room at Central Dairy



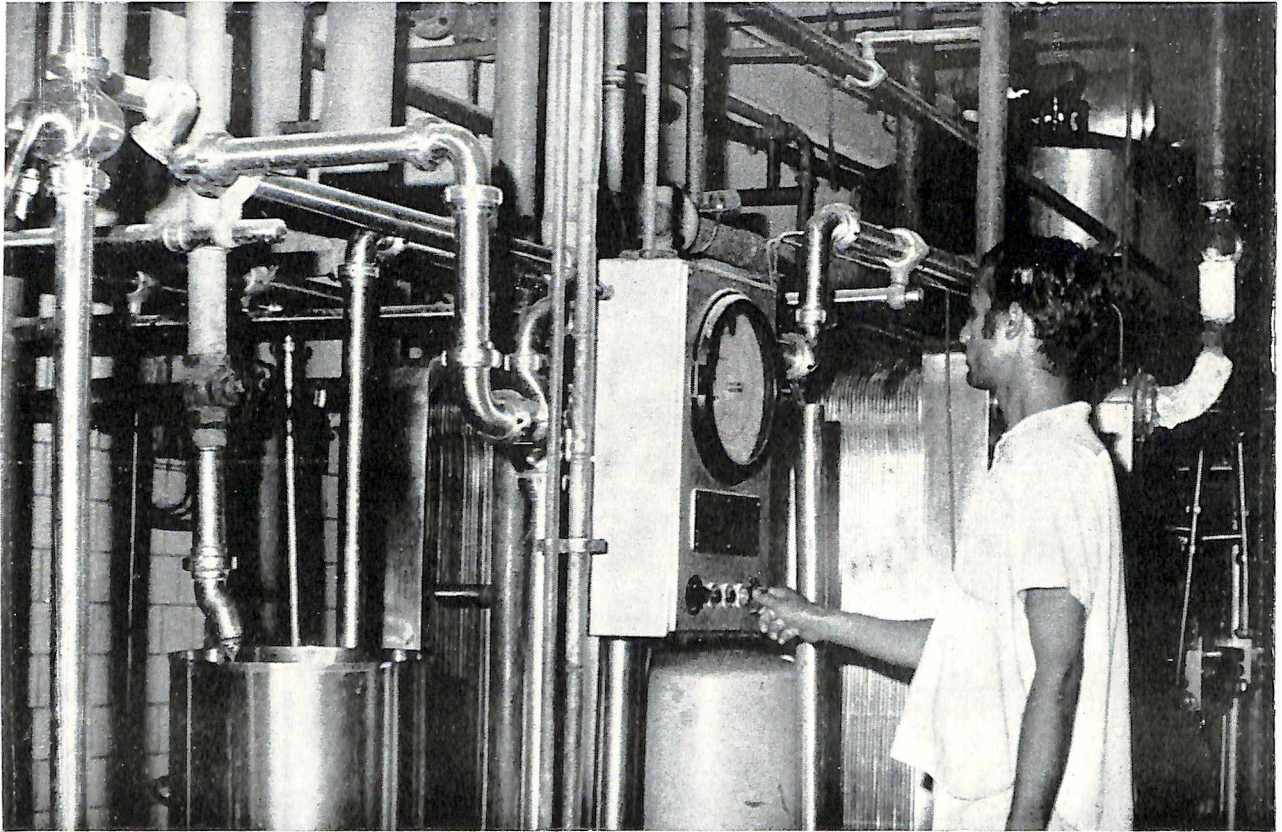
Milk Cold Store at Central Dairy



Bottle Washing Machine at Central Dairy



Suppliers queuing up to deliver milk at Central Dairy



A scene from Processing Room at Central Dairy

durgapur milk supply scheme

A Dairy Plant was set up at Durgapur to meet the demand for fluid milk of the people of Durgapur township, Ranigunge and Asansol industrial complex. The plant has capacity of process 50,000 lits. of milk and manufacture 1,200 lits. of ice-cream per day. The dairy was commissioned in October 1972 with the programme to process 20,000 lits. of milk per day in the first phase and ice-cream during summer in keeping with the demands for ice-cream in the consumers' market. Though the programme was to process 20,000 lits. of milk per day the actual production is still far behind the target set.

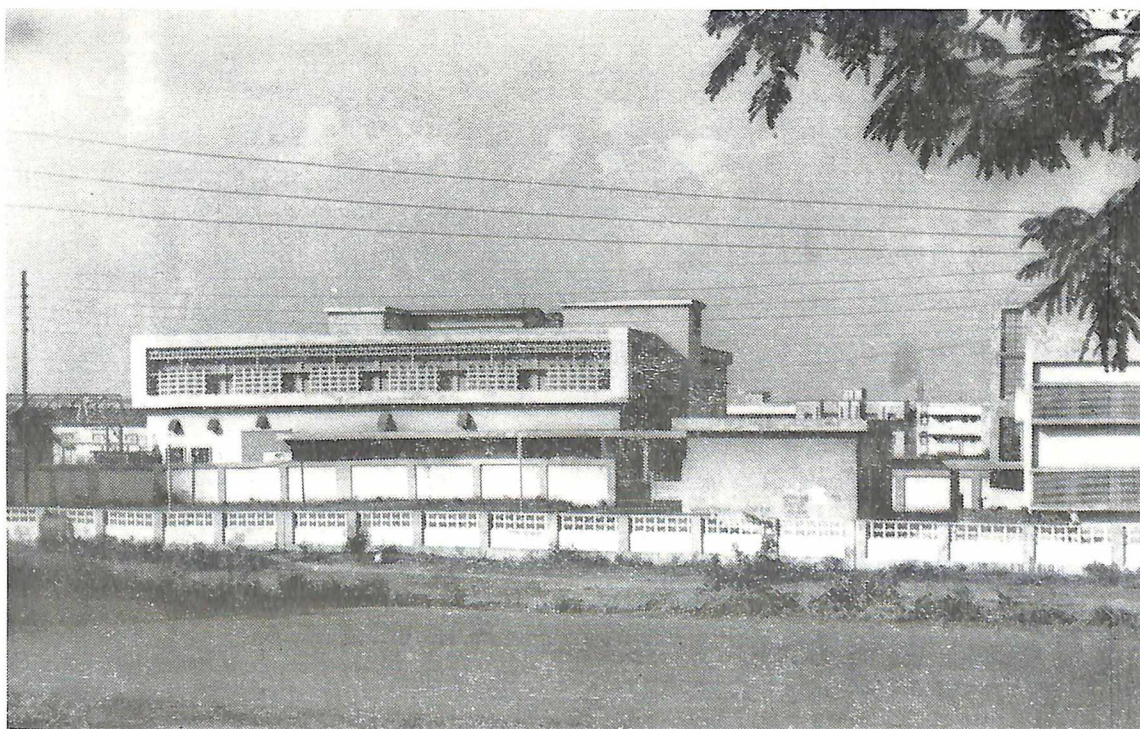
To feed the dairy plant at Durgapur with fresh milk two Milk Collection-cum-Chilling Stations have been set up in Vishnupur and Sonamukhi in the district of Bankura. More chilling plants are going to be set up in the districts of Burdwan and Birbhum to collect fresh milk and supply it to dairy at Durgapur. The procurement of milk and the

production of bott'ed milk per day on an average during last three years was as follows :

Year	Number of Chilling Stations	Quantity of milk procured per day on an average (Kg.)	Quantity of milk sold per day as on an average (Lits.)
1972-73 ..	2	3,150	3,000
1973-74 ..	2	7,360	10,000
1974-75 ..	2	7,480	10,000

In Durgapur Milk Supply Scheme we have no machinery of our own to sell milk direct to the consumers. Here the milk is sold to the Agents and the Agents supply the milk to the consumers. This selling arrangement has offered indirect employment to the unemployed youth of the township. When more milk is produced it will be possible to give indirect employment to a greater number of unemployed youth of the locality.

The Durgapur Milk Supply Scheme has now a total strength of 315 staff and workers. When the output of the Dairy Plant will surpass 20,000 lits. a day, the employment potentiality will also increase. Steps are being considered to increase both procurement and sale of milk within the earliest possible time.



Durgapur
Dairy
Plant :

Mother Dairy at Dankuni

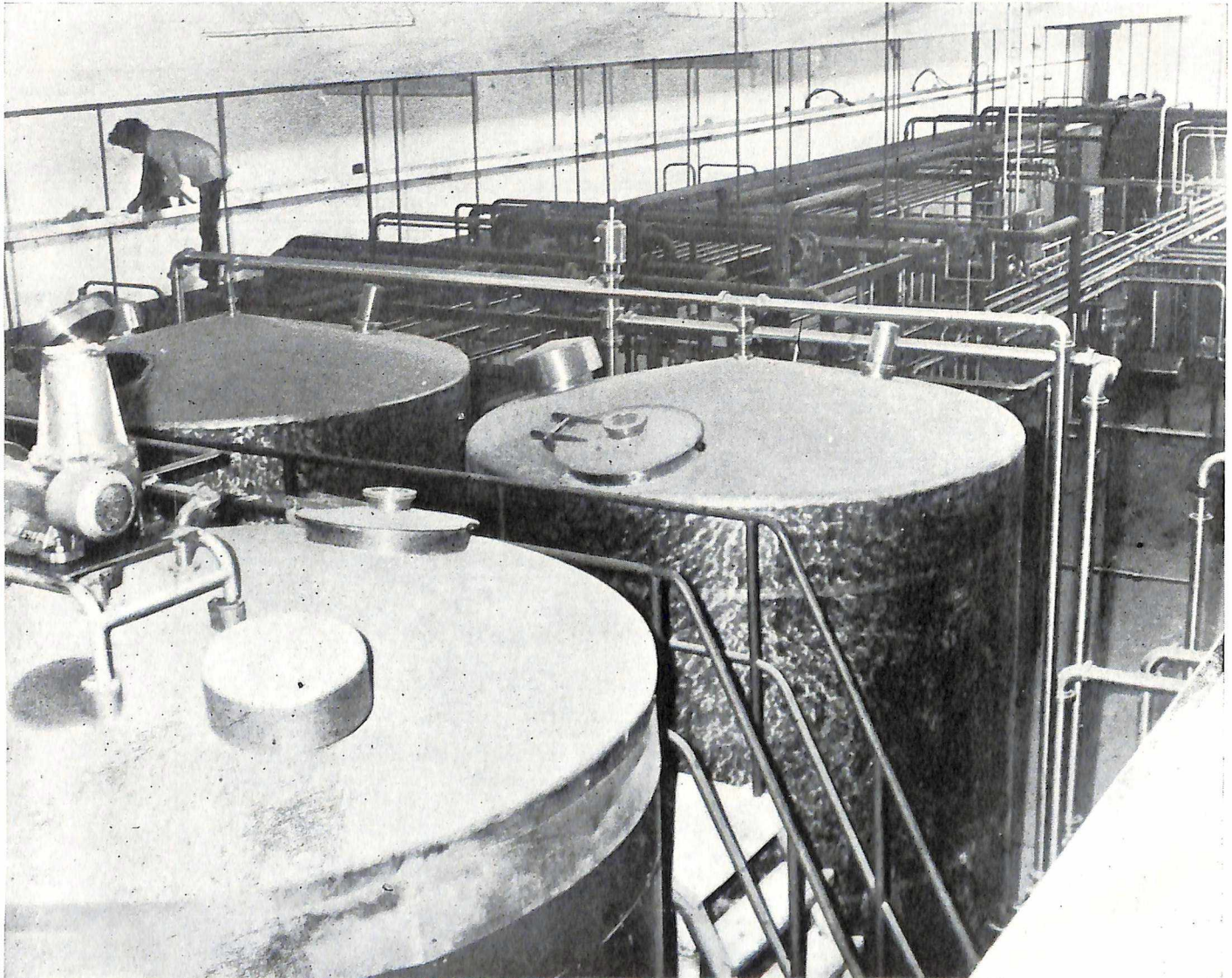
The demand for milk in Calcutta is increasing day by day with the increase in the population. It has been estimated that the economic demand for milk in 1974 was 5.72 lakh litres for Calcutta and 12.81 lakh litres for Greater Calcutta areas.

To meet this demand one more large dairy at Dankuni is being established at 21 km. north-west of Calcutta in the district of Hooghly with the assistance obtained under W.F.P.-618.

With the commissioning of this Dairy the total supply of milk in Greater Calcutta will be as follows :

Haringhata Dairy ..	50,000 lits.
Central Dairy ..	3,00,000 lits.
Dankuni Dairy ..	4,00,000 lits.
Total ..	7,50,000 lits.

With the regular supply hand at 50 per cent demand for milk in Greater Calcutta will be met. The photo below shows how Dankuni Project is coming up :



Dankuni Project



Matigara Dairy Godown

Multipurpose Dairy at Matigara

A Dairy Plant is being set up at Matigara, Darjeeling, with a capacity to produce 5,400 kg. of S.M.P., 1,500 kg. of butter and 4,000 lits. of processed milk per day. While the processed milk will be sold mainly to the people of Siliguri township, the Skimmed Milk Powder and butter will be sold to other State dairies for production of

reconstituted milk. The construction and installation work of the Dairy is nearing completion. It is expected that the plant will be ready for commissioning within a few months.

This feeder-cum-balancing dairy will provide a ready market for fresh milk produced in milk-shed rural areas in Darjeeling district and stimulate the rural economy to a good extent. The milk process-

Some important Dairy Development Programmes included in the Fifth Plan Proposals

During the Fifth Plan proposal, many development schemes including two new milk supply schemes and one product factory were taken up. The annual development programmes includes expansion and consolidation of the capacity of existing Dairy Plants, housing facilities for officers and staff of the Multipurpose Dairy at Matigara and Mother Dairy at 'Dankuni', training of technical personnel at various training courses conducted by the Institutions like N.D.R.I., I.V.R.I., etc., creation of a staff set up for the implementation of the project, research work on economic utilisation of surplus/substandard milk, advancing of loans for aiding milk production, formation of milk co-operatives and rural dairy extension, etc. The basic objectives of each plan scheme is mentioned below scheme-wise.

(i) Expansion and consolidation of dairies at Haringhata and Belgachia

The programme envisages the expansion and renovation of the dairy at Haringhata to equip it for processing and bottling 50,000 lits. of milk per day; completion of civil works connected with the expansion of the Central Dairy, Belgachia, to equip it to process and bottle 3.00 lakh lits. of milk per day and procure required number of vehicles to handle larger volume of milk as per expanded capacity of the Central Dairy Factory at Belgachia. The estimated expenditure under this project during the Fifth Plan period amounts to Rs. 65.00 lakhs.

(ii) Expansion and Consolidation of Dairy at Durgapur

The programme envisages the construction of 98 flats for providing residential quarters to the officers and staff working at the State Dairy, Durgapur. The estimate of expenditure as tentatively agreed to by the working group of the Planning Commission for the Fifth Plan period amounts to Rs. 50.00 lakhs.

