

Tamil Arasu

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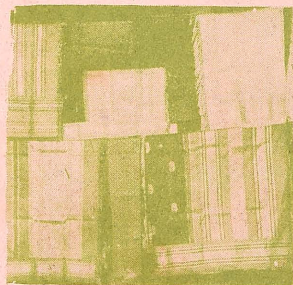
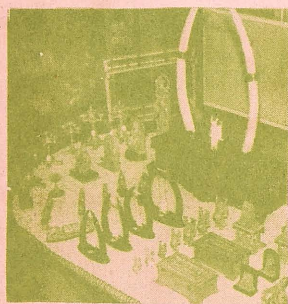
KURALAGAM

Madras-1.

KHADI-KRAFT

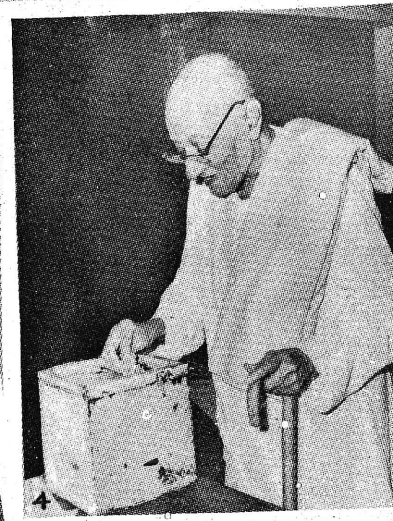
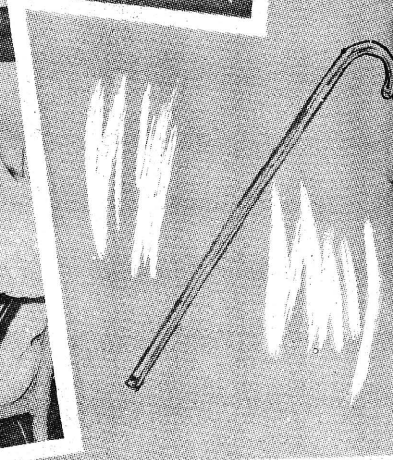
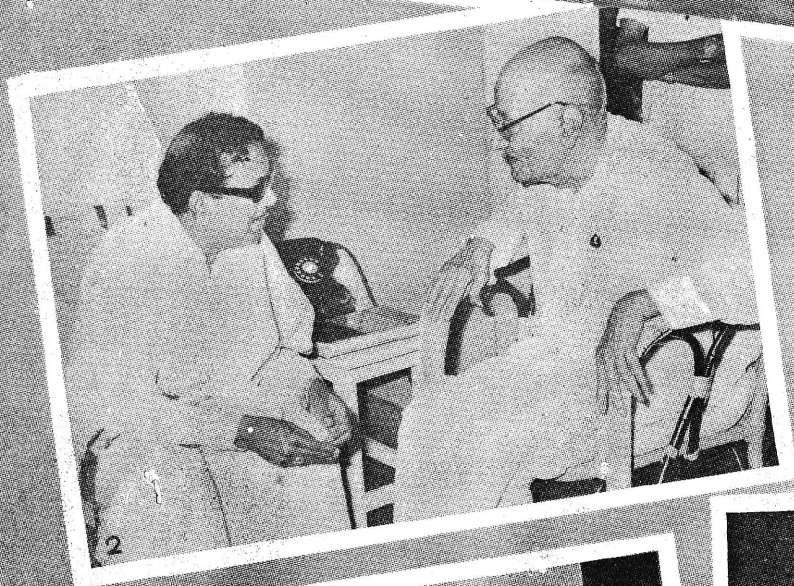
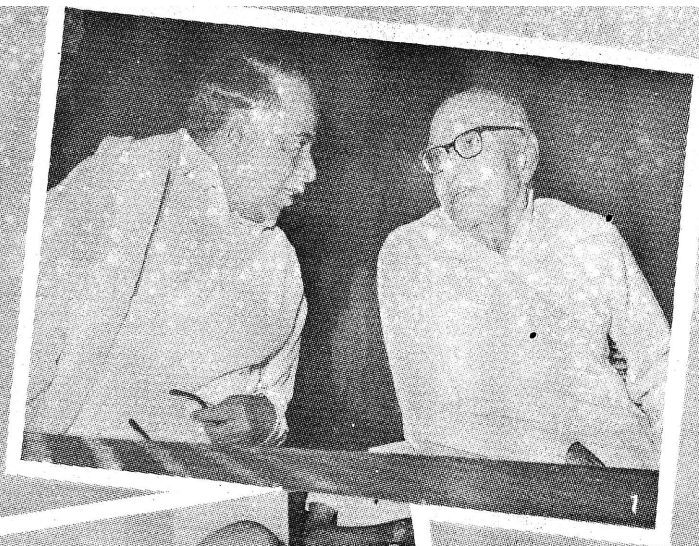
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REPOSITORY OF
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ARTICLES



MUTHU





Tamil Arasu

Wishes

PROSPERITY

to

all

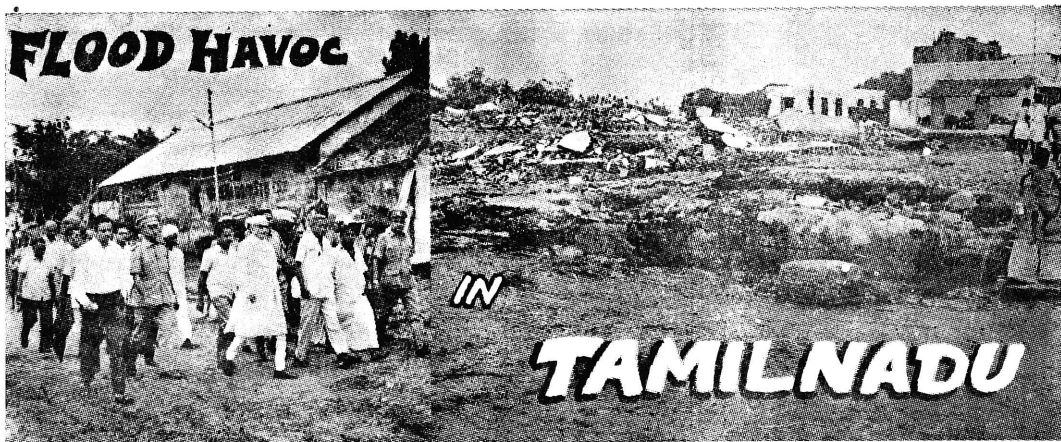
Chander....



Vol. III 1st January 1973 Issue 9

CONTENTS.

	PAGES
Flood havoc in Tamil Nadu	4-7
Know your Heart	9
Chamundi of Charapallam	10-11
Socialism at any price—C.M.	12-14
Special features on Madras Government Museum.	19-40
Goals of Education, Science and Technology in Tamil Nadu.	41-43
Perspective Plan for Family Planning in Tamil Nadu.	51-53
Rehabilitation of repatriates	54-56



A severe cyclonic storm struck our coast close to Cuddalore around 5 a.m. on the 6th December with savage fury, bringing in its wake torrential rains accompanied by tempestuous winds reaching a velocity of 150 kilometres per hour. The entire coastal region from Madras in the North to Vedaranyam (Thanjavur District) in the South received very heavy rains on the 5th, 6th and 7th December ranging from 227 mm. in Adirampatnam in Thanjavur to 341 m.m. in Cuddalore and thinning out to 282 m.m. in Madras during the 3 days, 5th, 6th and 7th December 1972.

Forewarned of the impending cyclone, the authorities had taken necessary precautionary steps in the coastal districts, particularly in South Arcot, Chingleput, Thanjavur and Madras City. People living in low-lying areas had been evacuated to safer places ahead of the cyclone. A large number of trees and electrical and telegraph posts had fallen due to the cyclone, particularly in South Arcot District. The heavy local rains had resulted in the breach of a number of tanks, resulting in disruption of road and rail communications along the coast on the 6th December.

But the worst was yet to come. The cyclone weakened after crossing the coast, degenerated into a deep depression, started moving slowly across the peninsula and emerged into the Arabian Sea, still as a depression, only on the morning of the 8th December. For a full forty-eight hours, therefore, there lay across the peninsula a deep depression, with its central core slowly moving westwards along a trail touching the Kalrayan hills, Jawadi hills, Sheveroy hills and the Nilgiris bringing torrential rains to hundreds of square miles of land, unaccustomed to such downpour. Thus the western portion of the State which is the watershell of most of our rivers received copious rains during 7th, 8th and 9th ranging from over 350 m.m. in Nilgiris district areas to 400 m.m. and above in proverbially dry areas like Harur and Dharmapuri. Not able to cope with such flash floods the river and lake system over flood their banks, formed new courses breached bunds, cut roads, scoured bridges and inundated lakhs of acres of land till they emptied

themselves either into the Bay of Bengal or into bigger rivers capable of dealing with the discharge. In the Process, they wrought devastation over a vast area in terms of loss of lives, both human and animal and loss of property, both public and private.

The Districts most affected were South Arcot, North Arcot, Salem, Chingleput, Coimbatore, Dharmapuri and the Nilgiris.

South Arcot district.

The eye of the cyclone crossed the coast near Cuddalore on the morning of 6th December with a wind velocity reaching 150 km. per hour. Due to the cyclone, there was very heavy rainfall in the entire district, totalling 340 cms. on the three days namely the 5th, 6th and 7th December. A number of trees and also electric and telegraph posts were uprooted and communications were disrupted badly. On the 7th and 8th the cyclone further weakened into a deep depression, moved westwards and brought heavy rains to the western districts of North Arcot, Salem, Coimbatore and the Nilgiris, particularly in the areas comprising Kalrayan, Jawadi and Sheveroy hills. The rainfall of about 12 to 15 inches in the Jawadi hills resulted in an unprecedented inflow into Sathanur reservoir in North Arcot District, just west of South Arcot District. This reservoir had been closed for irrigation on 30th November 1972 with a level of 118 feet as against the full level of 119 feet. Thus, even before these heavy rains, the reservoir was almost full and was not in a position to receive any further inflow. The inflow due to the rains had therefore to be released into the Pennaiyar river and the discharge had to be progressively increased from 19,423 cusecs on the 6th to 43,095 cusecs on the 7th and 96,466 cusecs on the 8th. There was a sudden rise in the inflow at about 3 a.m. on 9th December 1972 and the water level in the reservoir was rising dangerously very much beyond the full reservoir level, endangering the reservoir itself. The Executive Engineer, Tivuvannamalai, who was camping at the Dam site, opened all its shutters in and the discharge increased to 2,56,747 cusecs as full

GOVERNOR USHERS SPEEDY AID

against the designed maximum discharge of 2,00,000 cusecs. The jungle streams below the reservoir which fall into Pennaiyar were also carrying heavy floods and these increased the total inflow into Pennaiyar to 2,75,000 cusecs, which was unprecedented. **The water discharged from Sathanur Reservoir during a period of 24 hours on the 8th and 9th was equal to $3\frac{1}{2}$ times the total capacity of the reservoir itself.** The Tirukoilur anicut constructed across Pennaiyar 110 years ago was washed away completely. The other rivers in the district, namely, Manimuthar, Gomuki, Vellar, Paravanar, Malattar and Gadilam were also in spate during this period. Pennaiyar river, unable to contain the flood water along its own basin, cut across elevated ground and joined the Malattar river. In the process it eroded the embankments to the road bridge on the National Highway at Arasur and completely washed away the railway bridge at the same place on the Madras-Tiruchirappalli Chord Line. Nearly a third of the district was under 5 to 6 feet of water for a period of about 4 days. Out of the total number of 2,203 villages in the district, 1,057 villages had been affected by the floods.

North Arcot District.

There were local heavy rains in the entire district on the 7th and 8th, of an order of 12 to 15 inches, which led to floods in the rivers Cheyyar and Pennaiyar and a number of breaches in the irrigation tanks. About 20 villages in this district along the banks of Pennaiyar, below the Sathanur Reservoir, had to receive the first impact of the heavy discharges from the reservoir and were very badly affected. All communication to these villages had completely been cut off for a period of about a week.

Salem District.

The places worst affected in Salem district were Salem Town, Attur town and the surrounding villages. The damages to Salem town were due to unprecedented floods in Thirumanimuthar river which winds its way through Salem town, which in turn was due to very heavy downpour in Yercaud area in Sheveroy hills, where the rainfall was of the order of 12 to 15 inches on the 8th and 9th. The damages to Attur town were due to heavy floods in Vasista Nadhi and other jungle streams emanating from the Kalrayan hills.

HEROIC RELIEF MEASURES

Chingleput District.

The rainfall in Chingleput district had been above normal during September to November and most of the irrigation tanks were nearly full. Further inflow from the heavy rainfall, of the order of 12 inches on the 6th and 7th December could not therefore be harnessed in these tanks, and a number of irrigation tanks had breached, which in turn breached a large number of roads. There was heavy discharge of water from Poondi Reservoir into Courtalayur river and this also resulted in breaches of tanks. Even Palar was in floods during this period as also Cheyyar.

Coimbatore District.

There was an unprecedented flood in Bhavani river due to the very heavy rains in the Nilgiris. Even though the discharge from Bhavanisagar reservoir was only 30,000 cusecs, the peak flow in Bhavani river at Bhavani on the morning of 9th December was 1,30,000 cusecs. This additional 1,00,000 cusecs was contributed by breaches in tanks and local rainfall. The floods washed away both the embankments to the bridge across the river Bhavani cutting off access to Bhavani town and joined Cauvery, thereby submerging a large part of Bhavani Town.

The Nilgiris District.

The damages in the Nilgiris district were due to local heavy rainfall resulting in a number of landslips and consequent damages to roads.

Dharmapuri District.

The damages in this district were mainly due to local rainfall and floods in Pennaiyar which received discharges up to 25,000 cusecs from the Krishnarajasagar reservoir. The other minor streams such as Vennar, Kallar, Koilar and Varattar were also in floods resulting in breaches to a number of minor irrigation tanks and consequent breaches to roads.

Tiruchirappalli District.

The damages in this district were concentrated in 2 places, namely, Gunasekaram in Musiri taluk and Labbaikudikadu in Perambalur taluk.



The floods in Gunasekaram were due to the Ayyar river which was in flood because of heavy rains in the Kolli hills. The damages in Labbaikudikadu were because of floods in Vellar river which received freshes from the heavy rainfall in Kalrayan hills.

Thanjavur District.

The worst affected areas in Thanjavur district were Pattukkottai and Arantangi taluks and a portion of Mannargudi taluk. The rainfall in this region up to the end of November was 25 per cent above normal. In addition to this there was heavy local rain on the 6th and 7th of December and the position was further worsened by the discharge of 2,20,000 cusecs on the 9th and 10th and 1,00,000 cusecs on the 11th from the Upper Anicut near Tiruchirappalli into the Cauvery Delta. This resulted in breaches to a number of channels and irrigation tanks, resulting in consequent breaches to roads.

Madras City.

The damages were mainly due to heavy local rains on the 5th, 6th and 7th December. Low-lying areas were affected destroying 34,000 huts. A number of roads have been badly damaged.

The cyclone and the floods resulted in the death of 81 persons in the entire State due to drowning, collapse of houses, fall of trees and electrocution. Of the 81 persons, 39 were adults and bread-winners of the families. Thousands of cattle particularly in the districts where there were floods in rivers, were washed away.

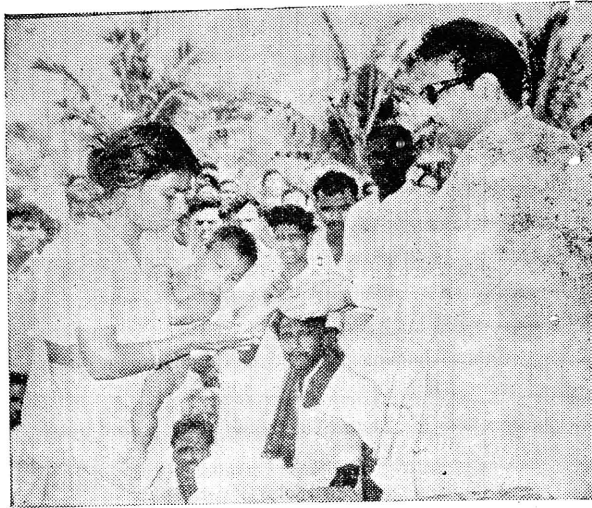
The floods also resulted in full or partial damage to as many as 1,70,000 houses in the entire State. A few hamlets on the banks of Pennaiyar and Gadilam have been totally washed away. Since the flood level did not subside

FLOOD RELIEF OPERATIONS ON WAR FOOTING IN SOUTH ARCOT DISTRICT.

In the first lap of his tour of flood affected areas in Tamil Nadu, the Chief Minister inaugurated the reclamation works at Pidagam, a village near Villupuram. As South Arcot is the worst affected district in the flood havoc, the Chief Minister has ordered that these relief measures be undertaken on a "war footing".

Then the Chief Minister visited Thiruvamur near Panrutti where Thiru T.V. Antony, I.A.S., the Director of Agriculture explained the reclamation process of sand cast lands by employing bulldozers.

During this function, blankets worth Rs. 7000 donated by the Pennadam Rotary Club were handed over to the Chief Minister. A sum of Rs. 7000 was given to the Chief Minister towards the flood relief fund on behalf of the local church on that occasion. The Chief Minister visited Kandarakottai, where people requested him to construct an anicut and also a bridge over Pon-nayai river near their village, as a safety measure against floods.



Cash grants to flood victims.

till the 12th of December, thousands of people in various districts living in low-lying areas were marooned for nearly a week.

Though the two major reservoirs in the region, namely, Sathanur and Bhavanisagar, were saved, the anicut across Pennaiyar at Tirukoilur was completely washed off and the anicut across Gadilam near Kallakurichi was considerably damaged. There have been breaches in as many 1,524 major irrigation tanks and 1,387 minor irrigation tanks in the entire State.

The breaches in irrigation tanks in turn led to breaches in communication lines such as roads and railways. For a period of 5 days, road and rail communication from Madras to the southern districts had been completely cut off.

Standing crops in 40,765 acre were totally destroyed. Considerable damage has been done to standing crops in 2,47,800 acres.

The floods in the rivers have also resulted in 4,000 acres of cultivable land being sandcast. Normal cultivation on these lands cannot be restored unless these sand deposits are desilted, which work was inaugurated by the Chief Minister on 23rd December 1972.