(iii) Rural Dairy Extension

To set up a good net-work of milk collection-cum-chilling station in the milk shed rural areas, phase by phase, the programme envisages the establishment of 30 milk collection-cum-chilling stations within the Fifth Plan period. The total outlay tentatively approved by the working group of the Planning Commission for this project during the Fifth Plan period amounts to Rs. 50.00 lakhs.

(iv) Long-distance transport

To create a fleet of vehicles for transport of milk from the remote rural areas, it has been necessary to procure vehicles and engage them in transporting milk from remote rural areas. The tentative outlay for this project during Fifth Plan period amounts to Rs. 20.00 lakhs.

(v) Krishnagore Milk Supply Scheme

A Dairy Plant with a capacity to handle 20,000 lits. of liquid milk will be set up at Krishnagore. The scheme will supply bottled milk at Krishnagore, Ranaghat and Santipur townships in the district of Nadia. The tentative outlay for this project during Fifth Plan period amounts to Rs. 50.00 lakhs.

(vi) Burdwan Milk Supply Scheme

A Dairy Plant with a capacity to handle 20,000 lits. of liquid milk will be set up in the district of Burdwan to meet the demands for fluid milk in the township and its adjoining areas. The tentative outlay for this project during Fifth Plan period amounts to Rs. 50.00 lakhs.

(vii) Milk Product Factory (Ice-cream factory at Salt Lake, Calcutta)

A product factory with capacity of manufacturing 2,000 lits. of Ice-cream per day along with plants for production of chocolate milk and ghee, etc., will be set up at Salt Lake, Calcutta. A plot of land for setting up the plants has been allotted by the Irrigation Department of this Government. The salamies for lease-hold land has been paid and the possession taken. The tentative outlay for this project during the Fifth Plan period amounts to Rs. 40.00 lakhs.

CLEAN MILK PRODUCTION AND ITS IMPORTANCE

Introduction

Milk has correctly been described as "Life in the liquid form". It is the baby's first food after it has seen the light of this world. All the nutrients required for the proper development of our body are present in milk. The milk protein has high biological value having all the essential amino acids in sufficient quantities along with fat, carbohydrates, vitamins and mineral salts and as such it is Nature's most complete food. Infants and aged/ailing people find milk as their staple food. Hence the importance of clean and wholesome milk needs no further introduction.

Clean milk production, why?

The problem, however, is how to get clean and wholesome milk and in sufficient quantities. This is required for hygienic point of view as quite a number of diseases have milk as their origin. Milk as we know is an ideal food for bacteria and a good medium for their growth. The part played by bacteria in relation to milk supply is to be understood by all consumers for better appreciation of the milk supply problems. The bacteria have a destructive as well as a desirable role to play in the Dairy Industry. The spoilage of milk in the dairy plants is due to result of bacteria activity. Side by side a desirable role of bacteria we notice in the preparation of 'dahi' and other fermented milk products which are produced by initiating desirable bacterial growth in milk.

Milk curdles because of development of acidity in milk which is the results of metabolic products of bacterial growth. All tropical climate is good for rapid bacterial multiplication and all efforts therefore should be directed to restrict the number of bacteria in milk. Hence the need for clean milk production is so vital for Dairy Industry.

Produce clean milk

Bacteria are tiny vegetative cells which multiply quickly. They find their entry into milk from different sources and at different stages of its production. Some bacteria may find their entry into milk from the cow itself during the milking operation. Others may be present in the milking

bucket itself, some may also get entry from the milker. Bacteria may also be present in the cow's udder and contaminate milk before it is drawn out of udder and some may get entry from the atmosphere. As it is very difficult to check entry of bacteria into milk all efforts should therefore be directed to reduce their number.

Some vital factors

Therefore, for clean and wholesome milk production we should have a healthy clean cow. Diseased cows should be kept separately. Before milking operation starts the hind (back) quarters of the cow need to be thoroughly washed with water to remove any dung or dirt sticking there. Wiping the udder with cloth soaked in a disinfectant solution such as potassium permanganet solution ($KMnO_4$) or hypochlorite solution will reduce the number of bacteria finding entry from that source. Long hair in the flanks and/or around the udder needs chipping regularly so that dung or dirt does not get any chance to stick there. The utensils and milking pails should be cleaned and sterilised (free from bacterial contamination) and milkers should be healthy persons free from any disease; their hands should thoroughly be cleaned before milking. Nails should be kept properly and regularly trimmed to avoid any teat injury from that source. Clean water, well ventilated barns are other requirements for clean milk production. The animals should be provided with enough of clean water for drinking purposes. The shed should be clean so that nuisance from flies are not there altogether or at least controlled. Flies carry germs and may contaminate milk. They find in dirty places and in dung and urine an excellent place for breeding and as such a clean barn is a must for clean milk production. Every time before milking, the floors of the barns should be cleaned and a little of water may be sprinkled so that dust may not rise. Milking should be completed as quickly as possible and the produced milk needs to be strained and collected into the sterilised milk can for shipment to the chilling plants or to the markets nearby quickly or otherwise the bacteria which have already found their entry into milk in spite of these precautions will multiply rapidly and start deterioration of the quality of milk. Therefore, all possible steps should be taken for early disposal of milk after its production.

Dangers from unpasteurised milk

Milk though described as "Life in the liquid form" may also be the cause of loss of life. Through milk a number of diseases like Tuberculosis, Typhoid, Malta fever, Diphtheria, Septic-sore throat may originate and as such taking of pasteurised milk should be a must. Adulteration of milk with water by the unscrupulous milk traders make milk unsafe and may be the cause of many diseases in human beings. Therefore one should always insist on having pasteurised milk.

Pasteurisation makes milk safe

Pasteurisation destroys all pathogens, i.e., disease producing bacteria without affecting the nutritive value of milk. Milk received in the chilling plants is immediately chilled to 40°-45° F. to control the rapid multiplication of bacteria. As soon as it is received in the Dairy Factory it is tested for purity and for fat and S.N.F. contents and also for any developed acidity and if found fit for processing is pasteurised (a process to eliminate all disease producing bacteria and more than 90 per cent of other non-pathogenic bacteria) and automatically filled in sterilised bottles and stored in the Cold Store at a temperature below 40° F before distribution to the consumers. If, however, refrigeration fails or there is any occasion of load-shedding the storage temperature starts rising and milk becomes liable to curdle due to rapid multiplication of bacteria which may survive pasteurisation. In summer months when the

atmospheric temperature is high bacteria gets multiplied quickly if milk is not kept cooled properly.

Consumers role

Consumers of milk, however, should always co-operate with milk scheme personnel in obtaining quality milk. They should on their part boil milk in clean utensils as soon as they receive their supplies from milk booths and just not left as such for considerable periods. After emptying milk, the bottles need to be washed in running tap water so that no milk solids or milky substances stick to the bottle. If the consumers take these precautions and help the milk schemes, the later can function more effectively to the satisfaction of general public.

Here are some hints on keeping your milk fresh. Three golden rules are—

KEEP IT CLEAN

KEEP IT COOL

KEEP IT COVERED

Always make sure that the pot/vessels into which you pour milk is quite clean. Don't allow milk to remain in the sun. Keep it cool. Always replace lid as soon as you take out your requirement from milk pot. By taking this care you will help to make the most of your share to Nature's most complete food.

Milk provides nearly all the nutritive factors essential to a good diet

4

PROJECT ADMINISTRATION WORLD FOOD PROGRAMME-618

Origin of Project Administration and its work

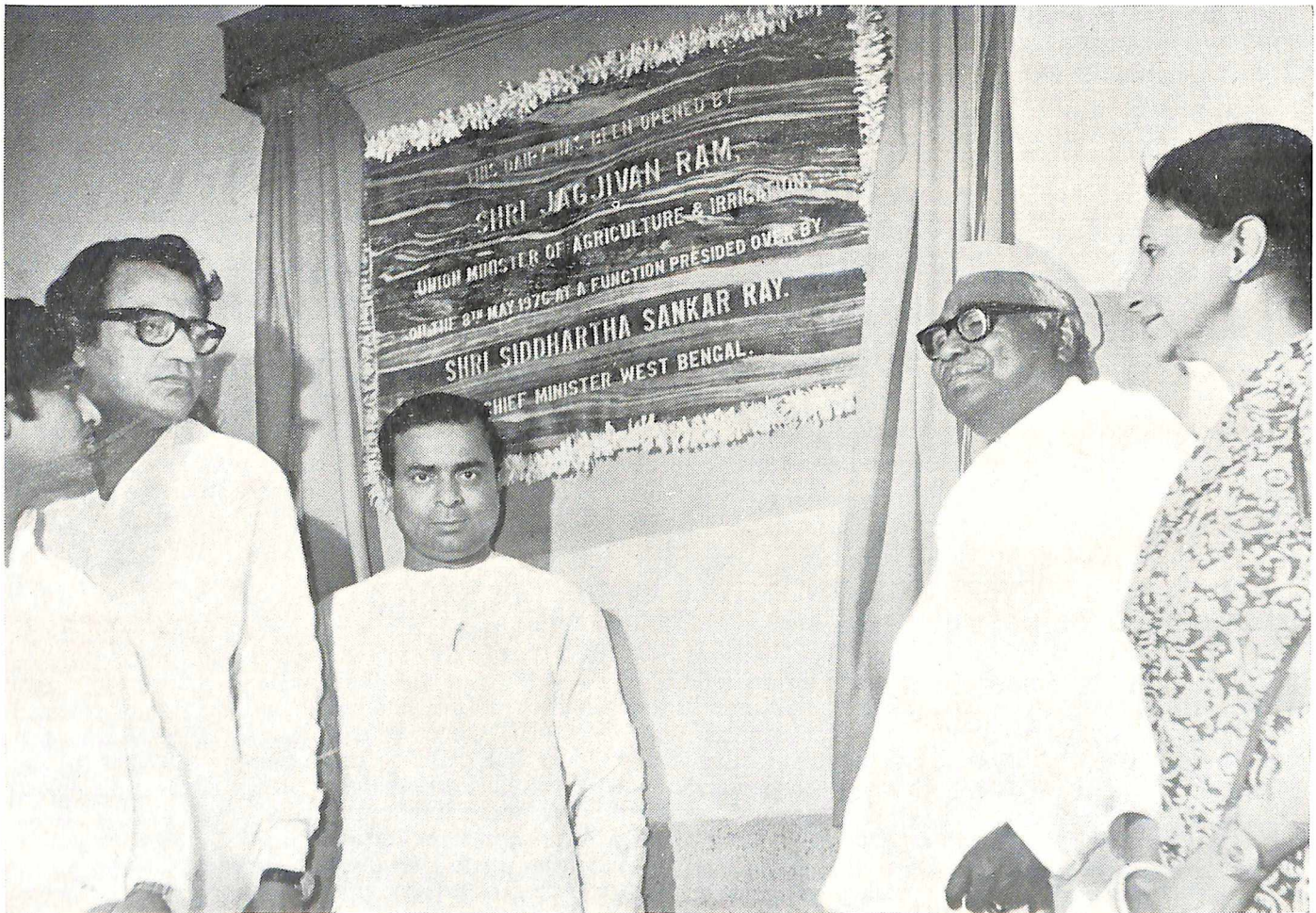
Out of the funds expected to be generated by sale of W.F.P. commodities, a sum of Rs. 18.92 crores was proposed for West Bengal for implementing a package scheme for enhancement of milk production and through that bringing in a socio-economical change in the life of cow-keepers in villages. This scheme is frequently mentioned as "Operation Flood" not only because of its concept for milk production enhancement programme by organising co-operative Milk Unions but happens to be one of the largest milk enhancement programmes taken up in the world. It envisages complete participation and

involvement of milk producers from production/ collection of milk in villages by organising village level societies and integrating approx. 500 such societies to a Union. Unions thus created are expected to have complete command over 1,25,000 breedable animals and a Dairy for processing 1,00,000 ltrs. of milk per day and thereby having a bargaining position for marketing their milk and milk products. All the inputs for enhancement of milk production, recurring costs, interest on loan and repayment thereof, is to be supported from a marginal retention of 5 to 6 paise per litre from the consumers' price paid for collected milk. The organised channel thus created from village level Primary Society's collection

point to the Dairy Factory is being utilized for flowing back inputs for enhanced milk production. The macro level inputs like feed mill, stud farm, frozen semen bank, veterinary aid etc. is handled by Union while macro level inputs like Artificial Insemination, supply of feeds & fodder, etc. are handled by village level society. The Scheme in essence envisages to pay off the price of milk daily to its producers in village, provide for veterinary aid at Farmers' door-step, artificial insemination services and meet the feed and fodder requirements of animals through farmers' organisation. It thus

becomes an organisation "Of the Farmers, By the Farmers, For the Farmers" & none else.

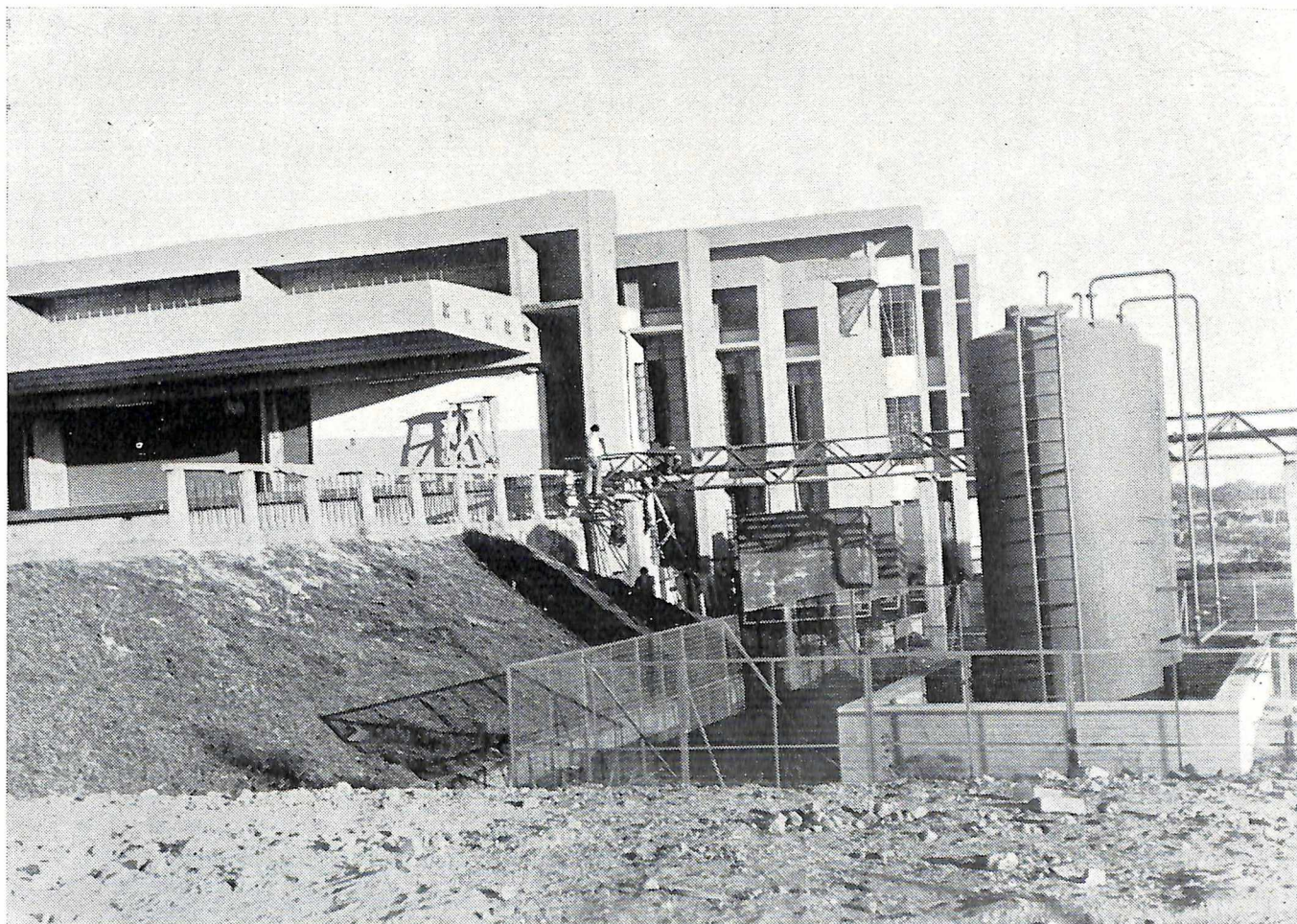
A Project Administrator & Co-ordinator and ex officio Joint to the Government of West Bengal, Animal Husbandry and Veterinary Services, Department was therefore, appointed in order to administer & bring together the multifarious services that are required to be rendered in evolving such organisations and building up required infrastructure so that Milk Unions after having been evolved can be handed over to the producers organisation for them to run.



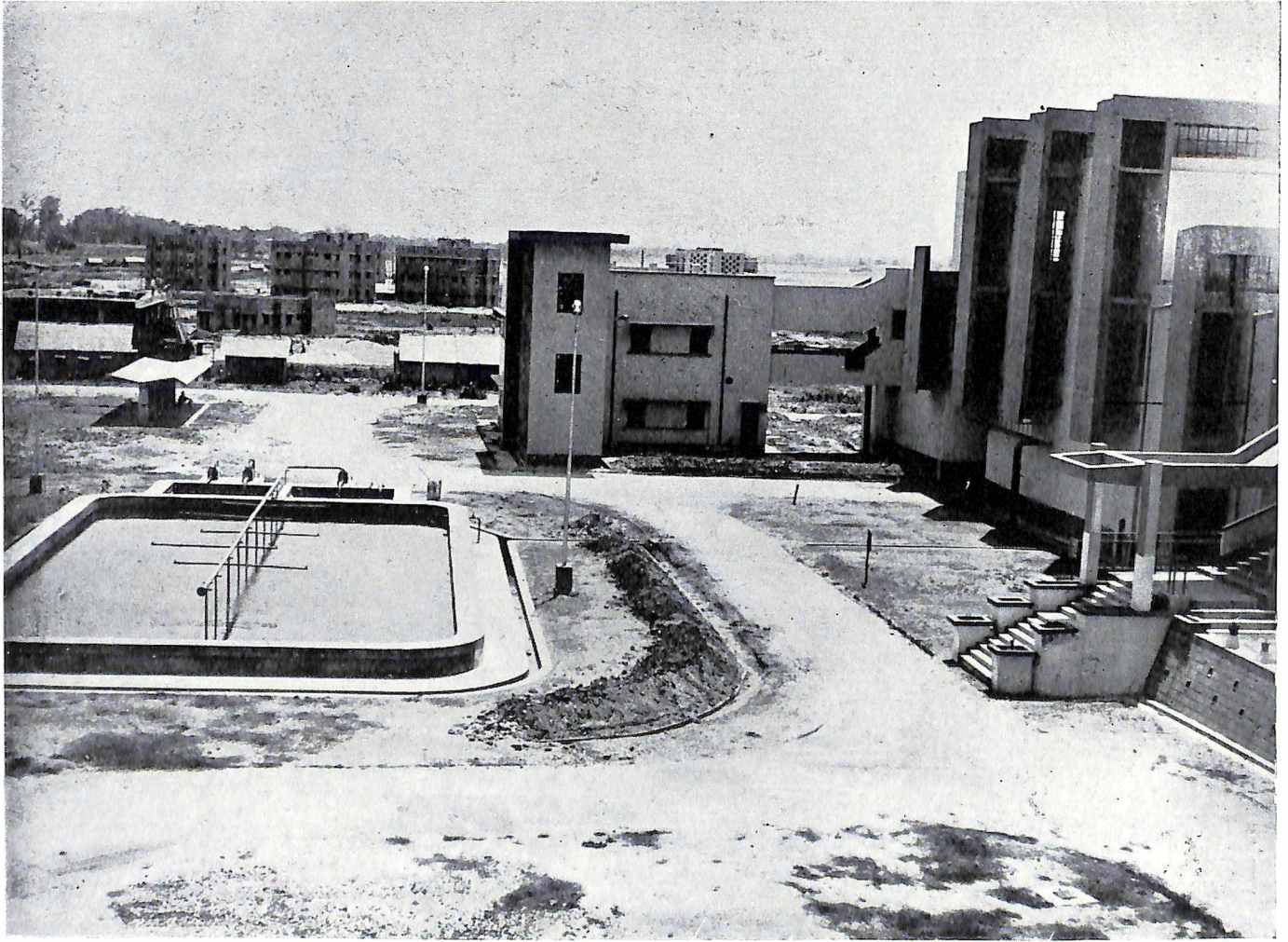
Matigara Dairy Opening Ceremony

Officials from various disciplines working under Animal Husbandry, Dairy, Veterinary, Engineering and Co-operation Directorates have been drafted under the Project Administration so as to cater to the needs of creating the Milk Unions. The multiplicity of disciplines that need to be combined together so as to render the services needed for the package deal indicates the complex nature of the work involved. The work of the

Project Administration in short is to foster the growth of the Milk Union by way of organising producers to join together, build up the requisite infrastructure for handling milk i.e. Chilling plants, Dairy Factories, Cattle feed plant, Stud Farm, Frozen Semen bank, Fodder bank, etc., etc., and finally hand over to producers' Co-operative to run the show of their own.



Matigara Dairy Production Block



Panoramic view of Multipurpose Dairy—Matigara

The Plan of operation has been phased over a period of 5 years.

Area of operation

The Operation Flood districts in West Bengal comprises of Murshidabad, Nadia, Darjeeling, Jalpaiguri, West Dinajpur, Malda, Burdwan, Bankura, Midnapur and 24-Parganas, Limited by availability of funds, only two of the milk shed areas were taken up in the first phase viz ;

- (1) In the District of Murshidabad and part of Nadia District organised under Bhagirathi Co-op. Milk Producers' Union Ltd.
- (2) In the district of Darjeeling including Islampur Subdivision of West Dinajpur and Jalpaiguri District organised under Himalayan Co-op. Milk Producers' Union Ltd.

Progress has been so satisfactory that work on third milk shed area in Midnapur district will also be taken up shortly.

Feeder balancing dairies supported by Milk Chilling Centres

A. One Multipurpose Dairy at Matigara in Darjeeling district at a cost of 239 lakhs has already been installed with a capacity to handle 100,000 ltrs. per day. The dairy has been equipped for manufacture of dried milk, butter and ghee in addition to market milk. This dairy was completed in 3 years scheduled time.

This dairy is supported by a net work of six milk collection-cum-chilling centres in the hill region, viz. (1) Tung, (2) Mirik, (3) Rambhi, (4) Sukhiapukhri, (5) Kalimpong and (6) Bijanbari. Machinery for all of these chilling plants has been procured and those at Tung and Sukhiapukhri are already in operation. Successive ones are due to spring up in action with

the organising of further societies around those which again is in progress under NDDB Spearhead Team working in Hills. Himalayan Milk Producers Co-operative Union Ltd. (HIMUL) will now formally take over the dairy for operating so that the Union may be in a commanding and bargaining position with its products like skim milk powder, butter, ghee, etc. and can bring an impact in milk and milk product marketing and thereby flowing back inputs for enhanced milk production to primary society members.

It may be interesting to note that even in its infancy, HIMUL is not only feeding the twin townships of Siliguri and Jalpaiguri with market milk, but also sending out pasteurised milk for citizens of Calcutta relaying through Bhagirathi Cooperative Milk Producers Union Ltd. and supplementing the Dairy Directorates' Supply in Calcutta by approx. 3% per day. Thus milk from high hills of Darjeeling at a distance of over 600 KM has now started to reach the milk consumers in Calcutta.

The Dairy has formally been inaugurated by Sri Jagjivan Ram Union Minister for Agriculture on 8th May, 76.

B. In order to make the already organised Bhagirathi Cooperative Milk Producers Union Ltd. on identical bargaining position with its product, another 100,000 ltrs. capacity feeder balancing dairy near Berhampore town is in process for which required actions have been initiated. This dairy is expected to be ready in three years time. The estimated cost of the dairy is in the region of 235 lakhs.

C. Expansion of City Milk Dairy

Expansion of Central Dairy at Belgachia was taken up for augmentation of its throughput from 150,000 ltrs. per day to 300,000 ltrs. per day by the Project Cell. For that, additional milk storage capacity for 250,000 ltrs. has already been installed. Recombining and pasteurising capacity of existing plant has been augmented. Two giant bottling lines, each capable of bottling 24,000 bottles per hour,

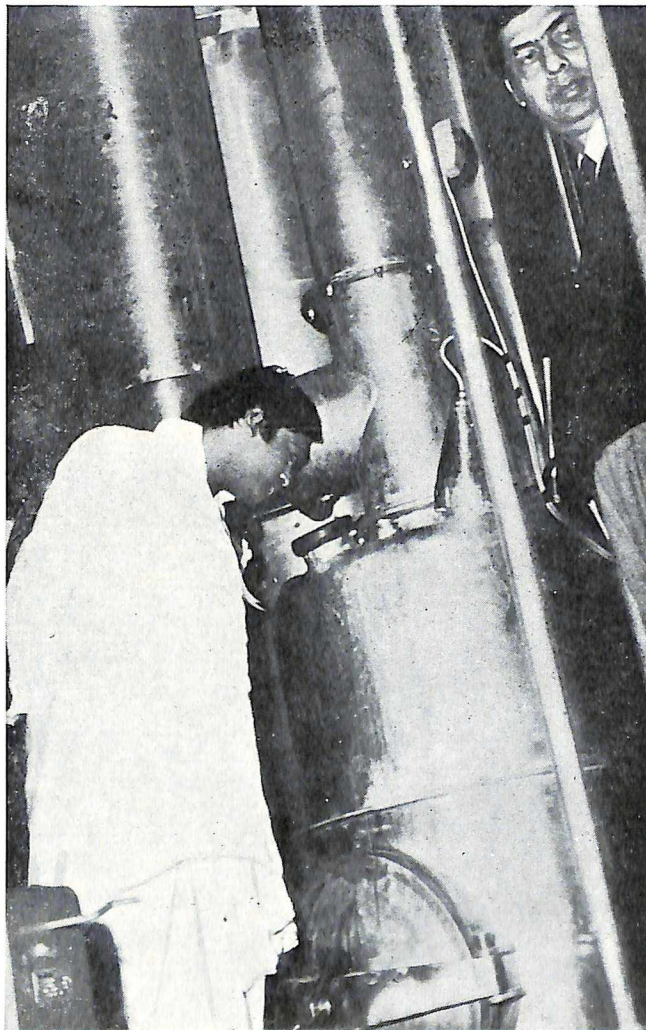
additional cold storage space and service facilities, e.g. steam refrigeration, water supply and sewage disposal have been provided for Central Dairy, Belgachia. A new annexe has been constructed for housing the additional facilities. The work involved an expenditure of Rs. 90.00 lakhs and has since been completed as per schedule.

D. New City Dairy (Mother Dairy at Dankuni)

The estimated demand of milk for Calcutta being in the order to 7.5 lakh ltrs. per day, the difference between the supply that can be made from Central Dairy, Belgachia having an augmented capacity of approximately 300,000 ltrs. per day needs to be met. As such work for construction of a new Mother Dairy having a capacity to handle 400,000 ltrs of milk per day at Dankuni under Chanditala P. S. in Hooghly dist. has been taken up and the same is on way of completion. Milk from this dairy will be made available to public in hitherto unadopted packaging and dispensing system, viz. in pilfer/adulteration proof (a) polythene packages (b) coin operated bulk vending machines. Guarding the interest of consumers for quality and rendering service happens to be the prime motto here.

STUD FARM AND ARTIFICIAL INSEMINATION

A. At Siliguri a Stud Farm has been established and now has ten Jersey bulls. It is proposed to hand over this Stud Farm to the Himalayan Co-operative Milk Producers' Union Ltd. very shortly. This Stud Farm produces on an average 4,500 doses of extended semen per month for supply to twenty two Primary Co-operative Societies of the Milk Union and to thirty eight centres and sub-centres of the Animal Husbandry and Veterinary Services Department. It has also been possible to extend the supply of semen to Islampur sub-division, West Dinajpur.