But for the immediate mobilisation of personnel of various departments, particularly from Madras City, the number of casualties would have been staggeringly higher. The Indian Navy also came to the rescue by making available a helicopter and this was pressed into service for rescue operations in South Arcot district. 4,319 persons were rescued to safety by these agencies. The persons who had lost their houses and their other belongings were housed in public buildings such as schools and offices, and arrangements were made to feed them till the water receded.

Private charity was also voluntarily and abundantly forthcoming to feed the marooned persons.

Under the rules in force all the families who had lost their houses were given immediate cash relief at the rate of Rs. 80 per family for re-building their houses and for purchase of clothing. This immediate cash relief was given to 1,70,000 families, of whom 88,000 were in South Arcot district alone.

The Public Works Department and the Panchayat Unions mobilised their staff within a very short period in order to close, wherever possible, the breaches in tanks temporarily by forming ring-bunds and by stacking sand bags.

The Highways Department was able to restore communications along all the important roads within a period of 3 to 4 days by making temporary improvisations. The Southern Railway did a magnificent job in restoring rail communication within a period of a week.

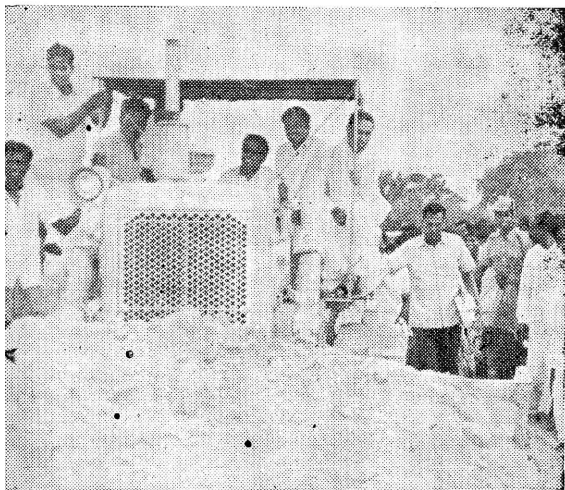
The Relief Programme.

After detailed discussions, the relief programme has been approved by the State Government. The salient features of the programme are as follows :—

A cash grant of Rs. 2,000 will be given by the State Government to the families which lost their sole bread-winner in the floods. In other cases of deaths due to floods, a cash grant ranging from Rs. 500 to Rs. 1,000 will be made available to the bereaved.

In addition to the immediate repairs to be effected to major and minor irrigation tanks by formation of ring-bunds, etc., so as to preserve the inflow of water due to further rains before the end of this month, immediate steps will be taken to restore the tanks to the conditions that existed before the floods so as to render them

Operation Flood Relief swings into action.



Clothings to the flood victims.

ready to receive water during the south-west monsoon of 1973.

Aids to affected farmers.

Agriculturists who lost their crops either partially or totally and those whose lands have been sandcast will need immediate finances for raising a fresh crop or to save the standing crops or to remove the silt on their lands so as to render them fit for cultivation. To the extent possible, the finances required by them will be made available through the Co-operative Banks. In respect of those who are not in a position to avail of co-operative finances for procedural reasons, the Government will provide necessary loan assistance directly. Twenty-five per cent of the cost of reclamation of the sandcast lands will be given as subsidy by the Government.

Most of the people who lost their houses are hut dwellers and will not be in a position to avail of co-operative finances for re-building their houses. The sum of Rs. 80 given to them as immediate cash grant in the wake of the floods will not be sufficient to enable them to re-build their houses and it will be necessary for the State Government to sanction loans not exceeding Rs. 250 to those who are in need of such assistance.

It will be necessary to make available fresh seeds to those who have lost their crops completely so as to enable them to raise a fresh short-term crop which will come to harvest before the middle of March 1973. Such seeds will have to be made available to them either free of cost or at subsidised rates.

Remission from land revenue and water cess, local cess and local cess surcharge has been ordered to be given in respect of the affected lands in all deserving cases.

The total amount required to implement the relief measures and repairs is estimated at Rs. 24-58 crores.

FORECASTING THE WEATHER

The recent spate of floods, droughts and cyclones in different parts of the country has once again drawn attention to the vulnerability of our agriculture and power resources to weather and the importance of weather forecasts for national development. The economic and social benefits of meteorology have attracted attention of economists and planners all over the world and weather forecasting has assumed greater importance than ever.

Early History :

In our country, weather forecasting on scientific lines commenced 97 years ago at about the same time as it started in Europe and America. At first, meteorological observations were confined to the surface of the earth and the oceans and forecasts were required mainly for mariners at sea.

Radio-sonde :

During the first half of this century, development of aviation led to the need for observations at higher levels in the atmosphere. The pilot-balloon, the radio-sonde and the radio-theodolite were developed for measuring winds and temperatures in the upper air up to as high as 20 to 30 kms. above sea level. In India, we have at present, 54 pilot balloon stations, 21 radio-wind; radio-sonde stations and the number will increase further during the next two years.

Radar :

Radar invented before World War II was quickly brought into meteorological use soon after, for detecting storms and determining upper winds. With the help of a shore-based radar, the dreaded tropical cyclone can be apprehended 400 kms. away, tracked as it approaches coast and people warned to protect lives and property, well in advance. In our country, the first weather radar was set up at Calcutta Airport in 1954 to warn aviators against Nor-westers or Kal Baishakis of Bengal. Ten such radars, each with a scanning range of about 250 kms. now operate at different airports. The first cyclone warning radar was located on Dolphin's Nose Hill at Visakhapatnam Port in 1970. Three more are coming up this year at Madras, Calcutta and Paradeep and next year at Bombay. By the end of the Fourth Plan period, a network of 8 cyclone

warning radars will keep a round-the-clock vigil for oncoming cyclones along our east and west coasts.

Satellites :

The radar was followed by the satellite and the first meteorological satellite was orbited by U.S.A. on April 1, 1960. This enabled the meteorologist to get an over-view of the world's weather no matter where it was located—land or sea. Pictures instantly transmitted to ground stations by the satellite revealed cyclones, monsoons and other phenomena in great detail. In India, we have 6 satellite monitoring stations for reception of cloud pictures from U.S. satellites. Similar pictures transmitted by USSR meteor satellites are received at New Delhi by radio facsimile from Moscow.

DR. P. KOTESWARAN,

*Director-General of
Observatories, New Delhi.*

Geostationary satellites orbiting at a height of 36,000 kms. have provided continuous weather watch capability over large areas extending up to a quarter of the globe. Two such satellites have been functioning over the Pacific and Atlantic Ocean for nearly five years. A geostationary meteorological satellite planned to be located over the Indian Ocean area by Japan in 1976 in co-operation with India would enable us to watch the development and movement of cyclones in our neighbouring sea area.

Developments in satellite meteorology during recent years have provided a break-through in bridging the gaps in our observational networks. By the end of this decade, the existing large data gaps over the oceans and uninhabited areas will be a thing of the past.

The Computer :

A third development that has revolutionised weather forecasting is the electronic computer. For decades, the meteorological forecaster had to content himself with qualitative deductions of future weather based upon manual analysis of pressure and wind patterns plotted

on charts. Although highly useful for many purposes, the technique has a large element of subjectivity dependent upon the skill, experience and intuition of the forecaster. During the last few years, however the computer has been successfully used to analyse the vast amount of meteorological data collected over large areas of the globe and predict cyclones and anti-cyclones, rain and snow on a quantitative basis. The computer has removed the element of subjectivity in weather forecasting and holds great promise in future.

In our country we have been producing experimental computerized forecasts thrice a week at Delhi. After a high speed computer is installed, these forecasts will be issued as a routine from early next year.

World Weather Watch :

These spectacular developments in meteorology have led to a World Weather Watch (WWW) project. It consists of a Global Observational System (GOS), Global Tele-communication System (GTS) and a Global Data Processing System (GDPS) operated by three World Meteorological Centres and a number of Regional Meteorological Centres over different parts of the world. New Delhi is a Regional Meteorological Centre (RMC) and a Regional Tele-communication Hub (RTH) for South Asia. The Centre will receive meteorological data round-the-clock from all over the globe with the aid of a computerized message switching system gifted by the Government of Netherlands, process the data with the aid of a scientific computer and disseminate forecasts by broadcasts at frequent intervals round-the-clock.

Research and Development :

A Global Atmospheric Research Project (GARP) jointly organised by the World Meteorological Organisation (WMO) and the International Council of Scientific Union (ICSU) is to begin its first global experiment in 1976. With all these research efforts, it should be possible to develop necessary techniques in the near future to issue accurate forecasts of the onset of the monsoon and floods and droughts associated with it well in advance for planning agricultural and power operations and help in the general economic regeneration of the country.

KNOW YOUR HEART

In the sophisticated society of the modern days, it is not a difficult task to know the status of one's Heart and its efficiency as a pumping organ, whose function is to supply blood to every nook and corner of the body. It is also essential to know the functional capacity of your heart so that you may live a life of moderation within the capabilities of your heart. A life of physical and mental strain will throw a burden on a diseased heart, which may be capable of serving an individual without any trouble and difficulty for a longer period. Even individuals with diseased hearts are capable of living a healthy existence, a normal life as an useful member of society provided he knows the condition of his heart. There are many individuals who are moving about in society, holding high positions in life, taking part in various activities, plying various trades, engaged in multifarious duties, little knowing the condition of their heart which probably may be diseased. If it was pointed out to them about the status of their heart, they would have taken more care in smoothening out their duties, in order to throw less strain on the heart or its muscle.

It is desirable for the purposes of living a longer span of life that the condition of the heart should be periodically checked up by simple tests which are available in all hospitals not exclusively for the rich but for the poor as well and to all categories of individuals. Such intermittent examination will be very useful as a preventive measure in safeguarding oneself from the complications which may later develop.

All heart diseases are not apparent to individuals, even though sometimes serious and threatening types of diseases are present, enigmatic and harmful to the life of the individual immediately or later. It is also a difficult task sometimes for a doctor, who is busy in his practice to detect heart disease off-hand. It may be so in certain types of heart diseases, where the

manifestations are gross but in the subtler types associated with minimal signs, even the most experienced consultant may have a doubt. This is the reason why sometimes there is a difference of opinion from doctor to doctor, not out of ignorance or incapacity, but because of the difficulties posed by the heart in the detection of its integrity and health.

FALSE IMPRESSION.

It is a false impression in the minds of the public that heart disease is always associated with a grave situation, always threatening the life of the individual, like the sword of democles hanging over his head. This impression has been created by individuals who have an unsound knowledge and a smattering of wrong type of medicine. Moreover, the many deaths which occur suddenly, as reported in the daily news paper creates such a feeling in the minds of the public which should be erased by proper explanation and guidance by those who have a thorough knowledge about heart disease. It is also not correct to visualise that an individual with heart disease is one who is incapable of moving about in society, doing his normal work; that he should be confined to bed with gross symptoms like breathlessness, swelling of the feet, cough, etc., which are a few symptoms of the complications of heart disease but not of the heart disease itself.

It is only when heart disease advances to a serious stage that such complications are liable to occur, and even at that stage treatment is possible with rectification of the complications. It is no exaggeration to say that individuals who have passed through such complications have outlived their lives and are still healthy because they have come to know the condition of their heart and are living within its functional capacity.

Unnecessary care.

There are several varieties of heart diseases occurring at different periods of life. Heart like any other organ in the body is subject to almost the same disease as those organs and therefore to create a panic in the minds of public about the seriousness of heart disease is incorrect and leads to many neurotic and psychotic disturbances. Individuals become afraid of their heart and are constantly worried as to what

DR. K. RAMACHANDRA,

*Prof. ssor of Medicine,
Madras Medical College,
Madras.*

would happen to them. There will and capacity to work with efficiency becomes affected and they lead an unhappy and sedentary existence.

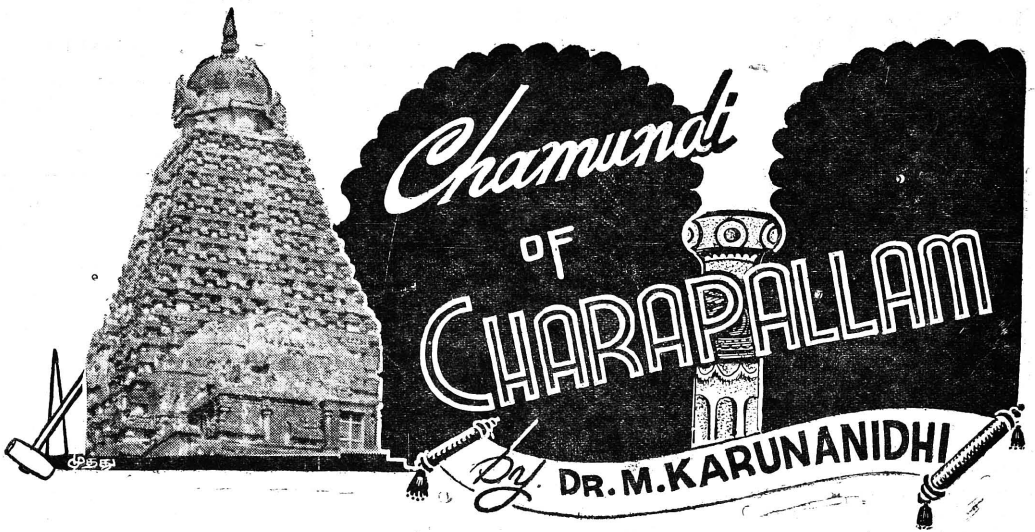
Heart diseases are sometimes complications of their bodily ailments and individuals may not succumb to the primary disease but from their heart complications. Heart diseases may be developmental having occurred even in the mother's womb due to many infective and atavistic factors which can easily be detected. There are other diseases which develop later in life. Amongst them a few, are the Rheumatic Heart disorders, Hypertensive Heart disorders, Diabetic Heart disorders, Arteriosclerotic Heart disorders have to be mentioned barring many more conditions which are uncommon. In such diseases which occur in childhood, adolescence and old age, it is necessary to know the condition of the heart.

Preventably managed.

An individual with Hypertension, Diabetes, etc., by knowing his disease and the damage which has already occurred to the heart can by proper management at the hands of a competent person, maintain a healthy body and active mind with sound advice and little medication, though drugging has become a fashion of the present day, which is often not necessary.

All that is needed is that every individual whatever be his age, status and position in life should periodically have not only his body checked up but particularly his heart. It is not necessary in the present day that once a heart disease always a heart disease. To a great extent this dictum has been altered after the advent of Surgery and better understanding about diseases of the body in general and the Heart in particular. I would even say that individuals with heart disease of a particular type when detected early can live a vigorous healthy existence.

*Courtesy, A.I.R. from a
broadcast on 18th Decem-
ber 1972 from Madras
A.I.R. by the Author.*



"After all she is only on a visit to Mummudi Chalapuram now—shall I go and fetch her?" asked Rajendran, Challengingly.

Kundhavaiyar smiled as she arbitrated! "She would be here tomorrow and so you two could adjourn your argument!"

Rajendran protested, "Auntie, Father is accusing me of lack of ardour for Art, do you support that?"

"How could I?" said the aunt, "on many an occasion has it been brought to my attention that your wife Parthavan Madevi dances, as you sing the appropriate Lyrics."

The nephew flushed at Kundhavaiyar's good-humoured riposte.

DELINEATION OF DANCE SUPREME.

The Emperor brought the discussion back to the agenda. "Kandradhitta, let me not forget what I had wanted to say, on account of these digressions. All of you are aware of my fervent interest in the seven forms of Dance demonstrated by the Lord. We have to arrange for the dance-postures of the Lord to be carved on the inner lower tier of the ceiling of the temple we are constructing. The dance-delineating are 108 in number and so there must be as many distinct sculptures. Everyone of the sculptures should be an eloquent epitome of the life and energy of Art. Let us not bother about the expenditure on this account. A master-sculptor has to be selected straightaway. It is your primary and paramount duty,

Kandradhitta, to see to the fulfilment of this desire of mine", said Raja Rajan with intense feeling. Awed by his eagerness and concern to install the 108 sculptures, Kundhavaiyar and Rajendran could hardly contain their emotion.

After many such definite plans and ideas had been discussed, Kandradhitta assured them that he would get down to work straightaway and he took leave of them. The Emperor then summoned the Commander, one Krishnanan Raman alias Mummudi-Chola-Brahmarayan and allotted to him the work of constructing the outer precincts of the temple.

MONUMENT OF VICTORIOUS ART.

Both Kandradhittan and Brahmarayan set about their tasks with energy and enthusiasm since they were eager to conclude the work of constructing Raja Rajecharam within a period of four or five years. Competent sculptors from all over the country were brought to Thanjavur. Rocks were fetched in massive consignments so that the several construction-works may proceed steadily, the Emperor made out an edict donating 35 towns to the temple. Four hundred artists were settled in colonies to the north and south of the temple-site. These damsels were proficient in music and dancing. In addition were brought pipers, drummers and others who could play a variety of percussion instruments and stringed instruments, for service in the temple. Land to the extent of one

veli was settled on each of them. Recruitment was arranged for the posts of priests, clerks, garland-makers, lighters and watch and ward. Long before the construction of the temple was completed, the entire staff for the maintenance had been assembled and trained, and all the other requirements anticipated and provided for. Such was the solicitude of the Emperor.

In order to have a look at the monument of victorious art characteristic of the Chola Empire, innumerable tourists from all parts of the sub-continent gathered at Thanjavur day after day. The capital city of the Cholas sported a look of permanent festivity.

OLD LADY'S DEVOTION.

The visitors came and returned in waves and not a day passed without new-comers literally swarming Thanjavur to observe the grandeur of the construction in progress.

But there was one grey-haired and wizened old lady who used to turn up without fail at dusk every day. She would come herding a few sheep and stand at a particular spot to gaze with devotion at the Temple under construction. Only when darkness had fallen would she leave the place accompanied by her sheep.

Her tresses were grey but she had combed and tied them up neat. Her age would have been near about seventy but she needed no staff to lean on. It could be seen that she was used to hard work. As she gazed at Raja-Rajecharam slowly rising towards the sky, a radiance would come over her wrinkled

features. It could also be inferred that her eye-sight was keen, since even from quite a distance she could make out the details of the work of the sculptors and other artisans.

Having observed the regularity of her appearance and the zeal she evinced in the lofty task of Temple construction, some of the sculptors approached her one day and proceeded to make her acquaintance.

They gathered that she made a living by rearing sheep. Her name was Azhagi and she resided in a hamlet four miles from Thanjavur.

"Why so much enthusiasm at this age, grandma?", asked a youthful sculptor, somewhat provocatively.

The ripened fruit answered with a sign "This work of Emperor Raja Rajan would be pronouncing the name of Thanjavur for all generations to come. My only anxiety is, in what manner will I be able to contribute my share to this noble endeavour?"

Another sculptor asked rather slightly: "Thousands and crores in terms of gold and other articles are being poured in, to bring up this magnificent construction. How

could one like you who rears sheep, be of any help, grandma?"

This was more than the old lady could stand. But curbing her indignation she looked the irreverent sculptor straight in the eye. Oh, how penetrating was her vision! Unable to meet her gaze, the sculptor bowed and shuffled away, shame-faced.

For many days the struggle had been taking place in her mind. Her unquenched desire was to contribute her share to the historic work of Temple construction. But at this advanced age, what more arduous task she could engage herself in other than herding sheep? Could she transport rock to the masons raising the walls? Did she have adequate strength in her to fetch water in the pitcher, for the purpose of mixing earth? She was, however, determined that she should render whatever little help she could to the splendour and stature of Raja-Rajecharam that would scrape the very skies and announce for all time to come the valour and victories and the noble and sagacious deeds of Raja Rajan who had been described as the very Sun of the Chola Empire. What she could not immediately decide was the form of her possible assistance.

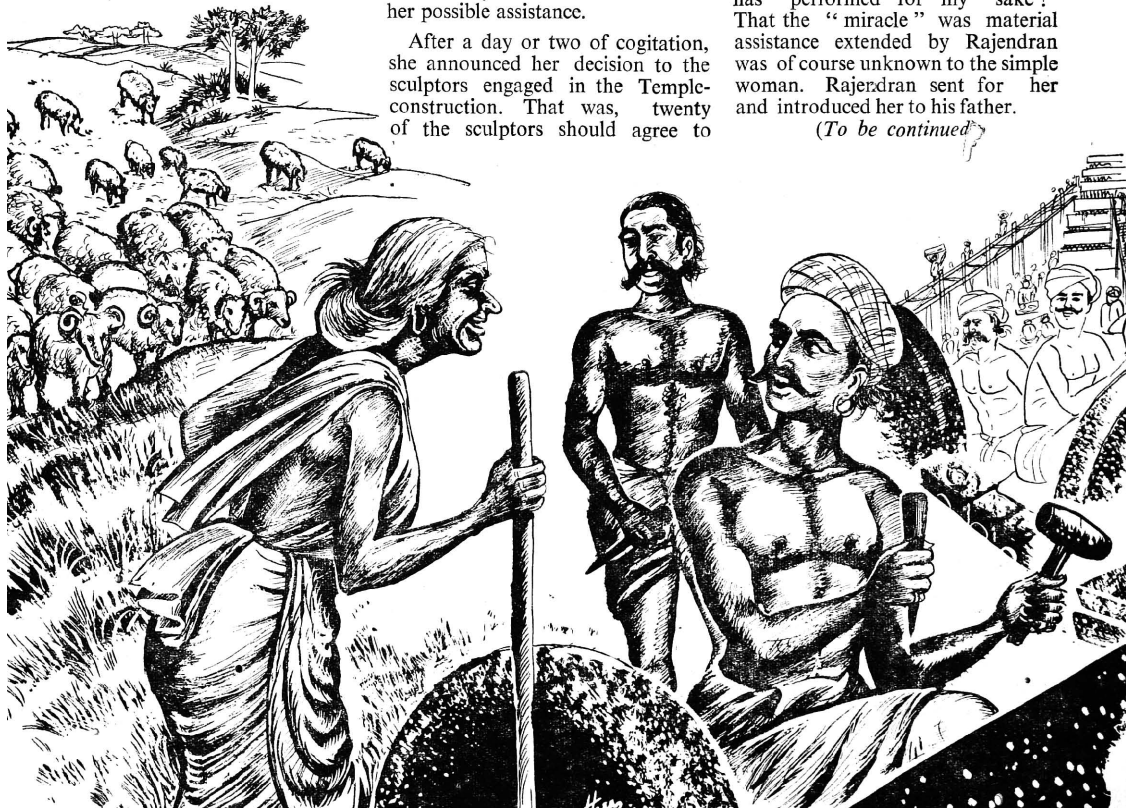
After a day or two of cogitation, she announced her decision to the sculptors engaged in the Temple-construction. That was, twenty of the sculptors should agree to

partake of the food that she would provide. Twenty sculptors would take turns being her guests since she was in no position to provide food for the entire lot. The sculptors who had by then understood her feelings as also her sincerity and the love and affection she had for the Chola Country acceded to her request. Very soon the sculptors started looking forward to the dinner at old Azhagi's residence. They did not fail to observe that the strength of her flock of sheep was being steadily attenuated. It was clear that only by selling the sheep was she able to find the means to provide food to the sculptors.

Emperor's Gratitude.

The fact that her sheep-wealth was getting depleted did not seem to have caused her any concern whatsoever. When one day Rajendran had come to have a look at the Temple-construction, the sculptors told him about the old lady Azhagi and they spoke in very appreciative terms of her pure affection and duty-consciousness. The very next night a thousand sheep were left in front of her humble abode. Espying the flock at dawn, Azhagi almost danced in joy exclaiming "O, what a miracle the good Lord has performed for my sake!" That the "miracle" was material assistance extended by Rajendran was of course unknown to the simple woman. Rajendran sent for her and introduced her to his father.

(To be continued)



SOCIALISM AT ANY PRICE

—ASSERTS

The Chief Minister

"We are here only with the support of the people, and we are prepared to ever serve and work for the people who elected us with great confidence in us and we are for carrying out our duty to fulfil their desire".

Replying to the debate on the Confidence Motion, in the Tamil Nadu Legislative Assembly, Dr. Karunanidhi vowed to usher in a classless socialist society against all odds, tribulations and objections. The Chief Minister further said :

"This Confidence Motion has given adequate opportunity to the opposition to express its views on various problems and raise their objections and the Opposition Leaders Dr. Hande and Thiru Ponnappa Nadar have spoken for hours detailing their view points on many issues. The purpose of the Confidence Motion was nothing more than giving the opposition members enough time to vent their opinions and have open discussion on problems concerning the public. It is also an opportunity for the opposition parties to table their objections and accusations. I extend my gratitude and compliments to the 24 Members of the House who participated in the debate on the Confidence Motion. Though most of the expressions and opinions of the opposition parties were barbed attacks against this Ministry and were meant to hurt we have had the guts and forbearance to face and tolerate such expressions and accusations. Thiru Ponnappa Nadar said that this Motion was moved with some inner motive. I must tell him that there is no motive behind the motion and this Ministry is not at all afraid of any No-Confidence Motion against it. As a matter of fact this Confidence Motion was meant to give the opposition an occasion to voice what all they would have wished to express on a No-Confidence Motion.

"We must realise how the confidence in this Ministry can be tested and by what standard it can be tested.

The charges levelled here by the opposition have all along been raised on public platforms for the past two years. These charges were highlighted in journals also.

"The charges have already been refuted. But over and over again they are raised and nothing new is there in these charges. There is a convention as to what could be said and how it should be said in this House. When the charges are levelled before the House, we have never been so arrogant as to disregard those charges or the members who levelled them. Nor shall we ever be indifferent to any Member of this House. Whoever may be raising charges, we have been patiently listening to them. I assure the House again and again that we will continue to always respect the opposition as ever before.

OUR ACHIEVEMENTS.

"The opposition must see what we have achieved in these five years. What is it that we have failed to do ? Have we not fulfilled our election promises ? Let us compare Tamil Nadu with all the other States in India. The difference in development before and after the present regime assumed office must be noted. Arignar Anna assumed office as Chief Minister and formed the Cabinet in 1967 and the present Ministry follows in his foot-steps. If we compare the development of Tamil Nadu with that of other States after the present regime assumed office, the progress under this regime can be distinctly noted.

"Let us see whether this Government has rendered benefits to the depressed people, the backward Classes, the poorer sections, the workers and peasants. What is the measure by which the merits and quality of a Government can be evaluated ?

"Dr. Hande reminded us here that he would not think that the Government has the support of the people just because there is a strong majority in favour of the Government in the Assembly. He also said that Ninety out of a hundred or Nine out of every ten—of those outside the Assembly do not support the Ministry. Whether in Parliament or in the State Legislature, it is only by the number of the legislators that the strength of the Government is decided. But Dr. Hande does not approve of this standard and measure. He is himself a doctor and he knows that the intensity of fever is indicated only by a thermometer. The degree of support to this Government was indicated by the electoral thermometer in 1971.

Dr. Hande : "Your Thermometer is old now.

Chief Minister : "Whether our thermometer is old or new can be tested when Dr. Hande starts suffering from fever.

"Therefore, it can be decided whether this Government has support or not only by the support of the Legislature. Both in 1967 and 1971 people voted us to power and supported us. They made it clear that in 1971 they have greater confidence in us.

FOR TAMIL AND BY THE TAMILS.

"We are here only with the support of the people, and we are prepared to ever serve and work for the people who elected us with great confidence in us and we are carrying on our duty to fulfil their desire.

In his reply to the debate on the Budget, Anna said that his Government would evolve and implement schemes based on the needs of the depressed the backward, the middle

and poorer classes of the society. He indicated that the Government, should be for Tamil and by the Tamils.

“Under Anna’s regime Tamil Nadu came to have her own historical name and the ‘Madras State’ was christened ‘Tamil Nadu’. The whole Legislature was elated with bliss on the day when Tamil Nadu was christened by Anna. And to-day Mysore State has followed Tamil Nadu and has assumed her own name ‘Karunatakam’.

“The Anti-Hindi agitation has been going on since 1937 and it was under Anna’s regime that a way was found to stop the agitation by passing the Two-language resolution to check the onslaught of Hindi. It must be remembered that these were done only under our regime. The self-respect marriages were accorded legal recognition under the present regime.

“Taxes on Dry Land and the Rain-fed Land were cancelled in our period and even the wet land upto five acres was exempted from taxation under this regime. Further, land upto one ground in the city was exempted from the Urban Land Taxation. We are proposing to grant more concessions regarding land in cities.

“It was this regime that reduced the land ceiling from 30 acres to 15 acres from 15th February 1970. The exemptions on sugarcane land, estates, grazing land and dairy farming were all cancelled by this Government. A ceiling on trust land also was fixed by us. The purchase of land for religious trusts have been legally forbidden since 1st March 1972.

“The crash programme for illumination of all villages is being zealously implemented with the co-operation of the Minister for Electricity and the Electricity Board. There are 61,393 villages all over Tamil Nadu. Of these only 20,250 villages had been electrified from 1933 to 1967 during a period of 34 years. But during a short period of 5 years 38,474 villages have been electrified. Only 3,847 villages remain to be electrified.

“The total number of Harijan colonies all over Tamil Nadu is 23,096. Till 1967 only 4,354 Harijan colonies were electrified. But

within a short term of 5 years 18,036 of these Harijan colonies have been electrified.

“The Beggar Rehabilitation scheme was undermined by many people. But when no other State has dreamt of such a noble scheme, it was Tamil Nadu that sought to implement the Beggar Rehabilitation. Beggary is an ignominy to society and it must be dealt with properly and should be done away with. This Government has not neglected even beggars. We have wholeheartedly devoted to this cause and Beggar Rehabilitation Centres have been opened at four places namely Peranur, Ulundurpet, Bargur and Pudukkottai. Similar Centres will be opened in Thanjavur, Salem, Dharmapuri, Madurai and Tirunelveli this year. About 5,000 leper-beggars will be rehabilitated in these centres. After arranging for the rehabilitating the leper-beggars, schemes will be launched for helping other beggars to earn and live decently.

“The Eye-Camp has been criticised much as a scheme launched for publicity. This programme must be more publicised because many needy people remain unaware of the facilities afforded under the eye-camp programme. According to the statistics collected by the Health Minister Prof. Anbazhagan, there are 10 lakhs of blind people most of whom are older. With the purpose of helping one lakh of these people this year, the eye-camp was launched and 26 camps have been conducted so far.

“I am glad that the opposition leader has at least recognised the necessity of these camps. In these camps 1,22,555 persons were treated as outpatients and 19,697 had the operations done and were given spectacles after the operation. Public contributions for this scheme have so far totalled Rs. 50 lakhs and Rs. 11 lakhs has been spent.

“Though this fund was collected from my birth-day the fund has not been deposited in my name. This fund is kept in the Government’s account.

“In order to employ in useful service the frustrated unemployed young graduates, the Government formed the youth corps in Tamil Nadu. Under this programme

2,729 men-graduates and 258 women-graduates have been employed to render social services. They impart adult education and propagate scientific and hygienic knowledge among the villagers and render practical help to the peasants.

“Similarly the Prosperity Brigade initiated by Anna has been rendering commendable services.

Uplift of Harijans and Backward Classes—

“We are much interested in uplifting the depressed Harijans. The allotment made for Harijan Welfare during 1966-67 was Rs. 3.5 crores whereas the amount allotted in 1972 is Rs. 8.5 crores. There are some who ask what we have done for Harijans and they also say that Harijans have been disappointed. They might have attempted to accuse me of helping the Backward Classes because of my belonging to the Backward Classes. But nobody can have such doubts and none can accuse me so now. As pointed out by Thiru Balasundaram here, my family has come to have matrimonial alliance with Harijans.

“For the Backward Classes, the Government allotted only Rs. one crore in 1967. In 1972 the allotment has been raised to Rs. 4.5 crores. A separate Department has been set up under an individual Minister for the Backward Classes. Recently, I and the Backward Class Minister Thiru Rajaram were welcomed and complimented by the Backward Class people in Salem. In accordance with the recommendations of the Backward Class Commission about 15 communities have been included in the list of Backward Classes. In 1967 there were 11 hostels for Backward Classes, but to-day there are 145 hostels for Backward Classes. Within a period of five years 134 hostels have been opened for Backward Classes by the present Government. Regarding the allotment in appointment the percentage for Harijans has been increased from 16 to 18 per cent and for the Backward classes it has been raised from 25 to 31 per cent.

“What great revolutionary change has been effected in the social sphere can be realised only with reference to the previous state of the

depressed classes in the past. Harijans have been at times given chances to become members of Trust Boards of Temples. But now, it has been ordered by the Government that one of the trustees must be a Harijan.

"Above all, our Government has hammered the very foundation of caste system by helping even Harijans to become priests. These revolutionary steps have been taken only by this Government and no one can forget this.

GOVERNMENT EMPLOYEES :

"The personal file-system was much disliked by the N.G.O's. and their desire to have it abolished was fulfilled by the Government. The personal file-system was abolished in keeping with Anna's promise to do so.

"The Government appointed the Second Pay Commission and duly implemented the recommendations of the Commission and raised pay at a cost of Rs. 21 crores. Again when it was brought to notice that there were some anomalies in pay scales, the Government came forward to incur Rs. 5 crores more to satisfy the employees.

FARMERS :

"The Government has allotted to Farmers as Short Term and Medium Term loan Rs. 57.34 crores during 1971-72 whereas the amount allotted was Rs. 31.45 in 1966-67. The Long term loan in 1971-72 has been raised to Rs. 25.42 crores from Rs. 2.93 crores in 1966-67. Such huge sums have been granted to farmers thanks to the sincere efforts of the Minister for Co-operation and we have won the support of the farmers. Though some politicians tried to misguide farmers and to rouse them against us, the farmers are aware of the assistance and other facilities extended by the Government. This is evident from the failure of some who attempted to instigate farmers against the Government.

EDUCATION :

"The allotment for education in 1966-67 was Rs. 44 crores whereas it has more than doubled itself to Rs. 99 crores in 1972-73. When the amount spent on Harijan Welfare Schools and Medical Colleges, is

also added the total allotment for education totals Rs. 133 crores.

"In 1966-67, there were 105 Private Colleges and in 1972-73 there are 176 Private Colleges. Government Colleges have increased to 49 in 1972-73 from 27 in 1966-67. Thus during the 5 years, 79 colleges have been opened providing college education to 2 lakhs students against barely 94,000 in 1966-67. The number of Elementary school pupils was 50 lakhs in 1966-67 and it has increased to 57 lakhs in 1971-72. The number of high schools rose to 15,400 in 1971-72 from around 13,400 in 1966-67.

"There were 3 evening Colleges in 1966-67 educating 520 students. In 1972-73 there are 32 evening Colleges and the number of evening college students has to-day increased to 9,000 from 520. Education has been made free upto P.U.C. These are all our achievements in the field of education.

SLUM CLEARANCE :

"The Slum Clearance Programme launched in Tamil Nadu is appreciated by other states and they want to follow us.

"The people who were once living in slums are now living in storeyed buildings. We feel elated when we see those slum-dwellers now living in mansions.

"Even if we were to see our Chola Kings in their royal robes we won't be so elated as we are while seeing the slum-dwellers live in mansions.

"Look at the elegant buildings constructed for the slum-dwellers at Ayodhyakuppam, Kotturpuram and Viyasarpadi. A seven-year plan has been evolved for implementing 63 schemes under the Chairmanship of Thiru Rama Arangannal and it has been proposed to construct 23,232 tenements. Of these, 4,590 have been completed. 7,897 are under construction and 10,745 are at initial stage. This scheme has been praised by Thiru Jeyaprakash Narayanan, many Chief Ministers and Ambassadors and many just-minded persons.

Ponnappa Nadar : Is it true that Prime Minister Indira Gandhi refused to participate in a Slum Clearance function.

Chief Minister : "She did not refuse to participate. There were many programmes for her and she could not find time to participate in this function. Only such minor things are made much of by some people when a noble scheme is implemented.

"To me all those who live in slums are Indiras. I regard the mothers who live in the slums as my mother. I regard the slum-dwellers as my brothers. I find solace in the fact that we are able to do at least this much for the poor. But, Thiru Ponnappa Nadar is worried about the persons who participate in the functions. Thiru Ponnappa Nadar must participate in such functions and see those poor people who are helped to live in the newly built mansions. The Slum Clearance work is in progress in the constituency of Dr. Hande and he must also participate in the inaugural function of the tenements there.

MASS-CONTACT PROGRAMME:

"The villagers had to go to Government Offices and wait at offices for meeting the officials. But we have changed the situation to-day. The mass-contact-programme was initiated at Ramnad district in 1967 and it has been launched throughout the State.

The officials go to villages on a particular day every month and they visit about 1,500 villages on a single day, receive petitions from people and seek to redress their grievances immediately. This Mass-Contact-Programme (Manuneethi Thittam) is effectively carried on throughout Tamil Nadu."