Powder Plant—Matigara Dairy

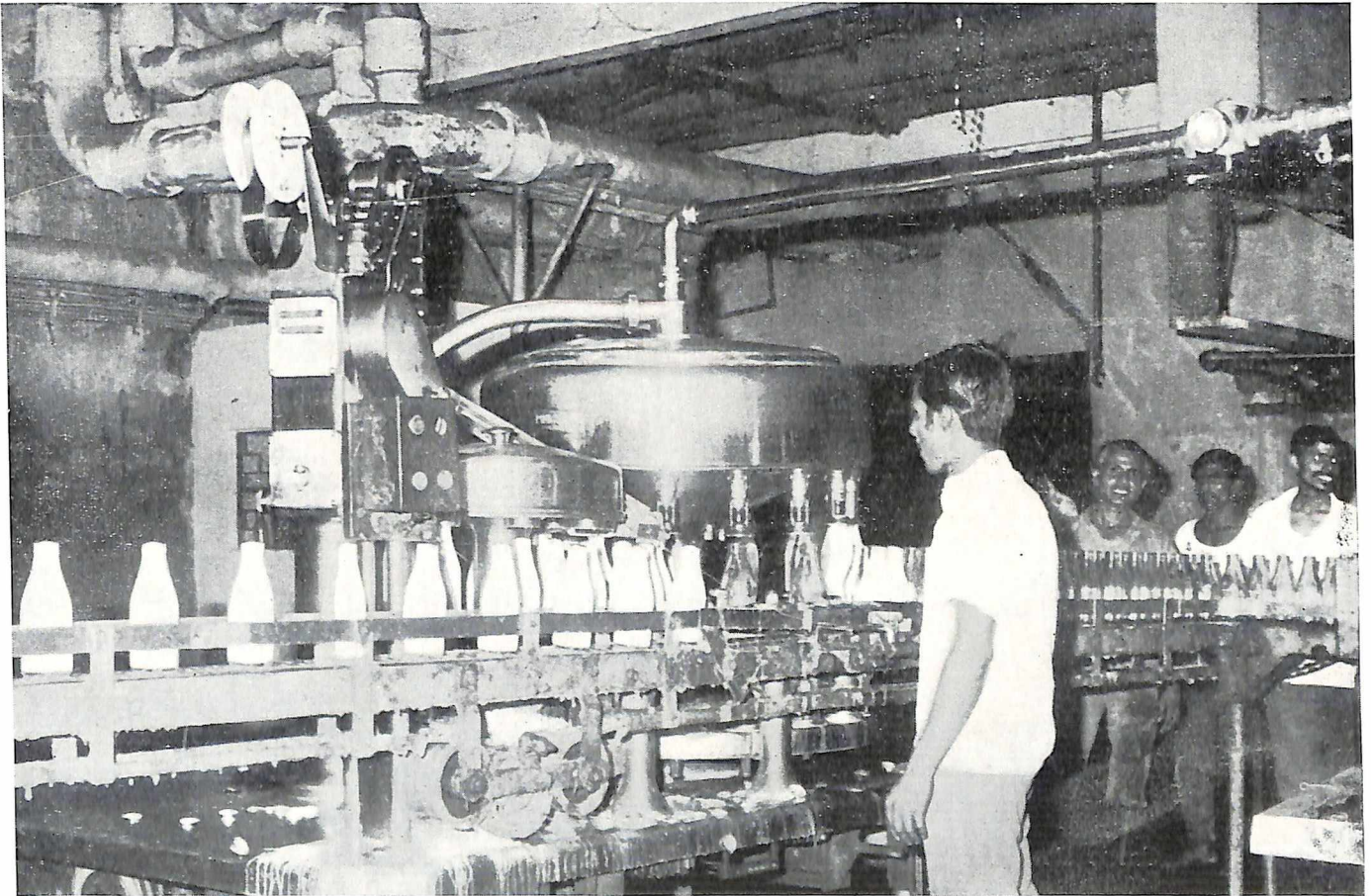


Photo of the new Bottling Plant—Central Dairy

With the help of the Danish International Development Agency, it is anticipated that a Frozen Semen Bank can be established at Siliguri so as to streamline the semen distribution system and avoid dependence on liquid semen of unpredictable quality. Forward action in this regard has already been initiated.

Additional land is being acquired for cultivation of green fodder so that the bulls have all the year round supply of green fodder.

The entire Stud Farm along with the Frozen semen bank will be handed over to the Himalayan Co-operative Milk Producers' Union Ltd.

B. The Bhagirathi Co-operative Milk Producers' Union Ltd., Beldanga have established a Stud Farm at Beldanga on a temporary basis. The permanent Stud Farm for this Union is being established at Nimtola, about 5 km. distance from Berhampore town on the road to Jalangi. The temporary Stud Farm has been started in a hired shed along with a semen processing laboratory. At present, this centre is producing on an average of 3,000 doses of extended semen per month. This semen is being utilized through 34 primary Co-operative Societies under the Bhagirathi Co-operative Milk Producers' Union Ltd. Semen is also being supplied to the Directorate of Animal Husbandry and to the Directorate of Veterinary Services.

Cattle Feed Plant

A Cattle Feed Plant with a capacity of 100 M/T. per day is presently under construction at Siliguri on a turn-key basis at a cost of Rs. 72.00 lakhs. It is expected that this plant will be commissioned by October, 1976 to make concentrate feed and Calf Starters available to exotic bred high yielding animals.

Plans are under way for the establishment of another Cattle Feed Plant under the Bhagirathi Co-operative Milk Producers' Milk Union Ltd. The

site has been selected and the proposal for acquisition of the land is under progress.

At present Cattle Feed is being purchased by the Milk Unions and is being distributed to the Primary Producers members through the Societies on no profit no loss basis.

ANIMAL HEALTH COVERAGE

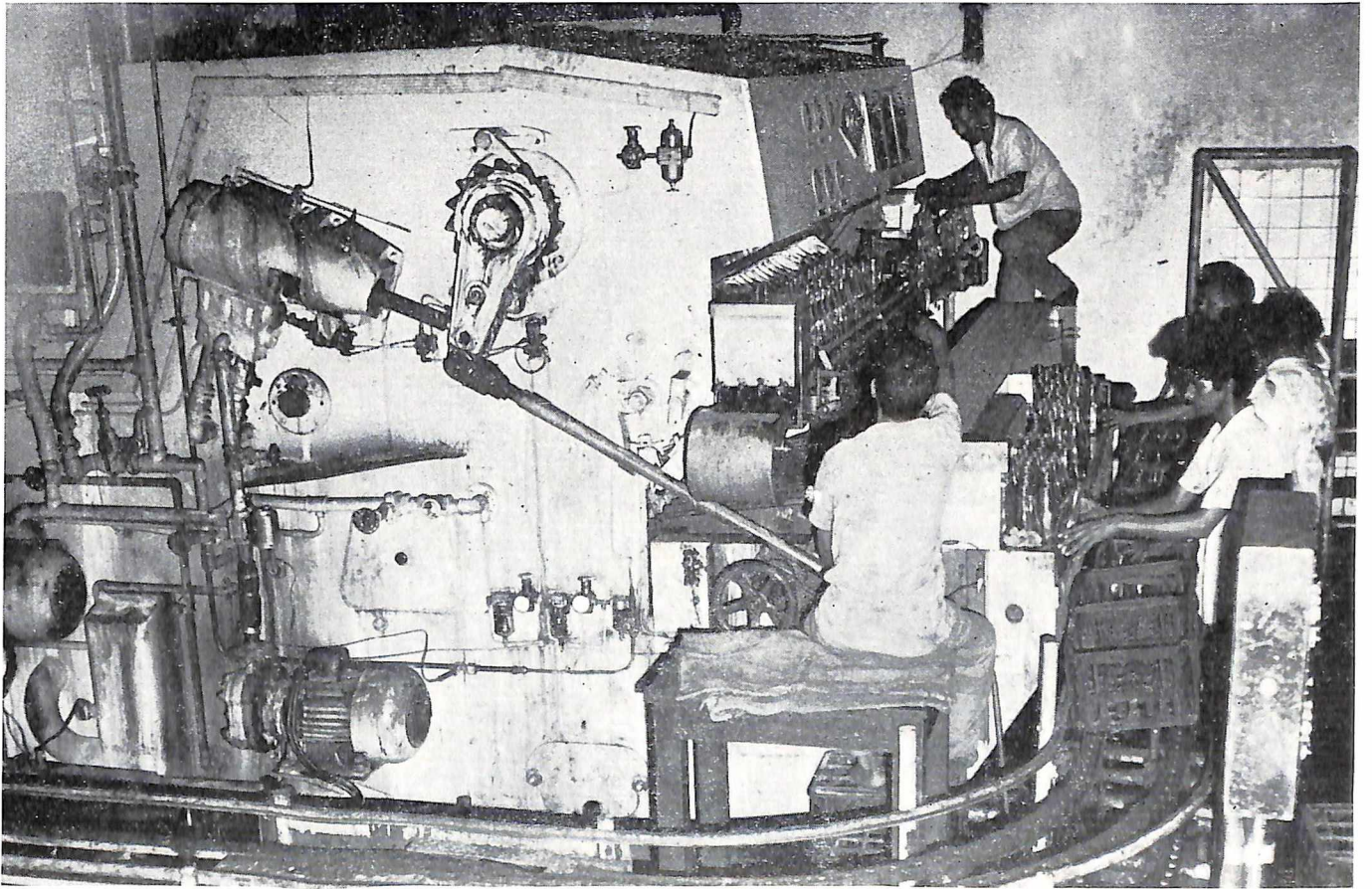
Both the Milk Producers' Milk Unions at Murshidabad and Darjeeling have introduced two mobile veterinary routes each. It is striking to observe that the producer members are very much satisfied and happy with this type of veterinary aid and services at their door steps which they have relished for the first time in their life.

DAIRY EXTENSION SERVICES

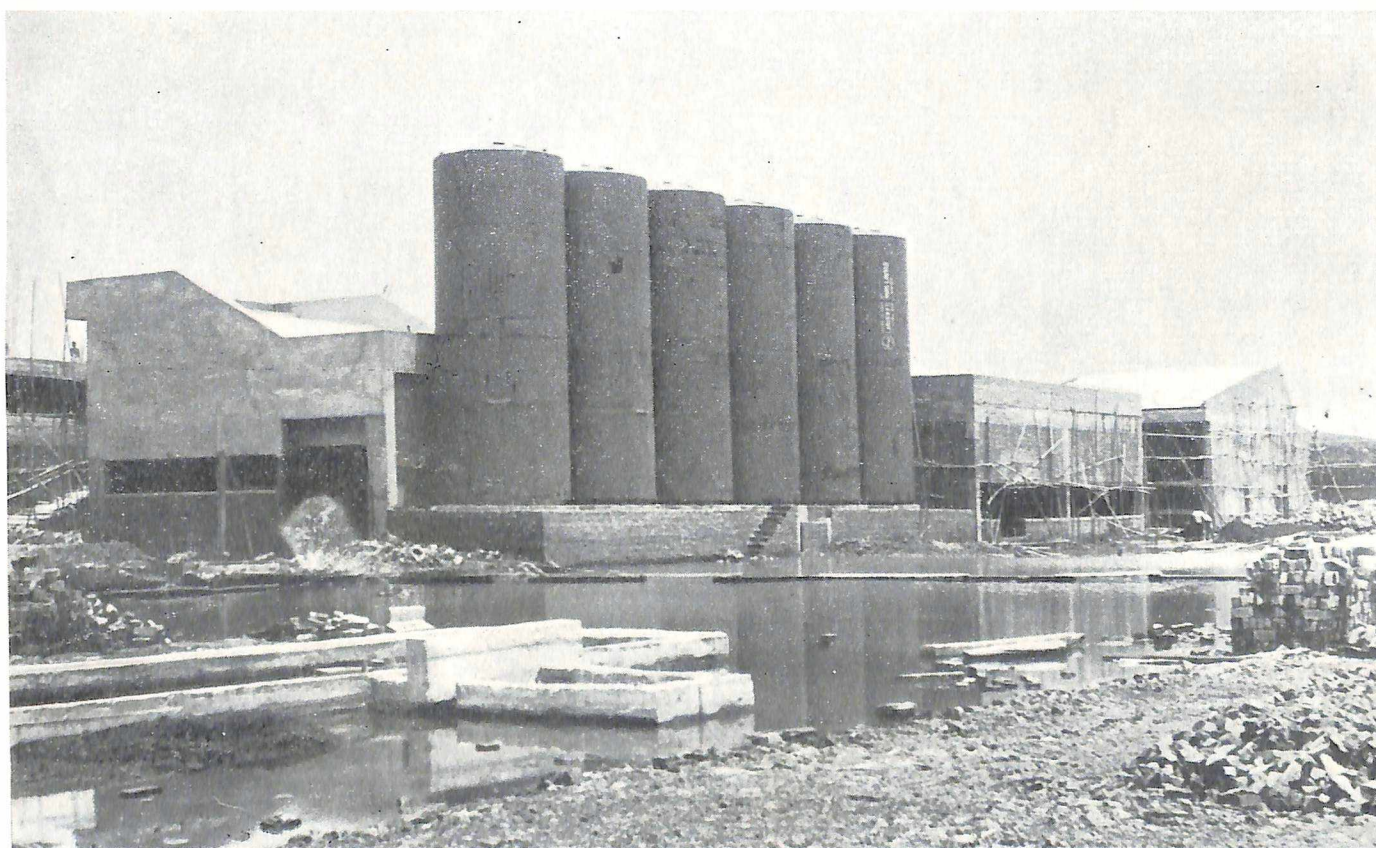
Trained Dairy Extension Workers of both the Milk Unions are maintaining constant contacts with the primary societies and members, advising them on day-to-day problems, improved techniques. A sense of involvement & unification is thus having its awareness over the wide areas of both the districts of Darjeeling & Murshidabad. Both the Milk Unions are publishing monthly bulletins in regional language, highlighting the activities of the Milk Union, providing technical and scientific information in simple readable language.

MILK MARKETING

A. The Himalayan Milk Union is selling part of their milk to meet the local fluid milk requirements at Siliguri, Jalpaiguri and Darjeeling. The remaining quantity is being converted into skimmed milk powder and butter/ghee. The primary producers are paid at the rate of Rs. 1.14 per kg. 57 Primary Co-operative Societies are presently supplying 6,500 kg. milk per day. Farmers are paid after every 10 days.



New Milk Bottle Washing Plant—Central Dairy



Dankuni Dairy—Progress of work of the Poduction Block



Milk storage tank inside the Mother Dairy at Dankuni

B. The Bhagirathi Milk Union is selling their milk to the Greater Calcutta Milk Supply Scheme, after chilling the same at the Milk chilling Centre at Bel-danga, which has been handed over by the Milk Commissioner, West Bengal to this Milk Union presently on managerial basis. 78 Primary Societies are presently supplying 11,200 kg. of milk per day, and are being paid Rs.1 .98 per kg. The farmers are paid daily for the milk supplied.

QUALITY TESTS

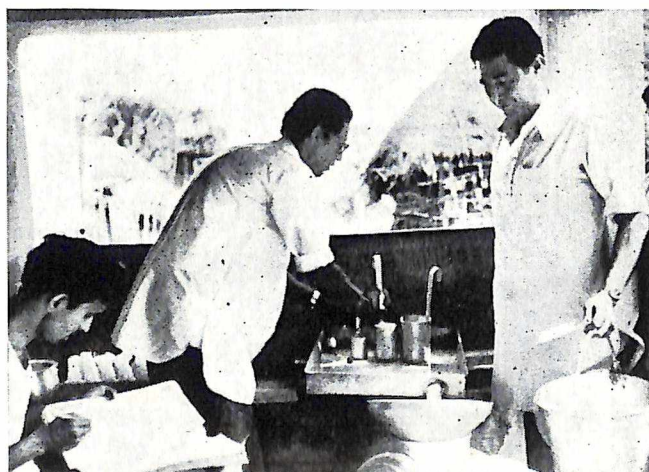
Another important feature which has emerged within the short span of operation of Bhagirathi Co-operative Milk Producers Union is that the quality of milk reaching the Chilling Plant has improved to such an extent that it appears to be a forgotten thing of past. This has been possible by collecting milk twice daily and testing the producers milk at his presence at the village level and above all by inspiring a sense of belonging amongst the member producers.