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Intensive Family Planning Campaign in Tamil Nadu

The population of the State of Tamil Nadu according to 1971 Census is 41,103,125. This population accounts for 7.51 per cent of India's population. In 1951, the population amounted to 8.34 per cent of India's population, but in 1961 it amounted to only 7.67 per cent. Thus in the per centage of population to the total population of India, Tamil Nadu ranked 5th in 1951, 6th in 1961 and 7th in 1971.

Tamil Nadu did about 2 lakhs of sterilizations during the last Year's Intensive Family Planning Campaign period alone and in the rest of the normal period did about 45,000 operations. Totally, last year performance was 2 lakhs and 45 thousands.

During the last year campaign Thanjavur District put up health resorts and conducted the campaign in an organised manner. But all the districts were not adhering to the Thanjavur pattern, what we now call the "Welfare Package Model". It has been well appreciated every where in India that the Thanjavur pattern is the welfare model. According to this pattern, the vasectomised father was kept for six days in a Health Resort. The Health Resort was usually a School Building or a Kalyana Mandapam or in some places, even Government Hospitals where larger number of operations were taken. The people were operated aseptically and were kept in the Health Resorts for six days giving them nice and nutritious food and they were treated with drugs and injections so that complications of any sort were avoided. This was tried first in Thanjavur in May-June 1971. The performance was about 4,500, exceeding the target of 2,000. This was repeated in December 1971 and January 1972 with a target of 15,000 and the performance was 21,000. The people operated were all satisfied, and they themselves brought many cases during the same campaign period.

This year the Government of India have accepted the "Thanjavur Pattern" as a model in the field of Family Planning and they in appreciation of it, have given an award to Tamil Nadu. The award was given in Hyderabad Family Planning Council Meeting, recently held on 1st and 2nd of November, 1972. This year the campaign follows the Thanjavur pattern in every district where it has been

inaugurated. The expenditure per case under this pattern comes to nearly Rs. 110. The Government of India have come forward to give Rs. 100, for a case of vasectomy alone in the campaign period and the Government of Tamil Nadu gives Rs. 10 towards motivation fee. The break up for Rs. 110 is as follows :—

	RS.
For Motivation	10
For Vasectomised father.	60
For Drugs and Dressings.	10
For Diet, Publicity and arrangements of Health Resorts.	30
	110

In the first instance this year, the campaign was started in six districts :—

- 1 Chingleput district.
- 2 North Arcot district.
- 3 Coimbatore district.
- 4 Tiruchirapalli district.
- 5 Ramanathapuram district.
- 6 Tirunelveli district.

The Government of India have fixed 1,20,000 operations as target for the above six districts. The actual service period was started in September 1972. At that time as it was raining everyday the campaign could not get momentum as expected. Subsequently it gained momentum. In five districts the campaign was conducted upto 15th November 1972. In North Arcot District alone the campaign was conducted upto 30th November 1972.

The targets for the districts and the dates on which the Service period of the campaign started are given against the districts concerned :—

Districts.	Target.	Date.
Chingleput	16,000	16th Sep. 1972.
North Arcot.	25,000	1st Oct. 1972.
Coimbatore	18,000	12th Sep. 1972.
Tiruchirappalli.	25,000	15th Sep. 1972.
Ramanathapuram.	15,000	16th Sep. 1972.
Tirunelveli ..	25,000	16th Sep. 1972.

The Intensive Campaign in the District was held under the Chief Leadership of the District Collector. The District Family Planning, Maternity and Child Health Officer, with the help of the District Medical Officer, District Health Officer assisted the District Collector in conducting the campaign.

The Mass Education and Information Officers from other districts came on deputation, assisted him and made the publicity campaign a successful one. The District Public Relation Officers of the Government of Tamil Nadu and the Field Publicity Organisations of the Government of India extended their co-operation and assistance in this regard.

All traditional medias were fully utilised to educate the masses. To put it in a nutshell publicity was both extensive and intensive. Public Meetings, mike announcements, display of banners, and buttings, Radio and Press involvement, distribution of leaflets, booklets, etc., were fully planned and arranged.

Health Resorts :

In this campaign, most of the Health Resorts were put up in the Offices of the Panchayat Unions. The Panchayat Union Commissioners have shown great interest and done their best for the success of the campaign with the help of the Block Staff and the staff members of the Primary Health Centres.

No Religious Bar :

In almost all the districts it is found that the Muslims and Catholic Christians have undergone sterilization operations. Particularly some about 30 Muslim fathers from Thulukkapaalayam village, Arkonam Panchayat Union, North Arcot District have undergone the operation, with the concurrence of their Haji Bhakshi Sahib. Further Haji Bhakshi Sahib himself has undergone the operation and accepted the "Small Family Norm".

District.	Target.	Achievement.	Percentage.
Chingleput district ..	16,000	32,420	202.7
Coimbatore district ..	18,000	21,702	120.5
Tiruchirappalli district ..	25,000	25,008	100.0
Tirunelveli district ..	25,000	21,878	87.5
Ramanathapuram district ..	15,000	10,682	71.2
North Arcot district ..	21,000	15,677	74.7
		127,367	

Mr. Saminathar, a Roman Catholic, Vice-Chairman, Vayyampatti Panchayat Union in Tiruchirappalli District has shown great interest in motivating the eligible fathers for Vasectomy operation. On his motivation, 20 Roman Catholic Christians from Karungulam village underwent the operation. It shows that there is no religious bar for undergoing sterilization operation.

Great Achievement of the Coimbatore Municipality :

It has been the past experience that the performance of Corporation and Municipal areas was decidedly poor. But Coimbatore Municipality is an exception to that.

Thiru John Alexander, a Roman Catholic, Commissioner of the Coimbatore Municipality is a very devoted and dedicated worker in Family Planning and he bagged three or four prizes in places like Pudukottai, Thanjavur, etc., where he had been the Municipal Commissioner.

Following the Thanjavur pattern, he converted the Municipal Maternity Homes into Health Resorts where the operated persons were kept and almost all of them kept on beds and treated as V.I.Ps. With his work and the co-operation of the Coimbatore Municipal Chairman, Thiru A. A. Sukkoor and all others concerned, he has been able to do in this campaign period alone 3,125 sterilizations.

It is an unique example not only in our State, but also in India taken as a whole where a Municipal Commissioner has arranged for 3,125 Vasectomies in an urban area like Coimbatore.

Achievement :

The target for the six districts is 120,000 sterilization operations. During the intensive campaign period 127,367 operations were performed and thus exceeded the target. The break up for this is as detailed below:—

Visit of Assessment Teams.

One Maharashtra Team consisting of the Director of Health Services and Family Planning, Gujarat, Director (Planning), Family Planning Department, New Delhi, Deputy Secretary and some other statisticians headed by Thiru J. A. Ambasankar, Secretary to Government of Tamil Nadu visited the districts to assess the campaign and also the running of Primary Health Centres. The assessment team paid visits to Chingleput, Tiruchirappalli and Ramanathapuram districts.

Dr. M. D. Sharma, Assistant Commissioner (Family Planning), New Delhi, toured in Chingleput, Tiruchirappalli and Tirunelveli districts.

Both the teams have expressed complete satisfaction of the method, aseptic surgery, as well as the maintenance of the Health Resorts.

Now the Intensive Family Planning Campaign is being implemented in Thanjavur, South Arcot, Salem and Madurai districts. The total target for these four districts given by the Government of India is 83,000:—

South Arcot district ..	18,000
Madurai district ..	20,000
Salem district	15,000
Thanjavur district ..	30,000
Total ..	83,000

The service period is going on in South Arcot, Salem and Thanjavur districts preceded by a month's publicity in November 1972. Madurai district will be taking up the service period from the 1st February 1973 preceded by the publicity drive.

It is hoped that the target will be exceeded by the four districts and a minimum one lakh of operations is expected to be done by these four districts during the campaign period.

Give strength. Greater achievements will be expected in the years to come.

COMPUTERISED EXAMINATION PROCESSING

1972—the Silver Jubilee year of our Independence marks an important milestone in the annals of Secondary School Education in Tamil Nadu. For the first time, an Indian made Computer I.B.M. 1401 was used to process the work relating to the S.S.L.C. examinations held in October 1972. This is of great significance to all concerned the authorities entrusted with the job of conducting the examinations, the students and their parents.

Why use a Computer for examination work? Because, with over 2 lakhs appearing for each examination, all steps have to be taken to publish results quickly avoiding all chances of human errors to crop in.

Very elaborate administrative preparations are required for each S.S.L.C. examination. These start several months before the actual examination dates. Careful attention has to be paid at every stage to ensure no one detail is missed. The work continues for weeks after the examination as well.

Of late, the work has assumed enormous proportions since the number of students appearing has been sharply going up year after year.

Year.	Number of students.	Number of centres.
1957 ..	59,267	412
1962 ..	73,320	480
1967 ..	1,87,699	982
1972 ..	2,08,463	1,130
1973 ..	2,25,000	1,200
March (approx.)	(approx.)	(approx.)

This is the case in other States too. The number of students in one examination conducted by Patna Board was over 3 lakhs and by Allahabad Board 8 lakhs last year. However, the Examination Boards get the same time as in the years past to complete all the work.

The results should be announced as early as possible after the examinations to enable the students to apply for higher courses which have their own prefixed dates for applications. These serious limitations throw enormous strain on the administrative machinery.

THE BIG PROBLEM.

There are other problems too. The most disconcerting concern of the Examination Boards is to ensure complete secrecy till results are announced and to guard against malpractices. As the number of students goes up, so does the number of staff required to manage the increased workload. Ensuring secrecy and preventing malpractices become big problems.

S. V. CHITTIBABU,
Director of School Education,
and
N. BALASUBRAMANIAN,
Systems Engineer, I.B.M.

Further, as in banking, the examination work demands extreme accuracy. The results have a direct bearing on the students academic or professional career. Errors will, therefore, have serious consequences. The immense workload arising from the very large number of students and subject combinations and further aggravated by the short time available for completing the work, makes ensuring of accuracy a challenging job. A commission set up sometime back to study the examination work in a State said "accuracy (in manual processing) could be ensured only after fifth or sixth checking which is perhaps seldom done. Errors would cause incalculable harm to the candidates and bring the University into disrepute.....mechanisation alone is a solution to the problems. But if this is not to be,

with all its attendant evils." This is where the computer comes in. Its inherent characteristics, viz. high speeds, accuracy and logical capabilities make it an ideal solution to the aforesaid problems.

Speed—Computers work at electronic speeds. the I.B.M. 1401 Computer used for processing the October 1972 S.S.L.C. examination work has an internal speed of 11.5 micro seconds (micro second million of a second). In other words, it can read approximately 87,000 characters in one second. The input-output devices attached to it are also very fast. It can write date on magnetic tapes and read back at the rate of 41,700 characters per second. Its printer can print 600 lines per minute. These high speeds help to tackle enormous work loads arising from the large number of students taking the S.S.L.C. examinations. They also absorb the ever increasing work load with very little extra effort. An increase from 2 to 3 lakhs of student population will break down the manual system but will result in only marginal increase in the processing time of the Computer.

The high speeds also solve peak load problems by finishing the work in record time and make it possible to meet the very tight schedules prescribed for the examination work. **The students can have their mark lists and certificates soon after the results are declared to enable them to apply for higher course in time.**

SECURITY: The computerised method ensures complete secrecy. The system design for processing is such that no one will be aware of the results until the final results of all the candidates are available and ready for despatch to the Press. The marks, soon after their receipt from examiners, are written by the Computer on to magnetic tapes. These tapes are used for all subsequent processing work. The information on tapes is accessible only to the Computer and invisible to the human eye. This automatically ensures secrecy.

The concept of "fictitious roll numbers" adds a new dimension to ensuring secrecy. This process involves assigning fictitious roll numbers to the candidates instead of their real roll numbers before the answer sheets are sent to the examiners for

valuation. From this point onwards all processing is done using the fictitious roll numbers only till the very last stage. At this point, the fictitious roll numbers are translated back into real roll numbers and the results prepared. This is a good method to ensure secrecy and guard against malpractices.

Accuracy :

The Computer assures accuracy to an extent not possible by other methods. Its in-built electronic circuits eliminate errors in processing. Further, all along the processing, checks are incorporated to ensure maximum accuracy. Many innovations are added to the procedures to eliminate errors. For example roll numbers are generated by the Computer itself. The addition of a check-digit (which is mathematically derived from the positional values of the numbers which form the roll numbers) to the roll numbers helps to detect transcription errors. The input data can be subjected to exhaustive screening to verify the validity of roll numbers, detect duplicate roll numbers, check valid subject combinations, etc. Such kind of thorough checking is possible only by using the high speeds and logical ability of the Computer.

Prevention of Malpractices :

In as much as data are stored on magnetic tapes and these tapes can be processed only by the Computer there can be no room for malpractices. Also important statements like mark lists and certificates are printed on pre-printed forms with proof-printing in the background (as in cheques). The total marks obtained are printed both in figures and words. The Computer printing cannot be imitated easily. In all these ways the possibility of malpractices is eliminated.

Help to administration :

The Computer is used to screen application data for errors and discrepancies, assign roll numbers and prepare the nominal roll which is a statement by the school or centre as the case may be—giving the complete information in the application like the candidate's name, roll number, date of birth and subjects offered for examination. It prepares a statement giving the total number of candidates for each centre for each subject and for each medium. This is very useful for organising the distribution of the correct number of question papers to the examination centres.

All these relieve the administration from the dull monotonous chores that have been casting heavy strain on it and enable it to concentrate on more important areas like ensuring proper valuation of answer sheets, etc. Additionally, a variety of statistical reports are obtained by analysing the examination data. These reports are got along with the results, provide valuable information to the examination board and help to progressively improve the standards of examination work. Traditional methods cannot provide such analytical reports in so short a time. It is for these reasons a number of S.S.L.C. examination Boards and Universities have resorted to computerised examination processing. The S.S.L.C. Examination Board in Tamil Nadu has only made a beginning with the October 1972 examination for which 30,000 students appeared. About 2,50,000 candidates are expected to appear for the examination in March 1973. In the years to come it is proposed to extend the use of the Computer in this vital application area to derive the maximum advantage to the administration and enable it in turn to provide improved quality of service to the students.

TAMIL NADU GOVERNMENT

S. S. L. C. PUBLIC EXAMINATION, OCTOBER 1972

NOMINAL ROLL - ACADEMIC COURSE

EDUCATIONAL DISTRICT No. AND NAME

CENTRE No. AND NAME

SCHOOL No. AND NAME

TYPE OF CANDIDATES

THUCKALAY		0001 GGVY H.S., THUCKALAY				9999		3		REGULAR PRIVATE				
ROLL NUMBER	BOOK NUMBER	NAME OF CANDIDATE	NATIONALITY	SEX	DATE OF BIRTH	GROUP A LANGUAGES		GROUP B COURT SUBJECTS			GROUP C ELECTIVES SECTION I (11) (12) (13) (14)	TOTAL CANDIDATES IN		
						PART A (7) (8) (9)	PART B (10) (11) (12)	MATHE- MATICS (5) (6)	SCIENCE (10) (11) (12)	HISTORY AND GEOGRA- PHY (11) (12) (13)		SCHOOL (13)	CENTRE (14)	DISTRICT (15)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
00276	090561U	SALEEN.M	095	I	B	01.12.53	M	E	M	M	M	11 M	PAGE NO. 1	
00277	044081U	REGHU RAM.A	100	I	B	06.05.53	M	E	M	M	M	11 M		
00278	090560U	RGY JOSE POOVATHIL	103	I	B	31.03.56	M	E	M	M	M	11 M		
00279	044091U	VENUGOPALAN.S	099	I	B	04.05.53	M	E	M	M	M	11 M		
00280	002188Q	RAHACHANDRADHAS.P	067	I	B	05.03.56	M	E	M	M	M	11 M		
00281	95868J	YAKOVE.V	019	SC	B	20.04.41	M	E	M	M	M	12 M		
00282	003506Q	N.SREEKUMARAN NAIR	046	I	B	04.04.51	M	E	M	M	M	12 M		
00283	044231U	KARTHIAYINI AMMA.D.	234	I	G	25.05.56	M	E	M	M	M	12 M		
00284	083717U	S.SULOCHANA	256	I	G	20.05.55	M	E	M	M	M	12 M		
00285	083836W	N.PADHAJA AMMA	253	I	G	22.05.55	M	E	M	M	M	12 M		
00286	083711W	C.C.SARANMA	255	BC	G	10.08.54	M	E	M	M	M	12 M		
00287	040314Y	NIRMALAKUMARI.S	288	I	G	28.05.53	M	E	M	M	M	12 M		
00288	083603W	K.BHASKARA PILLAI	138	I	B	17.05.51	M	E	M	M	M	12 M		
00289	083753W	P.NOMANAKUMAR	140	I	B	21.05.53	M	E	M	M	M	12 M		
00290	083754W	D. SUBANANDA DAS MANY	155	SC	B	29.01.51	M	E	M	M	M	12 M		
00291	083755W	V.KRISHNANKUTTI	121	I	B	29.04.51	M	E	M	M	M	12 M		
00292	083610W	K.SUDHARSANAN	120	I	B	08.03.55	M	E	M	M	M	12 M		

The Madras Government Museum is the largest and oldest of the State Museums in India. Since the time of its inception in 1851, it had steadily developed and expanded under the able guidance and supervision of a succession of devoted directors. Beginning as a Museum of Practical Geology, its scope was soon extended to cover other fields such as Archaeology, Ethnology, Prehistory and Natural History. Its first officer-in-charge was Surgeon Edward Green Balfour who launched an intensive collection campaign in order to build up the collections in the various sections of the Museum.

With the merger of the Pudukkottai State into the Madras State, the Pudukkottai Museum also became administratively annexed to the Madras Government Museum, and this may well prove to be a starting point for the establishment of a network of regional museums all over the State.

In 1951, the Museum celebrated its centenary, having completed hundred years of fruitful service to the public as a pioneer educational institution in the State. The Centenary celebrations were inaugurated by the Prime Minister, Pandit Nehru, on November 27, 1951. The National Art Gallery was also organized and thrown open to the public on the occasion.