FUNDS

To assist the technical input programme up to April 1976 over and above the capital expenditures incurred on construction of dairies, chilling plants, stud farms, semen banks, feed mills etc. the Govt. have also chanelised funds towards the Milk Unions are follows :

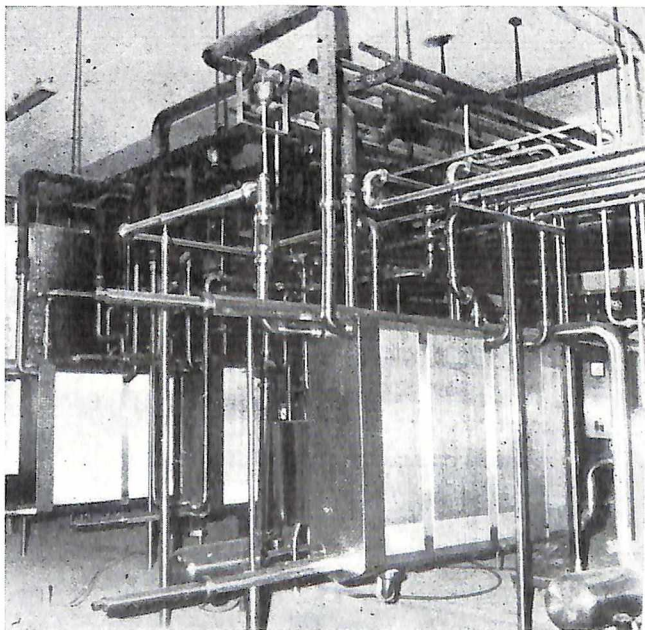
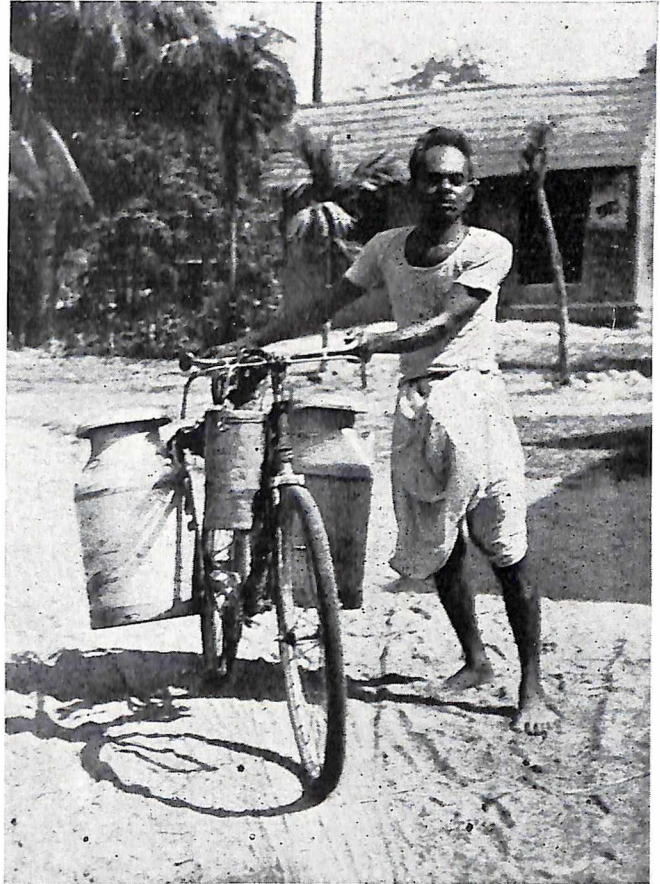
DIVIDEND

It is heartening to note that the Primary Societies of Bhagirathi Co-operative Milk Producers' Union have already been able to distribute Patronage Dividend to its producers members.



Producers' milk is measured and tested at the Society; Results are also recorded in card kept with producers

Headload man carrying milk up to the pucca road point on bicycle where he delivers the milk to the truck, villages having A. I. sub-centre. He also collects Jersey Bull Semen and carry it back in Semen Shipper to the Society.



Inside Dankuni Dairy—The Production Block

Development of improved milch animals

Since a large number of bulls would be required for cross breeding work, a "Bull Mother Farm" has already been established under this Project Cell in West Bengal by importing 30 numbers of high pedigree incalf Jersey heifers and three bulls to form the foundation stock for production of high quality Jersey bulls. The farm has already been able to sell five Jersey bulls to Bhagirathi Co-operative Milk Producers' Union Ltd. at a cost of Rs. 4,000 each. The strength of the herd as on 31st March 1976 was as follows :—

Bulls	...	6
Cows in milk	...	21
Cows (dry)	...	1
Pregnant Cows	...	18



Young stock

Heifers	...	7
Bulls	...	3

Below one year

Male calves	...	13
Female calves	...	11
Total stock	...	62

It is appreciating to note that a number of these Jersey cows are now registering more than 3,000 litre of milk per lactation.

To avoid high gene frequency from one, two or three sires in the progenies, these cows are being mated only with, frozen semen from plus "Proven Sires" flown from foreign countries.

As more heifers come into production, it is expected that the Bull Mother Farm will be able to meet its expenses by sale of milk and sale of bulls and other stock.

Through the activities of the Project Administration, WFP-618 the horizon is gradually widening up for the poor milk producing villager.

No more the producer is to be exploited by the middleman in trade. Further he will have an involvement in the Milk Union collecting, processing and marketing milk. His own organisation shall provide him the macrolevel & microlevel inputs for enhancement of milk production at his door step. He now looks forward for a new horizon to open up.

First Generation Jersey Cross calf with its indigenous mother



Free Veterinary aid is available to the producers through the Mobile Veterinary Units



Cultivation of green fodder is an important tool for increasing milk production. The picture shows lush green Berseem Field.



Producers come and stand in a queue to deliver milk at the Society

Hon'ble Minister Shri Pradip Bhattacharjya distributing Bonus (Patronage Dividend) to a member-producer





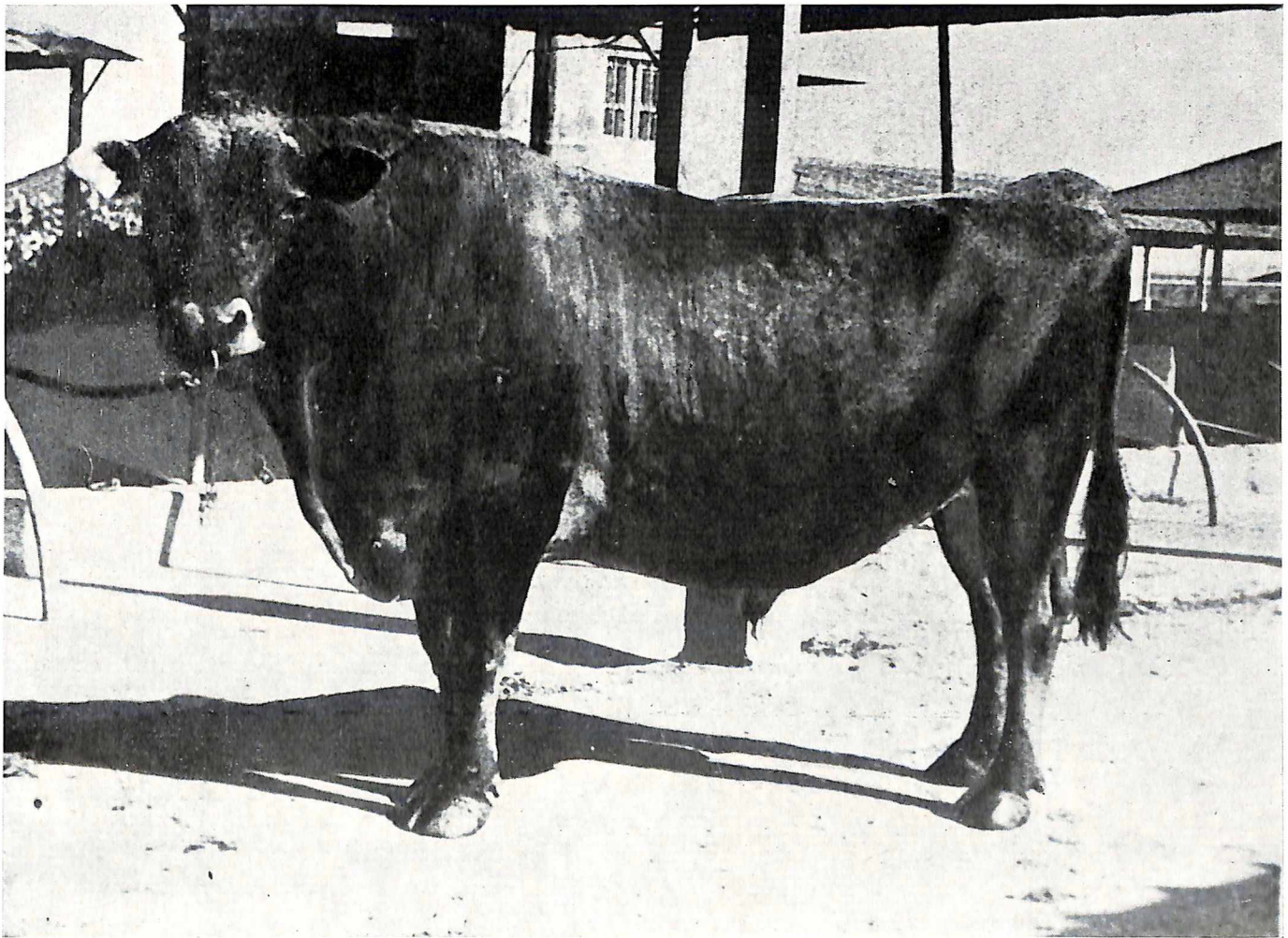
Milk reception at Chilling Plant



Milk testing at Society level



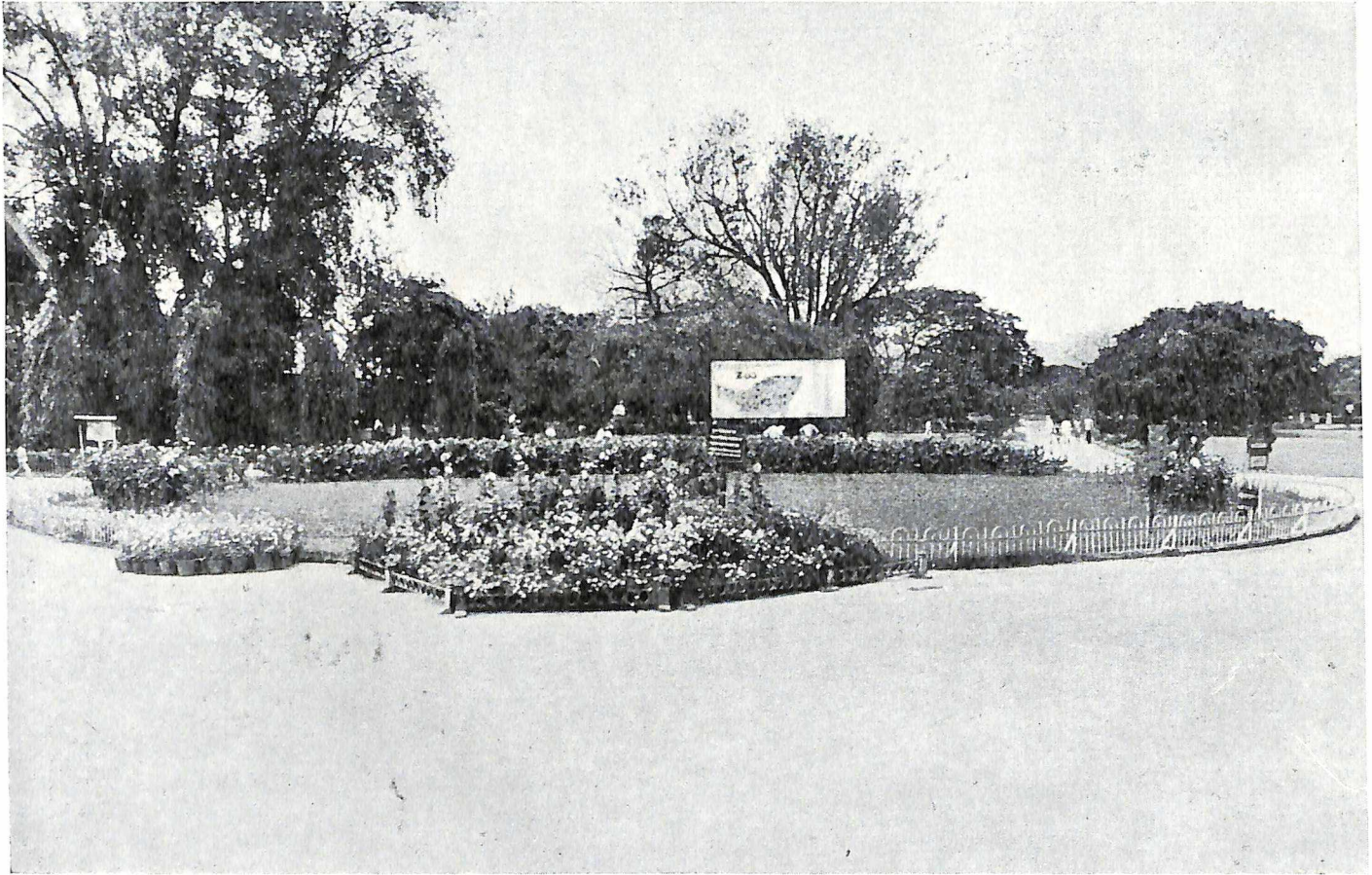
Headload transport of milk from Society to truck-point



Jersey Bull of Bull Mother Farm located at Haringhata



Feed Mixing Plant at Siliguri—Construction in progress



Panoramic view of Alipore Zoological Garden

5

ZOOLOGICAL GARDEN,

The four-year period from 1972-73 to 1975-76 has been an era of activities and achievements for this Garden culminating in Centenary Celebration of the Garden on the 30th September 1975, which was inaugurated by Shri Jagjivan Ram, Union Minister of Agriculture and Irrigation, presided over by Shri A. L. Dias, Governor of West Bengal and attended by Shri Siddhartha Sankar Ray, Chief Minister, West Bengal, Shri Pradip Bhattacharyaya, Minister of State, in charge of Animal Husbandry and Veterinary Services Department, Shri Sitaram Mahato, Minister-in-charge of Forest Department, Shri Ram Krishna Sarogi, Minister of State, Public Works Department and Shri Sankar Prosad Mitra, Chief Justice of Calcutta High Court and several other dignitaries.