The Madras Museum is a large multi-purpose museum covering a wide range of subjects and is organized into the following sections: Art and Archaeology, Anthropology, Numismatics, Zoology, Botany and Geology. In addition to these there is a well-equipped Chemical Laboratory for the conservation of Museum objects and a Children's Section and an Educational Service Section. Each of these sections is in-charge of qualified Curator who is a specialist in his own field. These sections contain extensive collection illustrating mostly the past history, culture and natural history of South India. Some of these exhibits are displayed in the public galleries, but a large part of the collections is kept in reserve for study and reference purposes in accordance with modern museum practice.

THE MADRAS GOVERNMENT MUSEUM AN INTRODUCTION TO THE TAMIL ARASU SUPPLEMENT

BY
S. T. SATYAMURTI,
*Director of Museums,
Tamil Nadu.*

Research and publications.

Research has always been a dominant feature of the activities of this Museum. The results of the researches carried on in the various sections have been published from time to time, notably in the Bulletins of the Madras Government Museum, which have raised the prestige of the institution considerably in the eyes of foreign scholars and have brought in several foreign periodicals by way of exchange. The Museum has to its credit a commendable series of Bulletins both on Natural History and Archaeology. Most of these publications are valuable monographs and serve as standard reference works on the respective subjects. Apart from these

scholarly monographs, several popular Guide books and Handbooks have also been brought out recently. The Museum also issues a Half-yearly Newsletter outlining its latest additions and programmes of educational activities.

Reorganization and Development of the Museum.

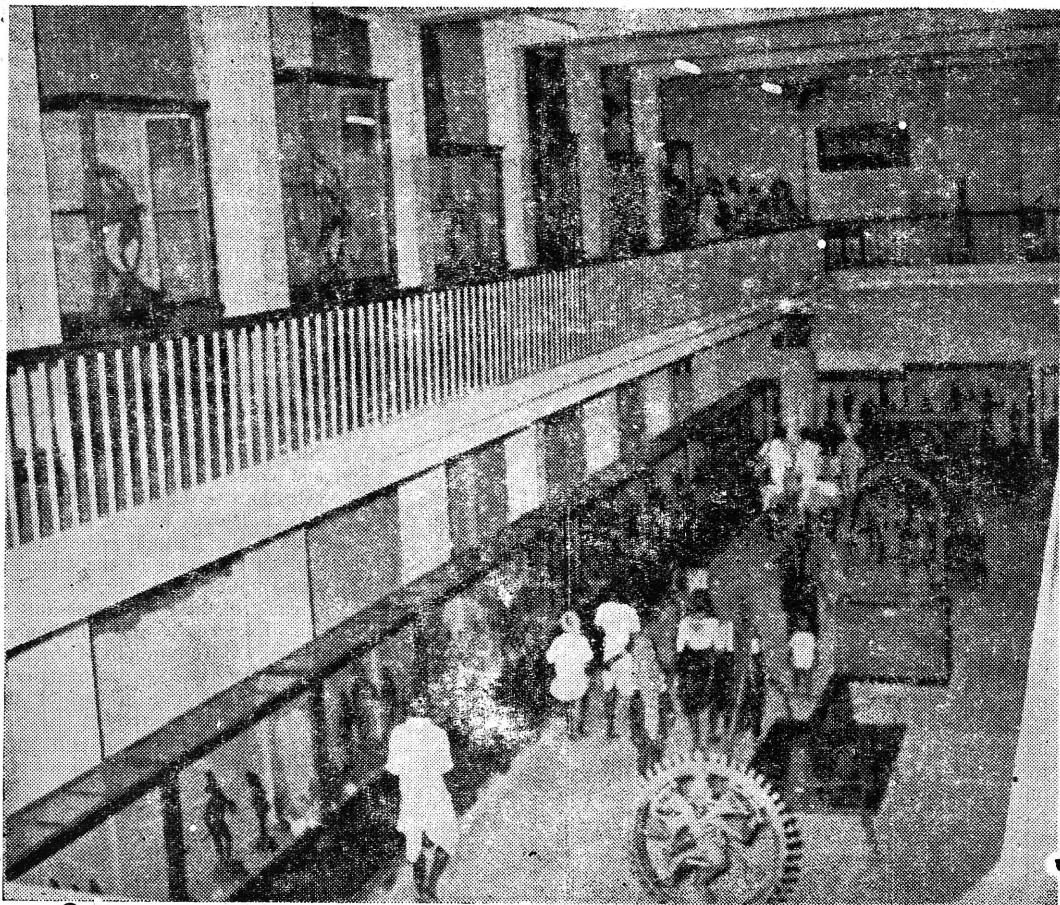
In recent years, with the increased tempo of the museum movement in India, vast schemes of modernization and expansion of the Madras Museum were taken up for execution, thanks to the generous financial assistance received from the Government of India during the past four years. Several galleries have been modernized by the installation of up-to-date built-in show cases and dioramas with concealed internal fluorescent lighting, and construction of three major extensions to the Museum buildings was completed, namely, the Bronze Gallery, the Natural History wing and an extension to the Chemical Conservation Laboratory. The opening of these new extensions by His Excellency Shri Bishnuram Medhi, Governor of Madras, in September 1963, is a memorable landmark in the history of this Museum. More recently, a new gallery of Buddhist antiquities and a Philatelic gallery containing a collection of more than 43,000 stamps from all countries of the world were organized and thrown open to the public.

General information on Facilities, etc.

The Museum and the National Art Gallery are open from 7 a.m. to 5 p.m. on every day of the week except Friday and any other day appointed by authority. Admission to all parts of the Museum and the Art Gallery is free.

Free guide service is available at the entrance to the Museum, the Bronze Gallery and the Art Gallery at certain specified hours (10 a.m., 12 noon, 2 p.m. and 4 p.m.) for those who are interested in availing themselves of such facility. Parties of students are specially invited to take advantage of this facility.

Scholars, research workers and parties of visitors are permitted to take photographs and sketches of objects inside the Museum on taking



Madras Museum caters to scholars and lay public in equal measure.

previous permission of the Director of Museums in the prescribed form under certain conditions. The form with the conditions is available at the Museum Office.

The publications, photographs and picture post cards of the Museum are available for sale at the sales counter at the entrance to the Museum.

The Museum is equipped with a microfilming unit and prepares and supplies microfilm copies of manuscripts, documents and publi-

cations to scholars, research workers and institutions at rates approved by the Government.

The Museum is also equipped with an auditorium, called the Museum Theatre, with a seating capacity of about 530 persons and a spacious stage suitable for concerts and dramatic performances. The Theatre is primarily intended for educational lectures and for cultural programmes organised under the auspices of the Government. When not thus required,

it may be used for educational purposes, including amateur theatrical performances at rates and on conditions approved by the Government.

The Centenary Exhibition Hall in the Museum is used frequently for temporary exhibitions and lectures and is let out to cultural institutions, art societies, etc., for their meetings, annual functions and for exhibitions on payment of a nominal fee subject to the rules and regulations approved by the Government.

The history of India, unlike the histories of several western countries has got to be pieced together from the remains of her material culture. It is interesting to observe that such remains of material culture of the past, abound in India. The materials for this study are chiefly those displayed in the archaeological section of the Government Museum, Madras.

The antiquities which reveal the story of the life of the ancient people are broadly classified into (a) inscriptions (b) sculptures, (c) architecture (d) paintings and (e) coins. Of these, coins are dealt with in the chapter on Numismatics. Amongst these groups of antiquities the most important, from the point of view of chronology and other aspects of social life, is that of inscriptions.

The Madras Museum can claim, with justifiable pride, to be the only Museum in the whole of India to possess a unique collection of inscriptions on stone and copper plates. Other stone inscriptions are those that have come down from Amara-vathi, Bhattiprolu and other places and the metal inscriptions are in the form

ARCHAEOLOGY

SECTION

DISPLAYS

REMAINS OF

MATERIAL

CULTURE OF

INDIA

V

By

P. R. SRINIVASAN, M.A.

of grants etc., written on copper-plates. These belong to various periods and localities. The inscriptions engraved on the sculptures from Amaravathi and the Bhattiprolu stones inscriptions are displayed in the Buddhist Sculpture gallery.

The stone inscriptions of later periods belonging to the Cholas, the Pandyas, the Kalingas, etc., are displayed in the archaeological shed behind the Chemical laboratory. A select group of these is displayed in the epigraphical bays in the right wing of the mezzanine floor of the New Extension. This gallery of epigraphs also contains plaster² of Paris casts of a few representative specimens of writings on copper-plates. The originals of copper charters numbering over 400, are however, kept in safe custody.

Specimens representing culture, etc., are displayed in the various galleries of the archaeological section. They have to be seen in the following order.

To the right side of the turnstile is the flight of steps leading upstairs.



At the head of the stairs is the passage where plaster casts of coins are shown. The hall adjacent to this is devoted to the antiquities from Harappa and Mohenjodaro (see chapter on Anthropology for details regarding the culture of Harappa). At the end of the passage on the wall opposite the wall show cases containing records of the British East India Company is a show case where a representative collection of terra-cotta figurines belong to period such as the pre-Mauryan, Mauryan, Sunga, Kushan and Gupta. Of these the specimens of terra-cottas belonging to pre-Mauryan times are of interest because, as has been mentioned above, very few antiquities belonging to periods earlier than the Mauryan

period have been met with and the figuriness, though fragmentary in nature, show clearly the high watermark of development of the artistic activities of the people of those times. Noteworthy features of these figurines are the head-dress and the jewellery. Their modelling is also no doubt excellent. During the Gupta period the figurines came to be produced from moulds.

Beyond this passage, there are five bays on the left wing of the magazzanine floor. Here in each bay are displayed specimens of sculpture and architectural pieces belonging to important periods of the early history of North India.

Though the Museum is primarily a show room for antiquities belonging to South India in particular history of Indian Culture is one and indivisible and as the early periods of South Indian history are not represented by any tangible antiquities a few antiquities or a casts of very important antiquities of early periods of North Indian history are shown here so as to give the visitor a proper perspective of Indian culture. A study of these, coupled with the study of the prehistoric cultures of Mohenjodaro and Harappa will help a visitor to the Museum a more or less complete and panoramic vista of the cultural and social activities of the people of ancient India. In each bay, the actual specimens are supplemented by photographic enlargements of a few other very important landmarks of the respective periods.

The very first bay here is devoted to the Maurya and Sunga periods. The huge figure representing a chauri-bearer is a good specimens of Mauryan sculpture in the round.

The next bay is devoted to the specimens of sculpture belonging to the period from 0 to 300 A.D. They are of the indigenous school as was practised at Mathura. Here the figures of salabhanjikas and the heads of the Buddha are noteworthy.

In contrast to the above technique employed by the above school, is that of the school of Gandhara specimens of which are displayed next bay. Though the themes are entirely Buddhist, the manner of depiction has been western. This school was manned by artists and sculptors steeped in the traditions of the art of Greco-Roman schools.

In the next bay are shown specimens of sculptures of North India belonging to the Gupta period. It lasted from the early 4th century A.D. to about 600 A.D. This period is acclaimed as the Golden age owing to the remarkable cultural efflorescence of the times.

In the opposite wing of the mezzanine floor, the first bay is devoted to sculptures of the Pala and Sena schools. Among them the dancing Ganesa and the Vishnu are noteworthy. The next four bays are devoted to showing the evolution of the scripts of South India illustrated by a chart, a few original inscriptions on stone, plaster casts of a few copper-plate inscriptions and a cast



of the Asokan inscription from Jangada. The scripts, the evolution of which are traced here are Nagari, Grantha-Tamil, Canarese, Telugu and Brahmi.

Descending through the staircase at the end of this wing, the visitor will find on the ground floor in the passage the turnstile a series of photographic enlargements of temples of South India arranged in chronological order so as to illustrate the evolution of the architecture of South Indian temples.

The visitor will now enter the main hall of the New Extension where monumental sculptures of South India are shown on either side arranged in a chronological order. On the left side are shown sculptures belonging to the various periods of the history of Tamil Nadu. On the right side are sculptures belonging to various periods of the history of the Andhra-Karnataka region.

In the first bay on left side are displayed sculptures belonging to the Pallava period, i.e., from 600 A.D. to 850 A.D. Here are a magnificent Vishnu, a Ganesa with four hands, a bas-relief composition and a beautiful horned Dvarapalaka. These are characterised by powerfully moulded bodies, naturalistic features and sparseness of ornamentation. The Vishnu figure exemplifies all these characteristics in a remarkable manner.

The Pallavas were succeeded by the Cholas about the middle of the 9th century A. D. and the latter were supremely powerful for over four centuries. The Chola period is therefore divided into two parts, early and later. During the early Chola period arts and literature reached the height of their development while in the later Chola period, the traditions of the earlier period were continued with but slight changes. Specimens of sculpture of the early Chola period are shown in the next bay. Among them the most noteworthy are the superb shanmukha (unfortunately badly mutilated), the Ardhanarisvara from Tiruchchinnampundi, the Dakshinamurti from Cholamaligai and the group of Tripurantaka and Tripurasundari from Kodumbalur which is dated to about the middle of the 10th century A. D. and Virabhadra from Tiruchchengattangudi. The sculptures of this period are noted for their idealisation of human form and refinement of the decorative details. Conse-



quently, the sculptures of this period are finer and the portrait sculptures are depicted in a variety of beautiful postures.

The sculptures of the later Chola period which ended about 1300 A. D. are shown in the next bay. As has been said above, these are distinguished by slight stylisation and elaboration of decorative details. The sculpture showing Ranganatha with Sridevi and Bhudevi is a typical example of this period. The refinement and classicism of the earlier period may be found to be continued in the sculpture of Bhikohatana.

After the Cholas, the whole of South India came under the rule of the emperors of Vijayanagar (Hampi) They were reputed for their devotion

and so were engaged in building new temples and in adding lofty gopuras to such sacred temples as the Nataraja temple of Chidambaram and the Arunachalesvara temple of Tiruvannamalai. The new temples built by them are to be found at Hampi itself. Though these kings lavished their wealth on building such magnificent edifices as mandapas and gopuras, the sculptors and artists of their period worked in their own way probably caring more for pomposity than for artistic excellence, with the result the sculptures of this period attained momental proportions and possessed vigour and excessive embellishments only. The sculptures shown in the Vijayanagar bay bear out these remarks clearly. It is evident in the Bhikshatana and the seated Vishnu figures-

An interesting piece of sculpture in this bay is the bas-relief showing the emblem of the Vijayanagar dynasty. The Vijayanagar period ended about 1600 A. D.

The next bay is devoted to sculptures of the modern period i.e. the period after 1600 A. D. These sculptures are perfect in so far as their iconography is concerned. But in other respects they are very poor specimens of the art.

There are a few interesting specimens of sculpture belonging to the early Chalukyan period (6th to 9th century A. D.) The huge two-handed Ganesha shown here is from Bezwada as also the two huge dvapalakas and two elephants shown on either side of the flight of steps at the other end of the New Extension. Though these are monumental in size, their exquisite workmanship is apparent in every one of their limbs. This is clearly seen not only in the dvapalakas but also in the Ganesha, all of which are intended to be seen from a distance. An interesting sculpture of eight handed Sarasvati in dancing posture finds a place here.

In the next bay sculptures belonging to the period from about 850 A. D. to 1100 A. D. when the Nolambas were powerful in and around Bellary and Anantapur districts are shown. Among these the Vinadhara Dakshinamurti, the Umasahitamurtis and the Natesa are splendid ones.

In next bay are exhibited beautiful specimens of sculpture belonging to the Hoysala-Kakatiya period. The intricately but beautifully worked gateway (about 11th century A. D.), the badly mutilated figure of a goddess within the gateway, the Kubera of the early Hoysala period and the Saptamatrka sculpture are noteworthy here.

In the next bay specimens of sculpture of the Vijayanagar period from the Hampi and other places in the Andhra-Karnataka region are displayed. Here the elephant, the sage and the reliefs occurring on the parts of temple basements are interesting for their realistic character.

Beyond this is the Hindu Sculpture Gallery where Hindu sculptures

of various periods and localities are shown. Besides, a series of architectural pieces are also shown here and these are arranged so as to illustrate the evolution of motifs such as corbel, kudu and base of a temple through the ages. The sculptures are displayed on either portion of the platform in which the architectural parts are kept. The portion immediately adjoining the Memorial Sculpture Gallery contains specimens of Hindu sculpture of the Tamilian schools while the corresponding portion on the opposite side contains sculptures of the Andhra-Karnataka schools.

Buddhist Sculpture Gallery.—Adjoining the Hindu Sculpture Gallery, is the Buddhist Sculpture Gallery. It houses some of the earliest specimens of the art of sculpture, architecture and writing. These include a part of the world famous sculptures from Amaravati, a few sculptures from Jaggayyapeta some of which are most probably the earliest existing sculptures of South India dating from about 200 B. C., and a few stray pieces from places like Ghantasala. Almost the whole collection of early sculptures comes from Andhradesa. Nevertheless, a few huge sculptures in stone belonging to late medieval periods of Tamilnad are also displayed here. Most remarkable amongst the exhibits of this gallery are the three-stone relic caskets from Bhattiprolu.

The next group of antiquities exhibited in this gallery are from Jaggayyapeta. It consists mostly of sculptures of Buddhism. They are next in important only to the Bhattiprolu relics. The two world famous sculptures among them are the one which represents Chakravarti Mandhata and the other which represents an oblong shrine (*Punyasaala*) with a wagon shaped roof. The remaining items in this gallery are the sculptures from Amaravati. They belonged to a Buddhist stupa of the place.

In view of the fact that monument was neither a work of a single period, nor of a single hand, the sculptures show naturally variations in their workmanship. On stylistic grounds, the sculptures are divided into four groups. The first group of sculptures belong to the period up to about 100 B. C. They are only few in number. Amongst them may be mentioned the Man and Boy, the Sri on lotus on a coping stone and

the bas-relief sculptures carved on a short pillar. The characteristics of these early sculptures are akin to those of the sculptures from Bharhut. This is evident especially in the head dresses, ornaments, clothing and in the modelling of the figures, which is archaic.

The second group of sculptures belong to the period from 100 B. C. to 100 A. D. They include large slabs having representations of stupa-worship, Buddha-worship and Bodhi tree worship. Several of them are also inscribed. The characters of these inscriptions give us an idea about the date of the sculptures.

The sculptures belonging to the third group are by far the largest in number. Most of them are parts of the huge railing put up during the middle of the 2nd century A. D. It is said that Nagarjuna Acharya, the great Madhyarnika teacher, was responsible for this. It is in these sculptures that one can see the perfection of the art of sculpture of ancient South India.