Some developmental works, viz., construction of a modern Reptile House; Seal Pool; a modern Aquarium building with tortoise pool and an over-head water reservoir for constant supply of filtered water which were already in hand got new fillip during this period and some of these projects are nearing completion. It is gratifying to note that the new Reptile House was dedicated to the lovers of wild life as Centenary Building on the 30th September 1975, by Shri Pradip Bhattacharyaya, Minister of State, in charge of Department of Animal Husbandry and Veterinary Services, West Bengal.

A consorted breeding programme taken in hand started paying rich dividends by establishing a good herd of Themin Deer (*Cervus eldi*) in the

Garden which is in threat of extinction in its own home land Manipur. Successful breeding was instrumental in establishing a good race of White Tigers during this period and also a number of African Lion cubs were reared up which enriched the Greater Cat family. The most outstanding achievement of this Garden in the field of scientific breeding of mammals was rewarded by the birth of two Tignons by cross breeding a Bengal Tiger (Munna) and an African Lioness (Munni) which were named as Rudrani and Rangini by Shri Siddhartha Sankar Ray, Chief Minister, West Bengal—the only living Tignon in the world now. Breeding programmes of birds were also carried out methodically and scientifically. This effort of ours also was crowned with success by raising good flocks of exotic birds like Chinese Silver Pheasant, Malayan Crested Fire-back Pheasant, Black Swan, Palwan Peacock Pheasant and some indigenous birds like Nicobar Pigeon, Sarus Crane,

As a part of Centenary Celebration a programme for importing exotic animals worth Rs.2,00,000 foreign exchange was taken in hand. Out of this a good number of exotic animals have already been received and others are awaiting shipment. Some exotic birds, namely, Blue-eared Pheasant, Mikado Pheasant, Green Jungle-fowls have been brought through an exchange programme. Collection of all these exhibits has made this Garden richer and have received good appreciation both from the press and the public.

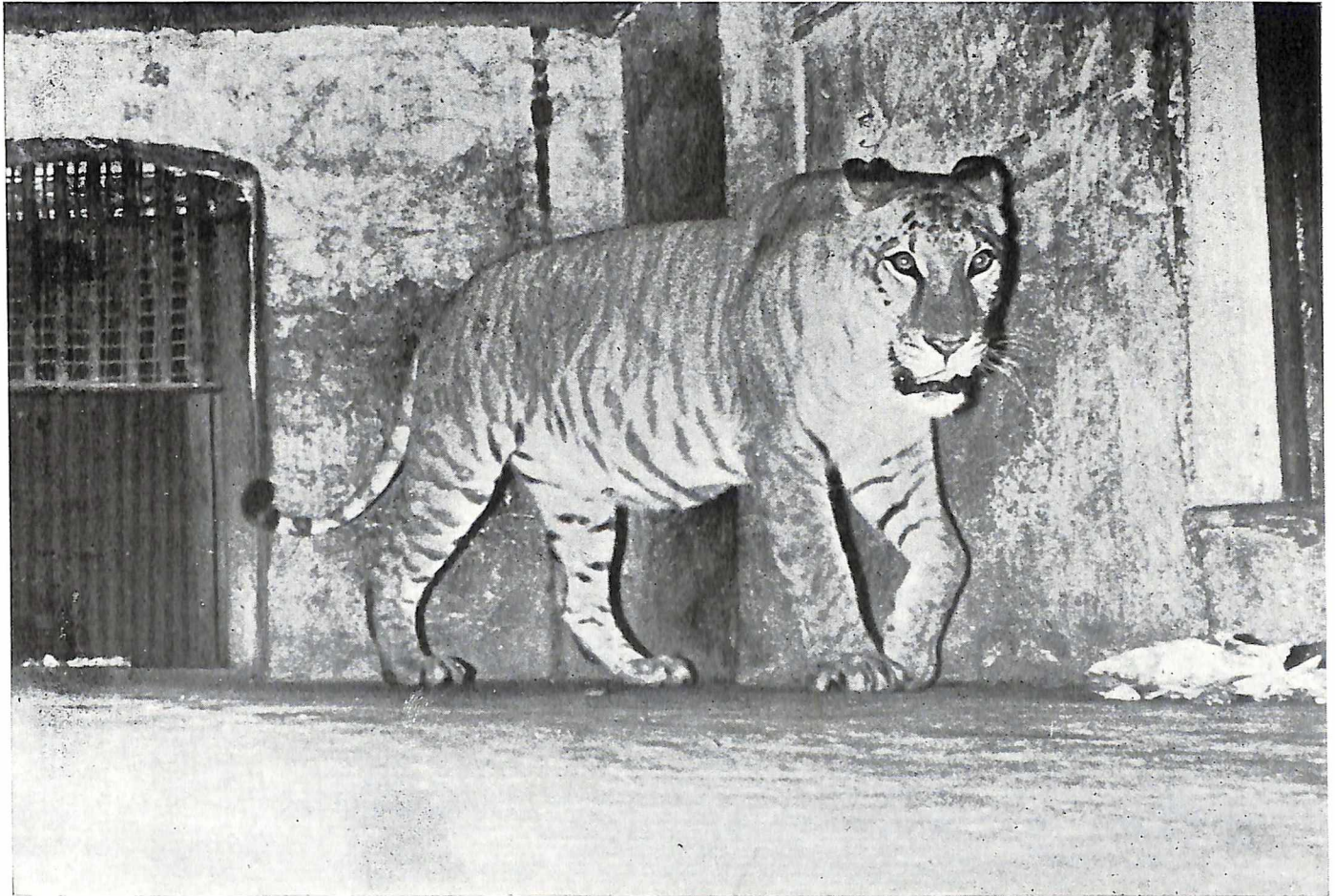
To increase the greenery and add to the scenic beauty of the Garden a number of shady and tall trees have been planted along the boundary wall. Spoon-bill, etc. The notable achievement in this

branch is that this is the first time in the annals of the history of this Zoo that a pair of Painted Stork was hatched and reared up.

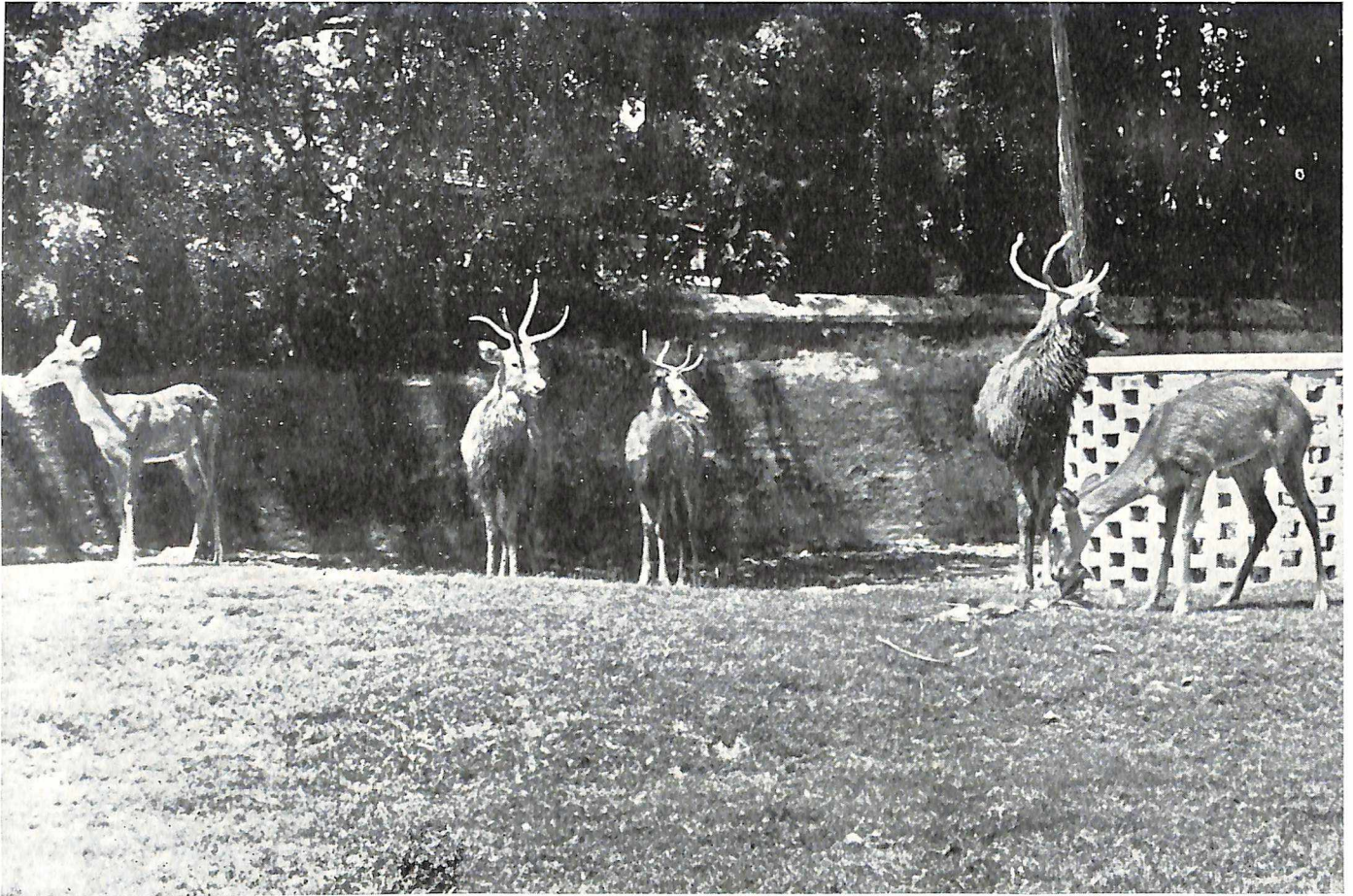
Amenities to the visitors were provided by constructing and modernising entrance gates, putting up walls along the bank of big lake to provide comfortable abode for the seasonal migratory birds out of developmental plan grants and also increasing the number of public conveniences to meet the need of visitors during the rush period.

For the amenities of the employees of this Garden and strengthening social contact amongst them a "Zoo Employees Recreation Club" has been established in the Garden where also a "Creche-cum-Nutritional" programme is being run for the benefit of the children of the Zoo employees in collaboration with Tere des Home, a Swiss philanthropic organisation.

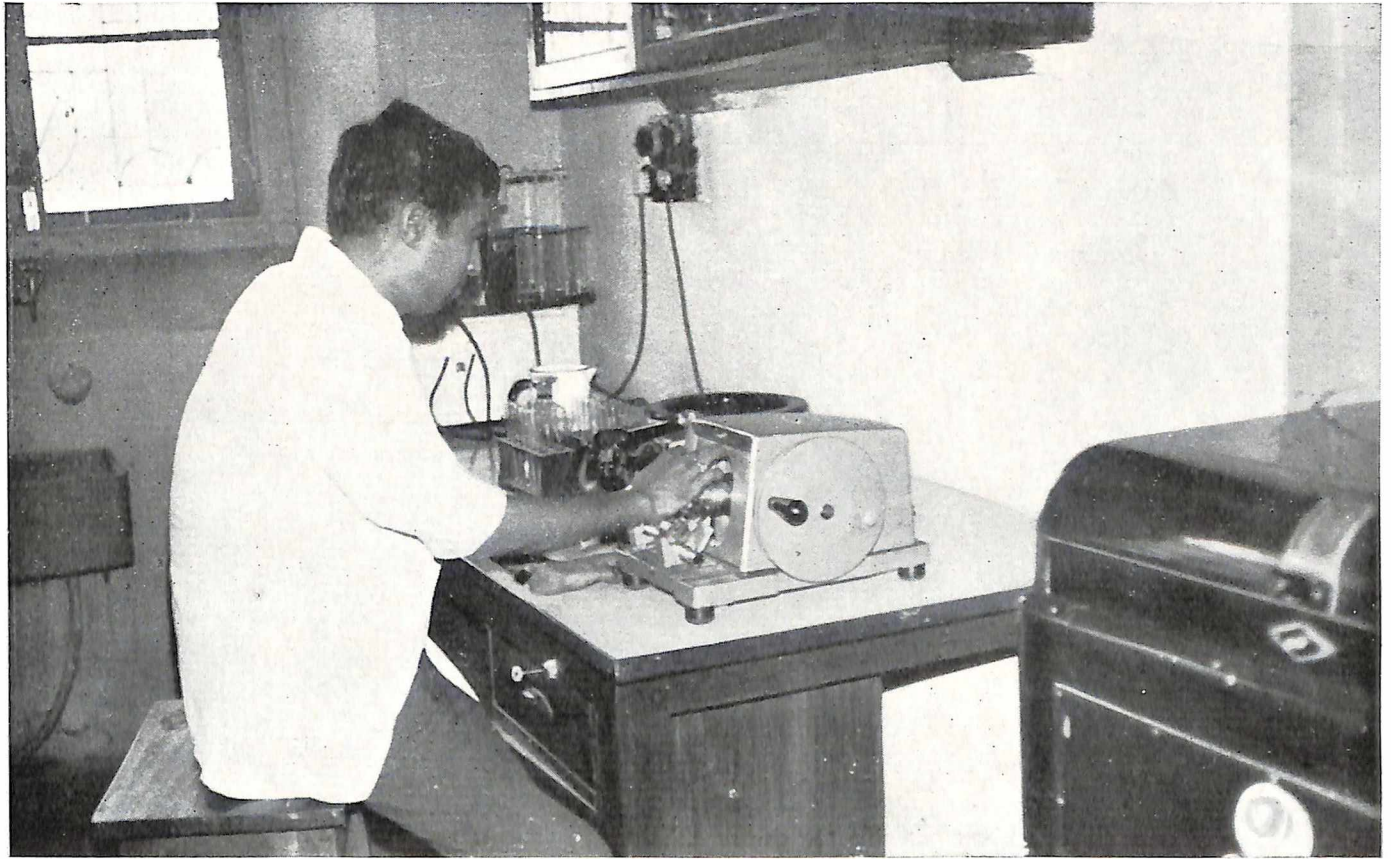
With a view to generate interest amongst the people, particularly the children in wild life, their conservation, to disseminate knowledge and as a part of educational programme a number of radio talks in various programmes like "সংবাদ সমীক্ষা, সংবাদ বিচিত্রা, শিশুসমহল এবং বিদ্যার্থীদের জন্য" were arranged. Such educational and informative programmes were also arranged through Calcutta T.V. Centre. Writers, journalists, intellectuals were also fully involved in wild life and initiated to write on Zoo life with a view to popularise this Garden. By arranging such mass media programmes it is comforting to note that public awareness about wild life, their conservation and popularity of this Zoo Garden have increased immensely.