The fourth group of sculptures belong to the first half of the 3rd century A. D. They include casing slabs with miniature stupas carved on them, friezes showing Buddhas and stupas, a pair of standing Buddhas and friezes with sculptures in miniature size showing scenes from the life of the Buddha and jataka stories.

In a corner is seen a huge standing Buddha made of granite. It is larger than life-size and has very strong features. Its modelling is very powerful. It may be assigned to the 7th century A. D. It was found in the Sri Kamakshi Amman temple of Kanchipuram. Its provenance and date suggest that during those early periods Buddhism was very strong at Kanchipuram.

There are also a couple of big stone Buddhas in this gallery. One of them comes from Kuram and the other from a village in the Tanjore district. They are late figures and so comparatively of little artistic merit. The plaster cast of the famous Buddha from Mathura has recently been added to this gallery.

The cream of the museum's collections, viz., The South Indian bronzes are exhibited in the newly opened Bronze Gallery. The collection of bronzes of South India of

this Museum is justly famous all over the world. About 400 specimens of them are on show. Another 600 specimens of the art are kept in reserve collection. Rarely do we find such a large collection of metal figures under a single roof. They are important not only quantitatively but also qualitatively. They are divided into categories on the sectarian basis, namely Saivite and Vaishnavite. Each group of bronzes are displayed in separate rows and are arranged according to iconography. Amongst the bronzes of the Saivite group the most famous are the Natarajas. Similarly the most interesting amongst the Vaishnavite bronzes are the two groups of bronzes representing Rama, Sita, Lakshmana and Hanuman and Vishnu with Sridevi and Bhudevi. Recently an excellent Ardhhanarisvara bronze was received as a treasure trove find from Tiruvenkadu village, Shiyali taluk, Tanjore district (Fig. 23). This is an elegant bronze and its interest is all the more great, for it bears inscriptional reference in the temple. It is stated that the image was set up by Tippayan Uttama Chola, during the period of Rajadhiraja I (1047 A.D.). Another graceful figure of Chandeshvara (Fig. 24) was also unearthed at the same village and also exhibited in the same gallery.

Besides these Hindu bronzes, a very important collection of Buddhist and Jain bronzes is also on show in this gallery. The Buddhist bronzes come from two places, namely Amaravathi and Nagapattinam. The bronzes from Amaravathi are only four in number but their date is 5th-6th Century A.D. Hence until now these bronzes from Amaravathi are the earliest examples of the art of India. Coming as they do from a famous Buddhist site, they also represent Buddha. Of these the large standing Buddha is noteworthy.

The last but not the least important among the items of bronzes to be noticed here are the Jain bronzes. Four of them are on show. They represent Tirthankaras like Adinatha and Mahavira. They may be assigned to the 11th-12th Centuries A.D. They come from the Bellary District. Unlike the Venu-gopala bronzes from Chimakurti, these Jain Tirthankaras are classical in style.

Apart from those on show, as has been said above, a large collection of bronzes is kept in reserve. They include images of all the three religions. Among Hindu bronzes in the reserve collection mention may be made of the Ayudhapurushas representing Kaumodaki and Sudharsana, the gada and chakra respectively of Vishnu, and the group of Triupurantaka and Triupurasundari acquired recently. The Jain images of the reserve collection include an early Chola Tirthankara figure from Sivaganga in the Pandyan territory and a group of Mahavira, Ambika Yaskhi and another Mahavira all of later Chola date acquired from Sigani-kuppam village in the South Arcot District. The big Mahavira of this group is the largest one of its kind acquired so far. The bronze Ambika of this group is similar in all respects to a Parvati of later Chola period but with this difference, namely in the crown of this figure there is a seated Jina figure and the Yaskhi is attended by a maid holding a garland of flowers of exquisite finish and a male baby who resembles in every respect the Skanda of Somaskanda groups. The modelling of the ornaments and the bhanga of the Ambika are charmingly exquisite.

In the gallery of minor arts in the nearby front building a great majority of exhibits are articles of metalware. While the potter's products were popular with the masses, their imitations in metal began to be made by sthapatis for use in temples as well as in the houses of the well-to-do. No doubt the earthenware pots and pans had their own artistic embellishments. But the decorative designs with which the articles of metalware came to be beautified surpassed both in beauty and in variety those met with in pottery. Even the very shapes of the different items of an independent category of articles are artistic.

Thus among lamps there are a number of groups such as hand lamps, standing lamps, hanging lamps and Dipalakshmis or women lamp-bearers. In each one of these groups distinct and independent types are observed. The Dipalakshmis are specially made by wealthy people for donating to temples. In the temples of Tamil nad one will come across them frequently. Among the standing lamps the most popular are the

hamsa and the kinnari lamps. A special variety of standing lamp called in Tamil *kilai vilakku* (*Dipavriksha* in Sanskrit) with a number of branches from which hang down rows of lamps is an important item usually met with in temples. In large temples like the Madurai temple such lamps of huge dimensions may be found. In the collection of this Museum there are two such specimens, which are called wedding lamps.

The other categories of metalware articles are the trays including the Tanjore trays which have bas-reliefs in copper and silver on their inner side, utensils employed in the workshop of a temple of South India, the articles of daily use like the *chellapetti* combs, collyrium box, chunam box, nut cutters and so on; toys, bellmetal utensils in everyday use in a South Indian home and models of household utensils of the well-to-do people of Malabar.

A collection of Bidriware articles are also on show in this gallery, besides a representative collection of utensils used by Mohammedans of South India. The Bidriware articles are beautiful in their form and the designs on them.

At one end of the gallery are displayed a collection of Buddhist bronzes and utensils from Nepal and Tibet. The most interesting among them are the images of Lanka and Tara and the Simla. A noteworthy feature of these articles is that they are made by the hollow-cast method, and they are gilt. The sculptures of Nepal and Tibet are characterised by atibhargas, slimmness and excessive embellishments. These features are readily observed in the specimens in the Museum collection.

A small collection of specimens illustrating lacquer work is also on display in this gallery. They include a number of card-board discs with designs and figures done in lacquer, a few fans and a few containers. Besides, these, two sets of ivory playing cards with designs done on them in lacquer are also exhibited here. These arts may be said to have disappeared for want of patronage.

Among other groups of articles in the gallery the two sets of porcelainware and the collection of glazed pottery deserve special

ment. The specimens of glazed pottery have been obtained from Karigiri where this kind of ceramic industry is flourishing to this day.

• In the passage between the metal-ware gallery and the flight of steps are displayed two or three groups of wood carvings of temple cars. They may all belong to the last century. As usual each carving represents a deity of the Hindu pantheon. Besides these groups of carvings, a few stray carvings also find a place here. Among these are the Ravana from Ramanathapuram District and the pillars bearing at their bases beautiful carvings of women. A very old wooden pillar from Mudibidri in South Kanara District is also exhibited. It is a very interesting specimen of a pillar because it shows the vase and foliage capital and has small panels containing bas-relief representing Seshasayain Vishnu, etc. These remind one of pillars occurring in the

caves of the Western Deccan, and it may therefore be said that this Mudibidri pillar is a distant echo of those cave pillars. Another set of four long friezes with several panels of carvings in them are displayed on the walls flanking the flight of steps. These were got from a temple at Quilon. The panels depict a continuous series of scenes from the Ramayana.

The most impressive of the collection of wood works are the two doorways displayed one on the first landing place of each of the two flights of steps. They are replicas of Mysore palace doorways and were purchased from the exhibition held in Delhi during the 1911 coronation. A large number of wood carvings are kept in reserve collection including an elegant Subramanya (Fig. 34).

Apart from these articles on show, a good number of interesting

items under each category are kept in reserve. Among them the richest are the wood carvings which include a rare collection of twenty large carvings dating from the end of the 18th century A.D. got from the sixth temple at Kalaiyarkovil in the Ramanathapuram District.

Thus the archaeological collections of this Museum are rich both in quantity and in quality and the nation in general and the Madras State in particular can take pride in being heir to such a remarkable legacy of art treasures and valuable antiquities. Owing to the richness and the variety of these unique collections, the world of Indologists make it a point to get their doubts regarding any aspect of South Indian art and culture cleared by referring the matter to the authorities of the Museum and it is the avowed policy of the latter to help the scholars as far as possible.

FLAG DAY 1972



Flag Day 1972 in Tamil Nadu. The military official pinning the flag on the upper wearing of Thiru K. K. Shah, Governor of Tamil Nadu (Left) and Dr. M. Karunanidhi, Chief Minister (Right) Thiru Oza, Secretary, Home dept. is also in the picture.

GEOLOGY GALLERY OF MADRAS MUSEUM

The Geology galleries of Madras Museum consist of (a) General Geology, (b) Rocks, (c) Minerals (d) Economics Geology and (e) Fossils.

As soon as a visitor enters the Geology galleries, he has the unique privilege of facing the celestial bodies. These bodies instead of remaining celestial, have come down to the earth as a result of the latter's force of gravity, only to be collected as heaven stones or meteorites. A plaster cast model or replica (the original having been destroyed in analysis by the Geological Survey of India) of the meteorite that fell at Valudavur during a war year (1942) is an interesting object.

A couple of oil-paintings at the farthest end portray a comet as seen from the earth at dawn and a lunar landscape (with earth as seen from the moon). Through these means the lay visitor given in vivid colours some ideas of other worlds and (natural) satellites.

A little to the left, is the General Geology series. It includes also all illustrations pertaining to the structure of the earth, its architectural details, etc. Thus we have a photograph of the earth from 100 miles up and a plaster model to show the internal structure of the earth.

A small model, prepared to scale, of the contour levels of the Madras City and its immediate neighbourhood reveals the location, at higher levels, of the different lakes that supply drinking water to the City. The architects of the earth's surface, that are referred to in these galleries are water plants, animals, wind, weather, and underground disturbances. The influence of these architects is mainly measured by the changes that take place on the earth, and the exhibits accordingly illustrate only these changes as far as practicable. For instance, they consist of valley developments, faults and folds, earth-

quakes and volcanoes (illustrated by photographs and charts). Some of the interesting exhibits besides the photographs and charts are a water-cut tunnel, diatomaceous earth, exfoliating rock, Vesuvian lava, etc.

The rocks and minerals are arranged in two different ways, one with the object of showing their places in systematic studies and classification and the other with the object of bringing out their importance in practical and industrial applications.

The minerals are arranged according to their chemical composition which is the basis for their classification.

The practical and industrial applications of the rocks and minerals constitute Economic Geology, to which a large space

By

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in the Geology galleries has been provided. This gallery is very popular with, and much appreciated by, many a visitor, since the other exhibits call for some academic interest to understand them better.

A good many building stones are on display. Among them the stones used in the construction of the Maharaja's Palace at Mysore, and the marble used in the sculpture of the Fort Church, Madras, deserve special mention.

The Precious Stones.

The group of precious and semi-precious stones, cut and uncut, is one of the most attractive groups in the Geology galleries. Their special interest lies not only in their rarity but also in the fact that they display a remarkable combination of such rare qualities as

beautiful form and gorgeous colour, dependable harness and durable strength, attractive lustre and high refractive index.

The exhibits relating to the manufacture of glass-ware, are both attractive and interesting. They comprise of the materials and photographs that are connected with the making of (1) block glasses, (2) Glass beads, (3) Belan bangles, (4) Tarapore bangles and (5) bottles, Chimneys and scientific apparatuses. There are sixteen block glasses, each of a different colour. The making of glass beads is illustrated stage by stage, commencing with bead rods and brass wires, and ending up with necklaces. Of them all the special block glass beads which are less than half the size of mustard, and which are provided with holes for stringing, evoke eloquent admiration from Indians and foreign visitors alike. They go to show to what perfection and fineness human hands can work, and have remained even in these days, a challenge to the machines.

The making of Belan bangles from spirally-coiled glass rods, and of Tarapore bangles from twisted glass rods, is explained in detail. Actual samples and photographs depict the making of bottles. Chimneys, and scientific apparatuses, as well as the stages in the manufacture of lenses from pebbles of rock-crystal.

Raw-materials for making saltpetre and sulphuric acid, abrasives and pigments, building cement and refractories, form small interesting units in the galleries. Among the refractories, is the vermiculite, a bomb-proof and heat-proof mineral substance that has been reported to be available in plenty in Tamil Nadu in recent years. Fire-clay and the refractory products derived from it are given adequate representation, since they are indispensable in all industries wherein heat-treatment, be it high or low, electrical or mechanical, is involved. To these may be added another small group

of minerals that can be used directly or indirectly, as fertilizers. Included in this group but exhibited separately are two large crystals of rock-salt from the Salt Ranges. They are interesting for their size and crystalline form. Each of them is a five inch cube, and while one is white, the other is flesh-coloured.

GOLD EXTRACTION.

The exhibits illustrating the extraction of gold also attract the masses. They consist of ore samples and materials used in the extraction of gold and a flow-sheet of the whole process. The principal element attracting the masses, is the presence of visible gold on some of the ores.

Minerals with radio active elements are of no small interest, because of the ever-so-many uses to which the radio-activity of the

elements concerned, is put. The exhibits under this head, include a chart of disintegration of Uranium (prepared in the Museum) Sarmarskite from Andhra State, Monazite from Kerala State, Thorianite from Ceylon, and Torbernite, Autunite, Euxenite and Carnotites from the United States of America.

The lignite industry of South Arcot district is comprehensively represented. The exhibits consist not only of lignite samples and briquets, but also of a few other materials relating to some of the subsidiary industries that could be started at the site (e.g.) spotteries refractories, etc.,

The Fluorescence Box in the Geology galleries, illustrates the phenomenon of fluorescence by minerals when they are exposed to

ultra-violet rays. The ultra-violet light which is invisible is obtained from a special bulb fitted into the Box. By the side of this bulb, is an ordinary incandescent bulb. The two bulbs can be connected to the mains by a common switch but not simultaneously, i.e., when one light is on the other light is switched off. A set of minerals, all of about the same colour, are so placed in the Box as to be seen only through a projecting window which shuts out the bulbs from view. The minerals used are Quartz., Argonite Calcite and Fluorspar. They all appear to be white in colour under the ordinary incandescent light which they reflect. When the ultra-violet light is switched on (and the ordinary incandescent light is automatically switched Off) the mineral as absorb energy from the ultra-violet rays and re-emit the same in the form of visible colour from mineral to mineral depending upon the optical characteristics of the mineral concerned. This phenomenon known as fluorescence, is of extensive application in medical treatment and Criminology.

FOSSIL SECTION.

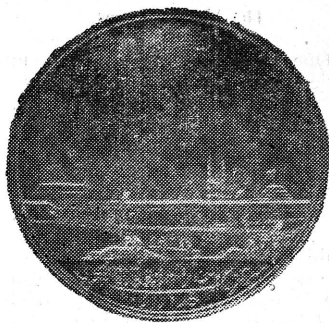
The fossil series open with an introduction to the different geological periods, and then lead on the remains of past life (fossils) that existed in those periods. They include samples of beds of a few important geological strata (of which the flexible sandstone is of popular interest). The fossils are arranged in the order of their stratigraphical sequence and mostly belong to the animal kingdom, especially the invertebrates. Some plant fossils from the Gondwanas are also there. Among the animal fossils the model of an extinct reptile, Brontosaurus is rather a thought-provoking exhibit.

All duplicates, triplicates, etc., and those materials which for some reason or other, are not exhibited in the public galleries, are separately stored as reserve collections. They are accessible to scholars and research-workers and to those who are directly interested in the subject. A special mention may be made here of a vast collection of Cretaceous fossils hailing from Thiruchirappalli District, ores of radio-active elements, and double-refraction calcite.





"The Madras Museum has a rich collection of coins and it has in its collection over three thousand punch marked coins."



THE NUMISMATIC SECTION OF MADRAS MUSEUM

The coin cabinet of the Madras Government Museum has a rich collection of coins representing many important dynasties of India and also foreign coins such as Roman Byzantine, Venetian Chinese, Indo-Dutch, Indo-Danish, Caliphate, etc. The North India coins collection was enriched by generous donations received from the Royal Asiatic Society of Bengal and its Bombay branch. In the year 1892, the Museum received the collection of South Indian coins belonging to T. M. Scout of Madura. Others who were responsible in augmenting the collection were Dr. Hultzsch and Dr. Henderson.

Coins are one of the important sources for the study of History and Archaeology. The Puranas or punch marked coins are the earliest coins in India. The Madras Government Museum has in its collection over three thousand punch marked coins. The main source for building up the collection are the treasure trove coins. Treasure trove hoards of these silver punch marked coins came from all parts of South India. Notice of discovery of punch marked coins in the South dates back to 1803. It is only in the year 1894 that the Madras Museum received its first punch marked coins from Bhimlipatan in Vizagapatnam. The most interesting find, however, was a hoard of 1,138 silver coins found in Bodinaikkanur in Madurai District.

The Indo-Batrigan Greek coin series in our collection amount to about a hundred. A major portion of the series in our collection were found in excavation at Taxila and presented to us in 1940 by the Director-General of Archaeology.

The Kushan coins in the collection number about one hundred and seventy. The collection has a few gold dinars of Vasudeva and Hurishka and copper coins of Kanishka, Kadphises I and Huvishka. The Kushana copper coins of our cabinet were received from the Government of Uttar Pradesh.

The Gupta coins in our collection are fifteen and they include the coins of Samudra Gupta, Chandragupta II and Kumaragupta. We have the coins issued by Rajput dynasties to be flourished between 8 and 12th centuries A. D. and these number is about fifty. The coinages of only the Rathor of Kanauj chautians of Ajaner and those of Narwar are represented in it. In our collections we have over 1,000 coins of the Khiljis, the Tughluqs, the Saygids and sodis and the surd representing the coinage of the period from 12th to 16th century A. D. We have with us the coins of Shershah, Sikandar Lodi, Firoz Jughlaq, etc.

The Mughal coins in our cabinet are the best in the whole series of medieval North Indian series. The three thousand Mughal coins in the Museum represent the coins issued by almost all the Mughal rulers from Humayun to Shah Alam II. The gold, silver and copper coins of Emperor Aurangazeb numbering 884 in all, amount to one-third of the entire Mughal coins collection and the number of the coins of other Mughal emperors are as follows: Mohammed Shah 539, Jahangir 129 and Shahjahan 300. The Mughal coin collection was received from various sources in the North on distribution of gratis basis.

V

BY

N. SANKARANARAYANA,

Curator,

Numismatic Section

The Mughal Coins.