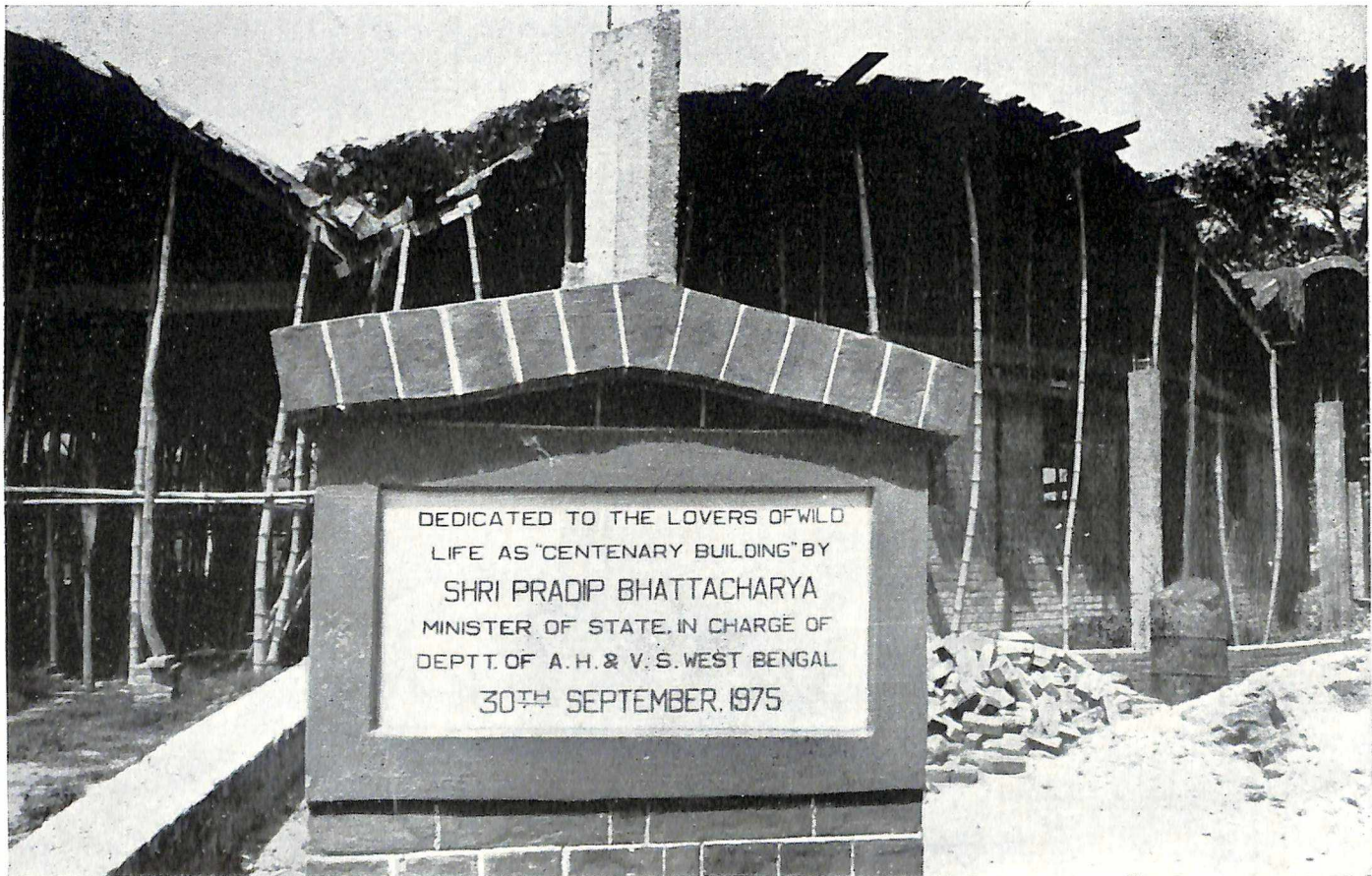
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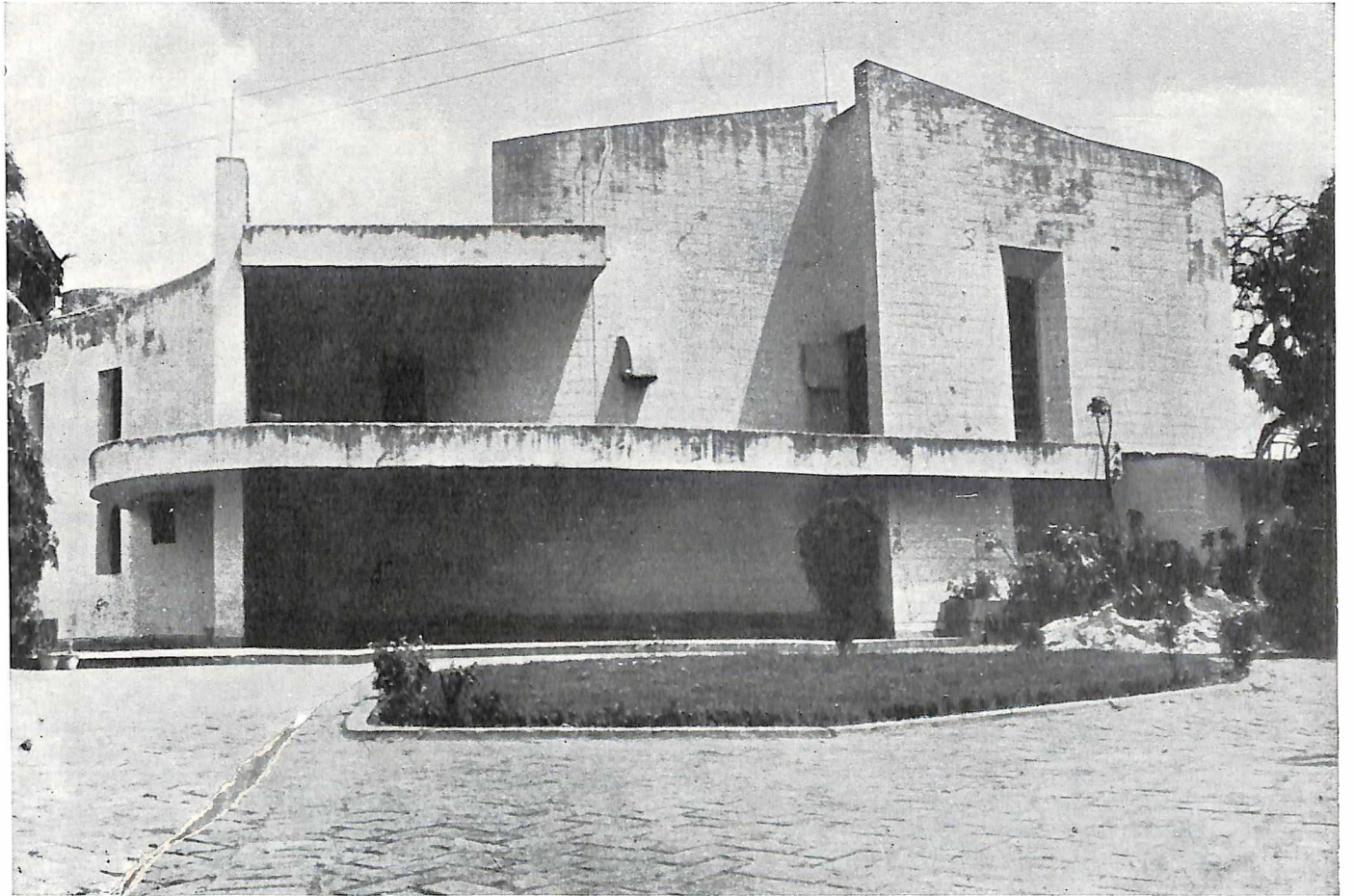
A breeding programme taken up by the zoo started paying rich dividends by establishing a good herd of Thamin Deer (*Cervus eldi*), rare animals, which is facing the threat of extinction in its own homeland Manipore



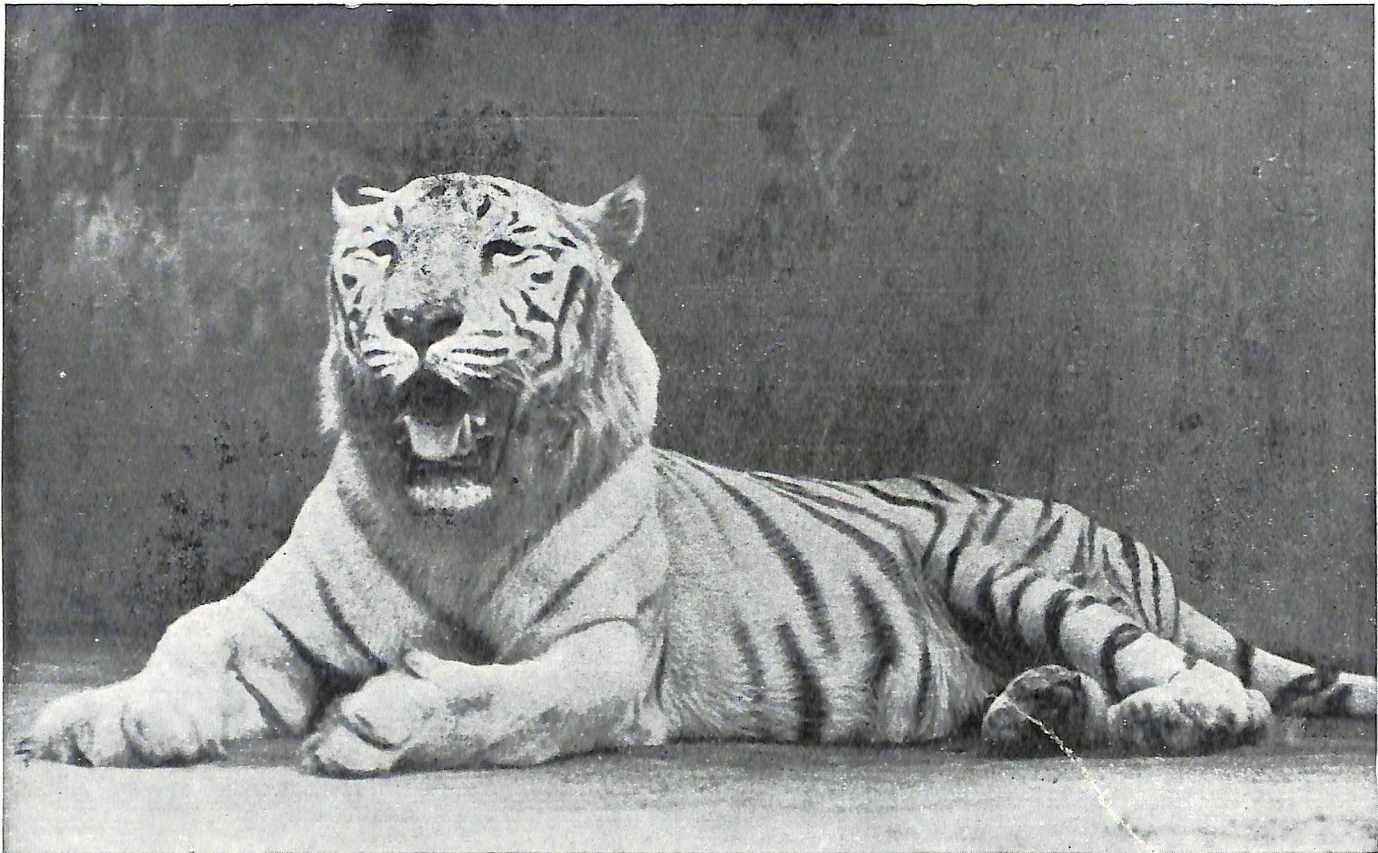
Audio-Visual Centre of Alipore Zoo where pictures on wild life are shown and scientific seminars are held