One unique feature of our coin collection is that it includes not only the Mughal rupees and motars but also the pagodas and the params issued in the name of some later Mughal emperors, Ahmed Shah, Mohammed Shah, Alangir II and Shah Alam II. We have also in our collection Din-in-illahi mohurs issued by Aulla to propagate his divine faith and also the famous zodiacal mohurs issued by Jahangir, we have only two zodiacal mohurs. We have also a few coins of the pales, vardhanams including Harshavardhans, Indosessanian, Kakaharntas, Wister satraps and tribos like kunindas and yandhayas.

The Madras Government Museum has a remarkable collection of South Indian coins representing almost all the types. The collection includes the coins of Eastern and Western

Chalukyas, the Cholas, the Pandyas the Vijayanagar, the Satavahanas, etc. More than six thousand Andhra lead and potin coins are in the collection of the Museum and a large number of them are of a similar type with an elephant on one side and ujjain symbol on the other, without any legend on them and worn out. We have a fairly good collection of Chola gold coins which number about 300 and they represent the coins of Raja Raja, Kulottunga, Yuddhamalla and Chola narayan. We have also in our collection hundred and sixteen silver coins of the Cholas, which include the coins of Raja Raja, Rajendra and Uttama Chola. The Madras Government Museum coins cabinet has a good collection of the coins of the Pandyas. The Vijayanagar coins in our coin cabinet represent almost all the important Vijayanagar rulers. Among them there are about 300 gold coins representing Harihars Raja I, Bukkau, Hari Hara II,

Deveraya, Krishnadeva Raya, Achyuka Raya, Sadasive Raya, etc. Apart from these gold coins we have a good collection of copper coins of Vijayanagar dynasty.

The two Mysore sultans, Haidar Ali and Tipu Sultan, during their short reign of thirty-eight years, issued a large variety of coins. The Museum has the best collection of these two sultans, part of the copper collection acquired by purchases in 1904-1905 from Udupi in South Canara. The gold coins were found as treasure trove hoard. Haider Ali issued pagodas and panams with figures of Uma-mahesvara on one side following the pattern of the coinage of the conquered. We have also fortyfour copper coins of the Sethupatis. The most significant addition to our collection of South Indian coins was the acquisition of 143 lead coins from Andipatti village, Chengum taluk, North Arcot district. In the centre of the obverse

Collection of Roman Coins Establishment

Beyond doubt our hoary contacts with Europe

of all the coins is a symbol which in shape resembles an aukusa to the right of which are two lines. Small circles are found above the upper and below the lower lines. These symbol are surrounded by thirteen letters in Tamil Brahmi script.

These coins are dated to 2nd or 3rd century A.D. on the basis of the paleography of the script. These coins are of great important in the study of South Indian History.

There was active contact between South India and a few foreign countries. We have literary references to this in our ancient literature. This evidence is corroborated by the discovery of a large number of coins in South India. The collection of Roman coins with us is a remarkable one and one of the best in the whole of India built up entirely through treasure trove hoards in South India, found mainly in and around the

Coimbatore district, clearly indicating the commercial intercourse between Rome and Ancient India.

We have in our collection of Roman coins, the coins of Cludian, Nero, Domitian, Augustus, etc. The coin cabinet of the Government Museum has in its collection coins of other countries such as Venetian, Chinese, Indo-Dutch, Indo-Danish, Indo-French, etc.

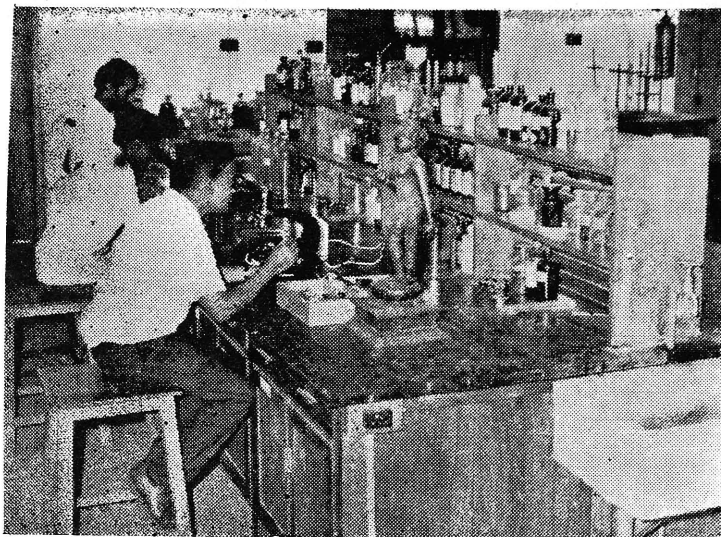
Apart from this rich collection of coins, the Numismatic section has also about 500 medals. Among them, some are commemorative medals and some one decoration medals. Madras Exhibition medals, Calcutta Agricultural show (1864), Inauguration of Indian Railway (1860), Inauguration of Benaras College, First Industrial Exhibition for the Central Provinces, Nagpur (1865), to mention a few commemorative medals. Crimean war (1855), Burma war (1889-92), Victoria cross

for valour, Napoleonic war, to mention a few, are decoration medals.

A few important historical documents are preserved in the section. Mention may be made of a few such historical documents—the charter granted to the United English company (1758 A.D.) Treaty between the company and the Nawab of Arcot (dated 31st July 1801), charter creating Bishopric of Madras (dated 30th June 1835), Treaty between Tipu Sultan and company (dated 11th March 1894) and the letter from Robert Clive to Hard Palk (dated 7th May 1766).

The Madras Government Museum has the unique distinction of having first Philately section in any Museum in India. There is a separate gallery where these stamps are on display. There are about 45,000 stamps in the collection of the Government Museum representing the stamps of many countries.

“The Madras Museum laboratory has got the world’s biggest Electrolytic Plant for the electrolytic restoration of the largest bronzes in the world”.



THE CHEMICAL CONSER- VATION SECTION IN MADRAS MUSEUM

As the collections in the Museum, which was founded in 1851, grew to be rich, varied and valuable, the need for taking care of them properly was increasing by leaps and bounds. This was especially so in the case of the South India bronzes of which this Museum has the best collections. As Madras is on the sea coast, the problem of preserving the precious bronzes in the moist and saline atmosphere of the City has become an arduous task. In 1929, this was referred to the Archaeological Survey of India by the Museum authorities who wanted to employ a chemist. On the advice of the Archaeological Chemist in India, one of his assistants, Thiru Ram Singh Ahuja was appointed for a short period of six months to take up the preservation of Bronzes.

For the care and conservation of the vast collections in the Museum the necessity of having a conservation laboratory was soon felt. It was started in the year 1930 in a separate small building with three rooms. It owes its existence to the forethought and vision of Dr. F.S. Gravely, then Superintendent of the Museum. It is the first and foremost Museum in our country to have its own laboratory and that too installed in a separate building. Professor Erlam Smith of the Presidency College, who had made special

study on conservation in Europe and America was the advisor to this conservation laboratory. As the volume of the work, increased, a permanent laboratory building was put up with six rooms in 1937. An additional two storeyed block was constructed and opened in September 1963 by His Excellency Thiru Bishnuram Medhi, the then Governor of Madras as the work of the laboratory came to be extended in scope.

The laboratory has got the world’s biggest Electrolytic Plant for the electrolytic restoration of the largest bronzes in the world. Work of this kind was formerly confined

BY
S. THANGAVELU

to very small bronzes in America. Hence a new technique was developed and a suitable electrolytic plant planned in this laboratory and installed.

Sir Richard Gregory, F.R.S., Editor of ‘Nature’ visited the laboratory in 1932. He highly commended the work and the research done in the laboratory. Again the

Museums Commission, headed by Thiru S. T. Markham and Thiru H. Hargreaves that visited the Museum in 1935, eulogised the scientific work done in the laboratory.

The laboratory has extended its work to include pre-historic iron and pottery, Amaravathi and other stone sculptures, bones, paintings, various kinds of metals and alloys (Bronze images coins of various metals and alloys, copper plates, etc.), leather objects textiles, wood carvings, etc. There is no material which has not been tackled by this laboratory.

Scientific Equipments.

The laboratory has, besides, regular analytical equipment, an electrolytic restoration plant, a portable X-ray unit, Ultra violet and infra-red lamps, a vacuum impregnation tank, a fumigation chamber, a stereomicroscope, a research microscope, a Thernohygrograph, a muffle furnace, 'Sico' metal hot air over with bimetallic thermoregulator, a single pan analytical balance, a special stand for the examination of paintings, a kilburns-Manesty electrically operated water still, a philips conductivity measuring bridge, a kilburns laboratory stirrer and a carl zeiss spectrophotometer. Thus the laboratory is equipped not only for conservation work but also for research.

Laboratory Space.

The working area of the old building is 102 sq. m. (1,100 sq. ft.) and the new building is 140 sq. m. (1,510 sq. ft.) each, ground floor and the first floor. The electrolytic restoration plant has been installed in the old building. There is a separate room for cleaning and washing purposes. One room in the old building is used as a park room where X-ray and photographic work are being done. In the new building analytical work, scientific examination, repair work and picture restoration are being done. In separate room between the two buildings houses is the Gas plant which supplies gas to all laboratory benches. An overhead tank which is constructed at the roof of the first floor, supplied water to the laboratory.

The Library.

Attached to laboratory is a library where up-to-date technical books, magazines and periodicals are kept for reference. The library is always being augmented with the latest publications on the subject.

Works in the Laboratory.

The objects in the Museum belong to four categories according to their nature (1) Organic materials, (2) Inorganic material, (3) Siliceous material, (4) Paintings. The common agents responsible for deterioration of museum materials are :

- (a) Atmospheric gases and impurities.
- (b) Humidity and temperature.
- (c) Bacteria, moulds and fungi.
- (d) Insects and birds.
- (e) Soluble salts.
- (f) Light.

In order to preserve an object, firstly the nature of the material of which it is made, the extent and nature of decay it has undergone and the processes it can safely be subjected to are to be studied through scientific examination with the aid of chemical knowledge, microscope, ultra violet, infra-red and X-ray equipments. Then the causes of deterioration of the material are to be investigated. It is only after such investigations proper methods of preservation are devised. Experience and manipulative skill are necessary for successful preservation. In the treatment of objects hasty methods should be avoided. Otherwise the antique character of the object will be lost. The choice of a method and the time taken for treatment depends upon the physical and chemical condition of the specimen.

The treatment that should be given differs from material to material and from object to object. For instance, what may be a suitable process for copper may be quite unsuited for iron; the methods use to restore leather will be inadequate for ivory; what is more,

the methods also vary for the same material, say iron. What is safe for a piece of iron with a well preserved core of metal will be unsafe for another iron object which is heavily mineralized.

Other activities.

Popular lectures are delivered and special exhibitions are arranged by the Curator for the benefit of the public and students periodically. The Laboratory is imparting training on conservation for those who join the Museum Technique course and for persons who are deputed from other institutions. This Museum is one of the few institutions in our country where the half yearly inspection of the condition of the exhibits is being done by the Curator and the Curators of the sections concerned with the presence of Director of the Assistant Director and the Educational Officer. Every-year the Curator is called up on to lecture to the students of Archaeology of the Madras University leading to the M.A. Degree.

The Government Museum become a registered member of the International Institute for conservation of historic and artistic work on 9th of February 1961.

Research and publication :

Research work has been a feature of the work in this Laboratory. Original findings made in this Laboratory have been published in "Proceedings of the Indian Academy of Sciences", "Nature", "The Journal of the Madras University", "Technical Studies", "Current Science", "Transaction of the Archaeological Society of South India", "Journal of the Indian Society of Oriental Art" and "Studies in Museology". Popular articles on conservation have been published in "Times of India", "Tamil Arasu", etc.

Conclusion.

Thus the laboratory of this Museum is engaged actively in conserving the rich cultural patrimony of our country.

A TREASURE HOUSE OF ALL ARTS

The art of both secular and religious paintings is well known in Southern India long before the Christian era. Tolkappiam, the earliest Tamil literature, refers to the art of painting them in vogue. Sangam literatures which are assigned to the early centuries of the Christian era throw much light on the nature of art and its influence on the social life of the people. The ceilings of temples were decorated with paintings depicting scenes from mythology. The bed chambers, courtyards and other halls of the kings, and their retinue were beautifully decorated. Since perishable materials were utilised for construction of temple and halls nothing of this period has survived.

With the advent of the Pallava rule in South India paintings of comparatively permanent nature were executed on the ceilings of rock cut caves. Mahendravarma Pallava who ruled from Kanchi about 600 A.D. was a great connoisseur of art and was called "Chitrakarapuli" the tiger amongst the artists. Fortunately, the paint-

ings at Sittannavasal executed at his command are left intact to speak to the future generation the gaiety and splendour of art during this period. His successors continued the patronage and fragmentary paintings are still available in some of the temples.

The great Cholas who ruled the South after Pallavas rivalled the Guptas of the North in patronizing

By

R. NAGASWAMY, M.A.

art and literature. The rhythmic and graceful paintings of Tanjore Brahadeeswara Temple built by the great Raja Raja Chola is the best example of this period. The Vijayanagar kings who conquered the South in about 1350 A.D. and their successors, the Nayaks, followed the footsteps of their predecessors with the result that large scale wall paintings continued to be the fancy up to the beginning of the 18th Century. Paintings repre-

senting various periods in the development of South Indian art, were copied from temples and are now exhibited in the picture gallery. We have no knowledge of the existence of miniature paintings, as that of Rajasthani or Mughal, though it is not quite improbable that some kind of illustrations to manuscripts might have been in vogue. There undoubtedly existed a traditional school of painters who prepared the ground on wooden support with gesso and executed paintings by embedding gold stipplings and colour pigments. It is not uncommon amongst this school to make use of pearls, precious stones, games, etc., for such purposes. This tradition has continued to exist up to the last quarter of 19th Century and has recorded a steady decline since then. The 18th Century paintings of this school are exhibited in the left side panels of the main hall, virtually marking the beginning of various schools exhibited in the gallery.

During the iconoclastic rule of Aurangazib, the painters of the Mohal school had to seek asylum in Deccan for their livelihood. Some of the artists migrated to Andhradesa, while some were appointed at the court of Tanjore. The Maratha Kings called Rajas held sway over Tanjore about 100



years from the middle of the 18th Century and due to the patronage of these rulers the Tanjore school of art was ushered in. But the Tanjore school had a different setting and the characteristic of the traditional and Rajput schools were met and debased by influences from outside India. The former impersonality of the figures was lost. Like the Mughal school, the Tanjore school became almost completely human with Rajas and Ranis dressed up as for a photograph and turned their eyes towards the spectators. Devotion and imagination were reduced to next to nothing. Yet in both the Andhradesa and Tamil schools the oriental love of elaboration in costume and environment remained. This school is represented after the traditional school of paintings on left side panels of the main hall.

Rajput Paintings.—The miniature paintings produced at the court of the Rajput kings from a distinct group and they were contemporary with the miniatures produced in the Mughal court at Delhi. From the middle of the 16th century to the end of the 18th, an extraordinary activity of the school produced an immense number of paintings whose complete total is still a matter of conjecture. Of these by far the largest majority are small of size. The chief quality of the Rajasthani paintings is their idealistic representation of the emotional aspects of the Indians. The figures of human beings and those of animals and birds are also idealistic. The themes are varied and sentiments of love and devotion are mingled with an exuberant joy in life, the common subject-matter being the Krishna legends. The most important class of the Rajasthani miniatures is the series of Ragamalas or paintings of the musical models. The best examples are those of the 17th century. The paintings, like the poems which they illustrate, represent situations of which the emotional colouring corresponds to the feeling or burden of the musical mode. These are exhibited in the sloping central cases, beginning from the 17th century Ragini paintings.

Kangra School.—Between the late 18th century and early 19th century, the whole Kangra valley and adjacent Punjab plains were filled with very sensitive and highly emotional band of artists who were

responsible for the ushering in of the Kangra school of paintings. The Krishna subject predominates in this school. Their chief feature is their expressive line in which they may be regarded as distant descendants of the Ajanta frescoes nine centuries earlier.

Mughal school.—The Mughal emperors were enlightened patrons of art and they encouraged the art of painting. Akbar and some of his successors are said to have learnt the art themselves and invited master artists to their courts for illustrating many a masterpiece of Sanskrit and Persian literature. Among these illustrated works are the Hamsa Nama, Ramayana, the Akbar Nama and other works. During its earlier phases, Persian influence was predominant while at later times it yielded steadily to indigenous influence. Religious and metaphysical ideas which were predominant in Rajput paintings did not enter into Mughal paintings which confined itself to visible and tangible things not thought of or imagined. Its chief subject contribution to art is its gallery of contemporary portraits, small and in water colour of the Mughal emperors and their eminent contemporaries. These were painted realistically without the atmosphere of symbolism though with a conventional departure from the normal in the halo round the head of royalty and the artificial arrangement of the feet. These find their place on the other side of the sloping cases.

Deccani School.—The deccani paintings are an off-shoot of the Mughal school, which flourished during the 17th and 18th centuries under the patronage of local rulers of the Deccan states of Golconda and Bijapur. Portraits, Ragamalas and book illustration formed the subject of this school as was also large scale paintings on canvas. Two specimens of paintings on canvas are included in the exhibits. Representative paintings of this school are exhibited at the right side corner panel of the main hall.

Paintings of Ravi Varma and allied School.—The extreme of foreign influence in the development of Indian paintings was reached with the advent of Raja Ravi Varma when he won the British Governor's prize in 1873. Though he copied the western technique, Ravi Varma choose for his subjects, themes

from Indian mythology. Because of his westernisation, he was not popular with the revivalists of Bengal. His competently drawn illustrations of legends reached a wide public and fixed at least a minimal limit of technical adequacy for this type of production. His son, Rama Varma and a host of others carry on the Ravi Varma traditions. Amongst his paintings exhibited here, Sakuntala and the Miser speak of his elegance.

Modern^o paintings.—A revivalist school of paintings was started in Calcutta by E.B. Havell and Abanindranath Tagore who wanted to bring back to life the lost traditions of ancient Indian paintings. The prominent artists of this school are Nandalal Bose, Roy Chowdhury, Hundal and others. The works of these artists are characterised by a striving after the perfection of draughtsmanship and suggestion of spiritual significance unlike the ultra realistic delineation of subjects in western paintings. Further great stress is laid on traditional technique and the choice of subjects from India life.

The revivalist school of Bengal is represented here by D. P. Roy Chowdhury, Sarada Charan Ukil, Abdul Rahman Chaghtai, Promode Kumar Chatterjee and others. These are exhibited in the right side panels of the main hall.