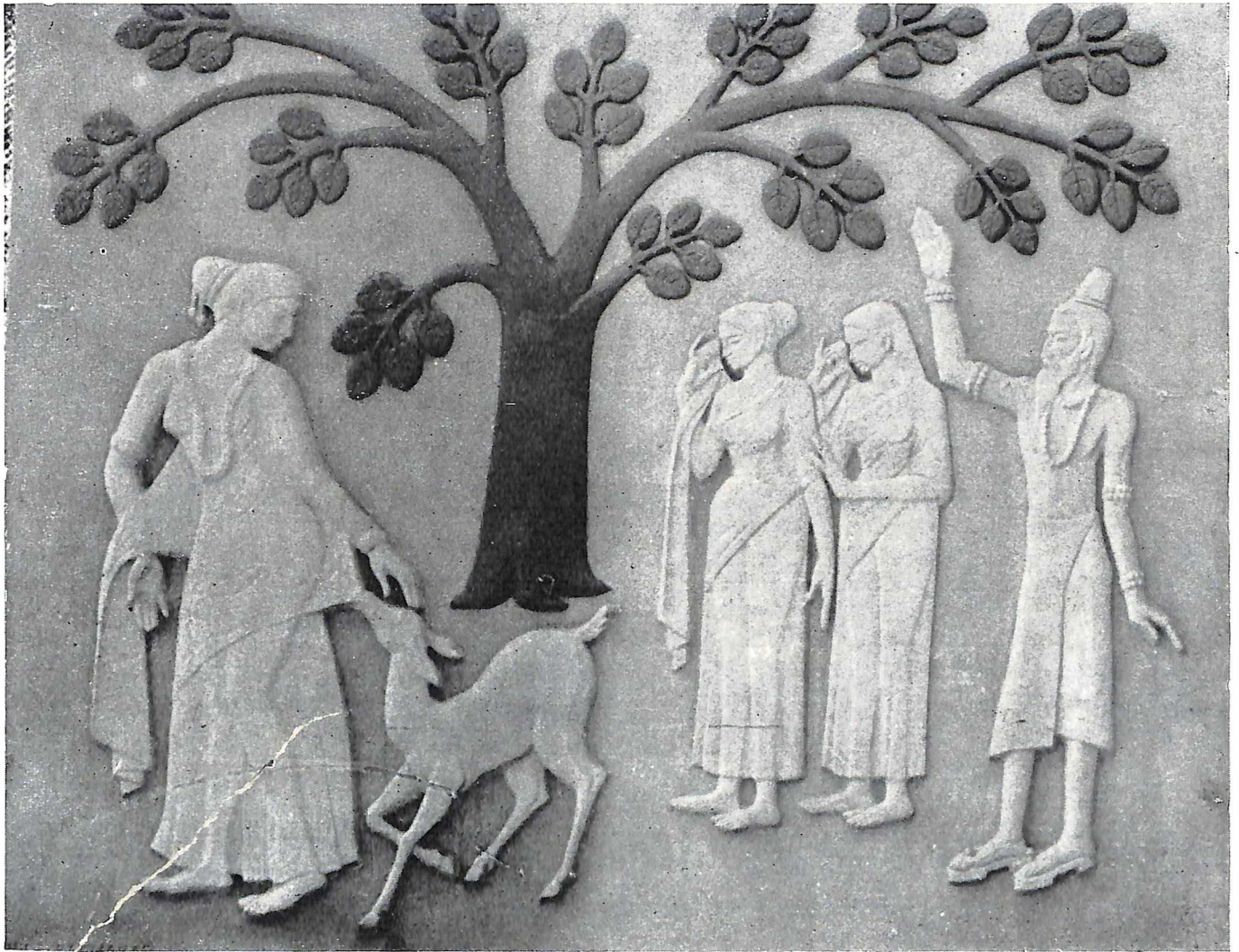
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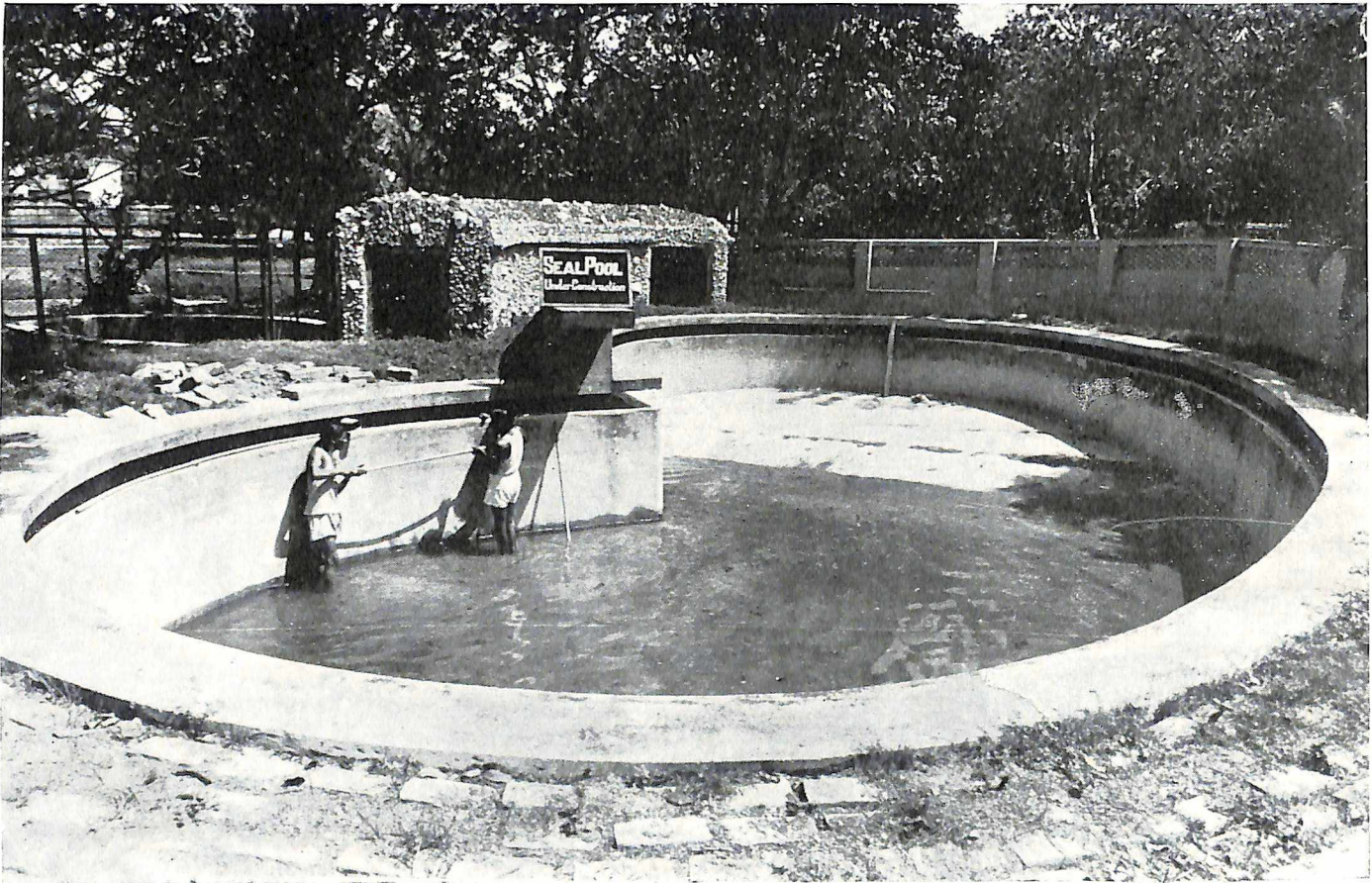
A modern Aquarium Building of Alipore Zoo nearing completion



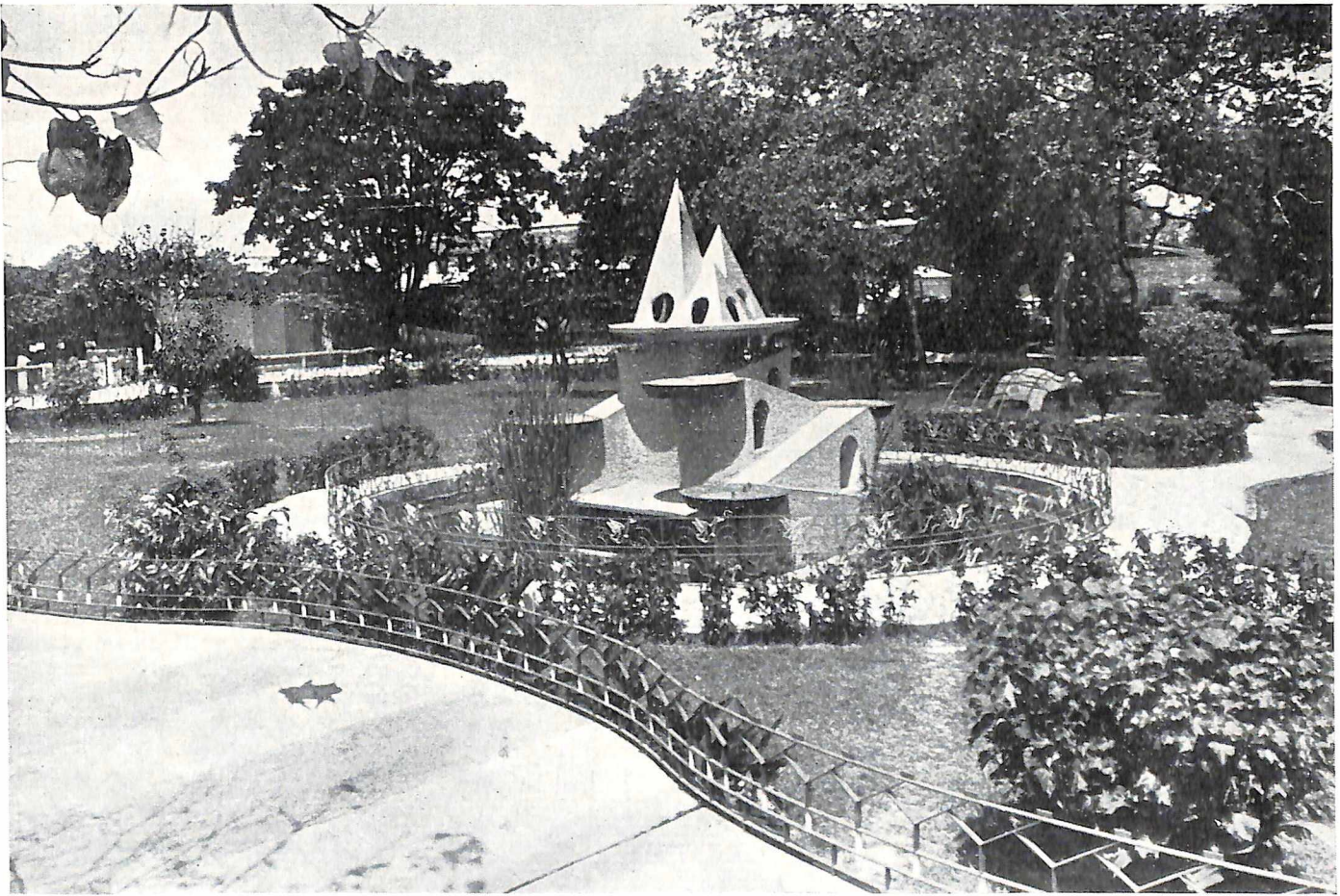
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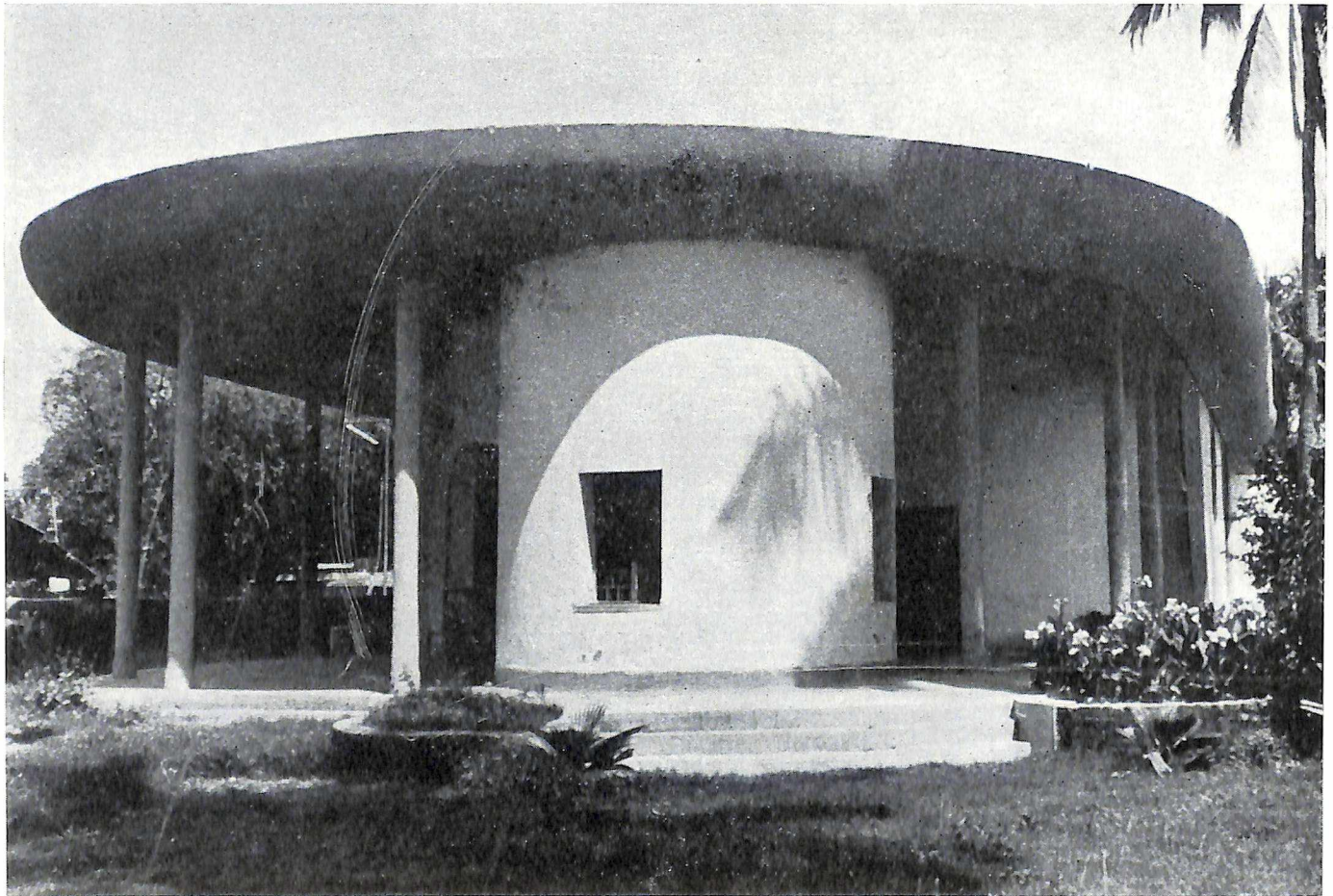
A Wall Relief in Children's Zoo of Alipore Zoological Garden showing Shakuntala leaving hermitage of Rishi Kanwa for her husband's palace.



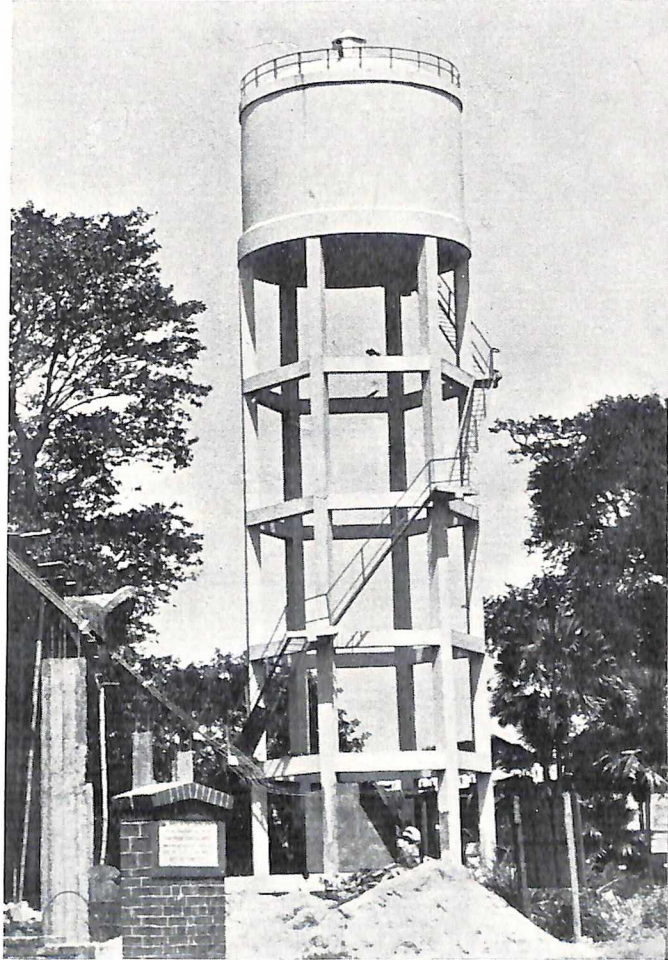
Sealion Pool of Alipore Zoo under construction



To increase the greenery and add to the scenic beauty of the Garden a number of shady and tall trees have been planted along the boundary wall. The African Babla tree is a pride of the garden.



New Reptile House of Alipore Zoo under construction



Newly constructed water reservoir of Alipore Zoo

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