The Madras school of arts has been able to discover a number of promising artists whose works are considered to be of a very high quality. Amongst these artists are K. C. S. Paniker, K. Srinivasulu, P. L. N. Murthy, S. Dhanapal and others. The modern trend amongst some of these artists is towards impressionism, a judicious selection from nature and a sketch improvisation rather than imitation. The near view that emphasised form is replaced by the distant view of objects seen out of door under the influence of light and atmosphere. Outlines are replaced by opposing patches of light and darkness. At the rear hall of the gallery, are exhibited the paintings of this school.

Recently yet another group of artists sought to revive the art traditions of rural India. The most important artists of this school is Jamini Roy Calcutta. Two of his paintings find a place amongst the exhibits.

THE NATIONAL ART GALLERY

V. N. SRINIVASA DESIKAN.

In the words of Dr. I. H. Consins the purpose of the National Art Gallery of Madras is to give the public the opportunity of enjoying works of art produced in and related to India, works of special distinction in subject and style. It was to fulfil this objective that the Art Gallery was established in 1951 in the Victoria Memorial Hall. The name of the 'National Art Gallery' was suggested by His Highness the Maharaja of Bhavanagar, the then Governor of Madras. The exhibits consist mainly of examples of Rajput, Moghul and South Indian paintings. The gallery was inaugurated on 27th November 1951 by Sri Pandit Jawaharlal Nehru, the then Prime Minister of India, as a part of the Centenary celebration of the Government Museum. To start with a small number of bronzes, paintings of different schools, metalware, wood carvings ivory and textiles were transferred from the Museum to this National Art Gallery at the time of inauguration. Since then, the collections have been considerably enriched by the purchase of paintings from time to time this the special committee of National Art Gallery appointed in 1951.

The exhibits that are available in National Art Gallery are not arranged chronologically, but they are displayed with reference to their importance, taking into consideration their interesting features.

In Room I, the paintings of Ravi Verma and allied schools and Deccan schools are on display. Then two large paintings showing the army of a Muslim ruler in procession are interesting. These two paintings represent the old style of Muchis of Cuddapah. Sakunthala and the Miser both by Ravi Verma are representative of his great talent.

In Room II, there are displayed select specimens of wood carvings, belonging to temple cars, Bidriware, Sandalwood carvings metal ware, ivory carvings and textiles.

In the Main Hall, the exhibits mainly consist of paintings and bronzes. On the left side of the Hall paintings of traditional school of South

India and on the right side modern paintings are on show. Representative collections of N. I. School, are on view in the sloping cases and in the two modernised verities cases. A few master pieces of South India Bronzes—Natesa for Tiruvelangadu and Rama jump of Vadakkuppa-maiyur are in the centre of each of using and in the four corners.

Modern paintings and bronzes are displayed in Room III—Recently a gallery was opened on the first floor of the rear room to accommodate the



ever increasing collections. The purpose of this gallery is to display the latest addition from time to time once a year.

Modern paintings are represented by the works of D. P. Roy Chowdhury, Sarada Charan viii, Churgtai, K. C. S. Paniker, K. Srinivasalu, P. L. Narasimhamurthi, Kodur Ramamurthi, S. Danapal, L. Munuswami, N. S. Berdre and a host of others. ☉

ANTHRO- POLOGY SECTION IN MADRAS MUSEUM

The Prehistoric antiquities consists of the stone implements of the Palaeolithic, Microlithic and Neolithic people mostly from the Peninsular India collected by Bruce Foote, Manley, Krishnaswamy and Aiyappan. The valuable foreign stone artifacts were got on exchange and were obtained from England, Japan, the United States of America and Egypt, France, South Africa and Congo, Indonesia and China. The prehistoric collections made by Bruce Foote, over 4,000 pieces from all over India, are notable and were purchased by the Madras Government at a cost of Rs. 40,000 in 1904. The cleaver, the first stone artifact which was collected by Robert Bruce Foote at Attirambakkam in 1863 is on display in this gallery.

The proto-historic antiquities start with the chalcolithic culture from Mohenjodaro and Harappa such as the copper and stone, tools, ornaments, household articles, weights, seals and religious objects.

The Iron Age collection in South India is represented by the funerary objects and remains collected from Mysore (R.B.B. Ranfill), Coimba-

tore (Staney), Anantapur (C. Cardew), Malabar (F. Fawcett), North Arcot (H.R.P. Carter) and Chingleput and Tirunelveli (Alexander Rea). The female bronze figure discovered at Adichanallur is the earliest of the bronze figures known so far. Another interesting exhibit in this gallery is the Ram Sarcophagus from Sankavaram, Andhra Pradesh, which is just like a ram in size and structure but with six legs. The Ram is considered to be the carrier of the soul from this world to the other. In the centre of the gallery is a model of a megalithic cist burial, prepared in the Museum on the basis of excavations done at Brahmagiri in Mysore.

ETHNOLOGY :

The Ethnology gallery, I, till 1959 was crowded with vertical show cases but subsequently in 1960 under the Third Five-Year Plan and with generous grants from the Government of India, reorganisation was started and resulted in modernised built-in wall cases with suitable interior colour schemes and concealed lighting. The material possessions of each tribe have been arranged in each modernised built-in case, depending on the level of cultural and economic set-up, such as the food gathering (Kanis, Mudugas, Gadabas and Kadars), the hunting (Khonda), the agricultural (Saoras, Gadabas and Koyas) and the pastoral life (Todas and Lambadis). The bust models of Kadar, Saora and Toda prepared recently in the plaster of Paris are also on display in their respective cases and life size plaster cast models of the Lambadi woman is another attraction in this gallery. The Gallery's ceiling was renovated recently and provided with decorated zinc sheets to add beauty to the gallery.

The Ethnology gallery II was modernised in 1963-64 under the programme of reorganisation and



Ram Sarcophagus

development. The pattern of construction of the built-in wall cases is exactly the same as in the Ethnology gallery I but the cases are not the same sizes and out of twelve such cases three cases are smaller, due to space restrictions. In this gallery the material culture of the tribes such as the chenchus, kotas, Khasis, Nagas and Garos, tribal and rural jewellery, writing and fire making implements, fighting and hunting appliances, Bhuta shrine figures and the returning and non-returning type of Boomerang of Kallars and Maravars are well displayed.

FOLK ARTS:

The folk arts or the Kathakali gallery is intended for exhibiting materials pertaining to folklore, mythology, dance and drama. The four life size wooden Kathakali figures were renovated and repainted in 1963 and they with actual costumes and colours, portray the four principal characters of the Kathakali dramatic art in Kerala. In 1963-64 twelve small modernised built-in walls with panelled front cases were added. The three sorcery figures of the Moplahs of Kerala show that the people still have belief in sorcery and magic. A selective display of Silver votive offerings of Muslims, Hindus and Christians in South India form an interesting attraction to the visitors. Two temple cars, a Seshavahanam and a temple procession, exhibited separately in the cases, correlate the social and religious observances of the people in times of festivals.

The Physical anthropology gallery is of recent origin and still to be augmented. The plaster cast reproductions of the Australopithecine (Africa), Pithecanthropus (Java and China) and Neanderthal (Europe) are exhibited here to derive the evolutionary line from where the

human being has originated. The study of Anthropometry and its importance are dealt with, in the form of charts and photographs bringing out the important diagnostic characters like stature, complexion, hair, lip, nose, eye, jaw, head and face on the basis of which races are classified and grouped. Two enlarged photographic colour charts depicting the scene of the 'Ice Age' and the 'Primate family tree' adorn the gallery in the centre.

ARMS :

The collection of arms was started in 1865 with the arrival of Tanjore Armoury weapons. They include the historic period objects like the spears, shields, chain shots, mail armours, swords, daggers, choppers, elephant goads, mace heads, arrows, etc. While the fire arms of the East Indian Company such as the flint locks, match-locks, musketoons, etc., are now suitably redisplayed on the four renovated mosaic plastered walls of the gallery. The Notable exhibits among them are the two guns inlaid with gold, once presented to the Serfoji Maharaja of Thanjavur by the East India Company in recognition of his loyalty and service to the company rulers. A few huge cannons captured at Manilla, Mysore and Tranquebar are stationed around the Front Building, in an effort, at the infant stage, to establish an open air cannons corner or Museum. A brief catalogue on the benefit of the public and those who are interested in arms and armoury.

MUSICAL INSTRUMENTS :

The collection of musical instruments in the gallery includes the usual types-autophones, aerophones, chordophones and memberanophones. The most interesting exhibits are the Pancha Mukha Vadyam a huge bronze temple

drum with five faces as striking surfaces from Tiruvavur temple and the Burmese harp or saun resembling the "Yazh" mentioned in Tamil classical literature. Recently added to the collection were a number of models of "Yazh" Veena and Sitar varieties of ancient times prepared accurately and skillfully. The nagaswaram, used and played by the Nagaswaram Vidwan, the late Thiru N. K. Elumalai Pillai of Madras, was lately added to the collection and this is the first instance, wherein a musical instrument of a vidwan was gifted to the Museum.

The Anthropology Section was started in 1871 on the recommendation of the Trustees of the Indian Museum, Calcutta and communicated to the Madras Government Museum, to secure arms, tools, iron implements, potteries associated with the burials in South India.

In addition to the collection of the Ethnography and Prehistoric Archaeology received from district authorities, the valuable and significant finds and collections of Robert Bruce Foote were made available to this section of the Museum. Dr. Edgar Thurston (1885-1908) has the Superintendent of the Museum established an anthropometric laboratory and began an Ethnographic Survey of the tribes of Southern India which resulted in the publication of the seven monumental volumes of the "Cases and Tribes of Southern India". He started displaying the Ethnographic objects in the Front Buildings from 1916 onwards. ● ● ●

BOTANY SECTION

There are very few museums in India which have galleries exclusively devoted to Botany in their collection. The Government Museum at Madras is thus unique in having a good collection of botanical specimens, a major part of which is displayed in the galleries. The Botanical gallery consists of rooms, each devoted to Ecological Botany, Systematic Botany and Economic products. Besides these specimens on display, there is a reserve collection Botany section.

Specimens are acquired for the section either through the Curator, going on tour to the Locales where they are available or as gifts or purchases from other institutions and collecting them such as Agriculture Department, Forest Department and other museums. The specimens thus collected are preserved either wet or dry.

The importance of plants in our daily life can hardly be over-estimated as most of the things we need, have got their origin in some plant part or other. Our country is very rich in natural resources, and the need for a good number of imports can be overcome with the help of a knowledge of the various plants and parts of plants from which the raw materials can be tapped to the best advantage. In the Botany galleries, the actual specimens or their photographs, or models, or diagrams are placed before the public, with explanatory labels which are brief and to the point. The different groups of exhibits are explained by descriptive, group labels which serve as a good guide. The English and Latin labels are provided with translations in Tamil (the regional language) wherever possible.

The Botany galleries are divided into sub-galleries, the topics illustrated in these galleries being broadly divisible into (a) Systematic Botany, (b) Ecological Botany and (c) Economic Products.

Systematic Botany

In the part of the gallery devoted to Systematic Botany the exhibits are arranged in their natural order, starting with the primitive Cryptogams. They are too many to be referred to in detail, the families of flowering plants alone numbering over one-hundred-and fifty. They

IN MADRAS MUSEUM

V A BEST ONE OF ITS KIND IN THE WORLD

are of interest not only to the botanists but also to the general public. To mention a few, a couple of Hemp Plants (*Cannabis sativa* Linn.) which are exhibited with root and all, are rare objects, since their cultivation and possession are a closely-guarded monopoly of the Government. There is a toadstool of clumped growth and gigantic size. It is one foot tall, the stem (known as the Stipens) having a circumference of eight inches, and the top (known as the Pileus) having a diameter of seven inches. It is a giant of its kind, indeed! There are also huge bracket fungi which grow from the trunks of trees, appearing like protruding wooden shelves. They are generally confined to forest tracts and are not commonly seen by the public. The largest specimen

in the collection, measures more than a foot in diameter and at least three-and-a-half inches in thickness.

A group of mosses, the amphibians of the plant kingdom, form another source of attraction. The specimens hail mostly from the Nilgiris and the Bababudens. Two of them from Madras are given a special treatment and preserved with colour. A life-cycle of these plants, sketched in black and white, lead the visitor on to the academic fields. A specimen of moss, preserved dry and mounted on a card, is shown with its different parts labelled. The interest in these tiny plants is stirred by a set of eight, enlarged models that portray many of the important features. Bunches of inflorescence and fruits of Coconut palm and Arecanut palm, offer a close-up view, Herbarium sheets of the flora of the City of Madras are accommodated in drawers which are specially devised for them. Residents of the City derive help from these exhibits in identifying plants which they see in their neighbourhood.

Ecology Section

In the section devoted to Ecology in the botanical galleries, the exhibits illustrate the changes in vegetation during the formation of swamps from stagnant water, the growth of grassland and scrub vegetation of rocky soil, the vegetation in dense evergreen forest areas, the vegetation on sands, the struggle among the mangroves for existence, weeds growing in the sea and the phenomenon of cross-pollination through the agency of insects. The vegetation on swamps include insectivorous plants which command popular, interest. These plants have taken to an insectivorous habit for obtaining their share of Nitrogen as the nitrogenous salts in the swampy soils get frequently leached out by rain and run-off water. The Nitrogen contained in an insect is made into Ammonia after the insect is trapped and starved out to death. The inner-lining of the insect-traps (which are only suitably modified leaves) have the special ability to absorb Ammonia, both as vapour and as solution, *Drosera Burmanni* and *Nepenthes distillatoria* are the

insectivorous plants on display. Models and charts of the insect-trapping mechanism in *Sarracenia purpurea*, *Dionaea Muscipula* and *Nepenthes* render the subject easy to understand.

The exhibits illustrating the vegetation in the dense evergreen forest areas, include a tree-bark on which lichens, mosses, a clubmoss and even flowering plants (an orchid and a peperomia) are seen growing. The exhibit is only a typical instance of the competition for space in the dense evergreen forests.

The Mangrove—

The way the mangroves solve their life-problems is an interesting

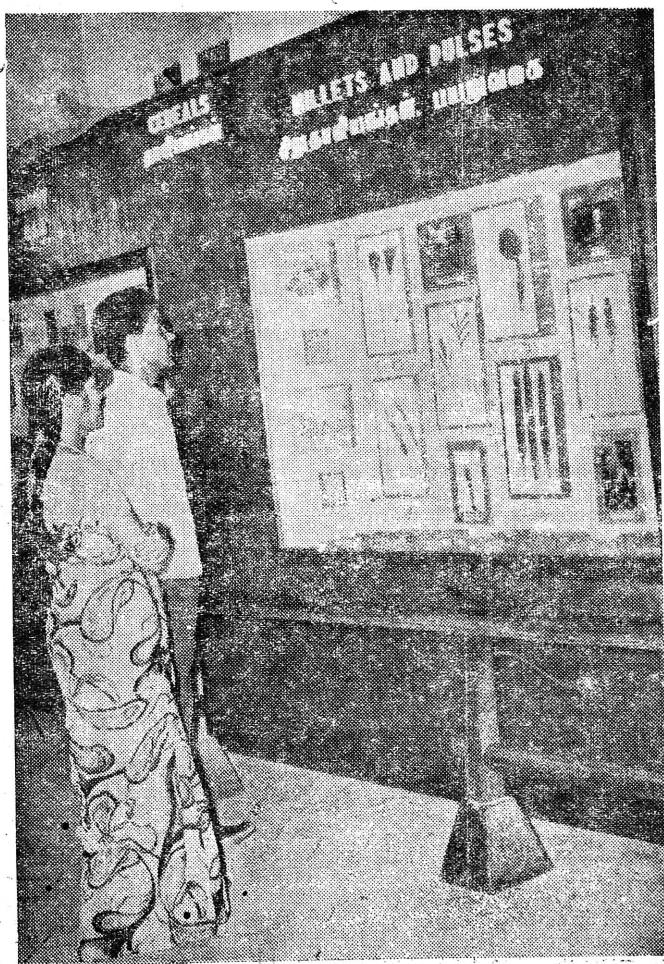
subject for study. The soil of the mangroves is loose and muddy without any air-space, and in the form of marshy islands in shallow, stagnant sheets of brackish water. The exhibits illustrate many of the special devices with which the mangroves keep their centre of gravity as low as possible, by not attaining any great stature. Their roots radiate generally for long distances; and in certain cases they spring from the sides of the stem, run horizontally, curve down and strike the soil at a distance.

An ecological exhibit of great interest to the lay men, is a model to demonstrate insect-pollination of flowers. This model is exhibited in a small separate show-case. It illus-

trates how the phenomenon of cross-pollination is generally effected in flowers by insects. It consists of a fixed model of a two-lipped, tubular flower (*Salvia*) which is cut up longitudinally. A stamen is movably fixed in the flower. There is also a model of a bee resting apparently on the expanded lower lip of the corolla. The manipulation of a small handle can take the bee into, or out of, the flower, when the (movable) stamen acts as in the real flower.

The economic Products gallery is by far the most popular, since both the preceding galleries call for at least some background of botanical knowledge to appreciate the exhibits, and since a vast majority of the specimens are displayed in special, built-in wall show-cases that are designed on the most modern lines. This gallery consists of vegetable raw materials of all kinds, including agricultural products, timbers, minor forest products, etc. The exhibits are divided into several groups according to their uses. The abundance of information furnished to botanists, industrialists and the general public, can be appreciated best only by a personal visit.

There are over 300 exhibits of the various South Indian timbers. The most impressive among them are transverse sections of large trunks of two timber trees. One is rose-wood (*Dalbergia latifolia*) and the other, teak-wood (*Tectona grandis*) the circumferences of the former being twenty-one feet, while that of the latter, twenty-three feet and nine inches. The rose-woods is claimed to be 200 years old at the time of felling, and the teak-wood a little over 500 years. The age is calculated by counting the number of annual rings on the specimen, each ring corresponding with a growing season of each year of the plant's life. Staring from the centre, every hundredth ring on the specimen of teak-wood, is painted in white so as to represent the circumference of the plant at the end of every 100 years of its growth. The size of the trunk in the year, 1400, when the tree began growing, is indicated by a dot. Mentioned on the specimen, are also a few historical events, with dates, that took place during the life-time of the tree. The marking rouse some special interest, even in the



lay visitors, in the study of the economics of timber.

A skeleton of the White Sandalwood tree (*Santalum album* Linn.) is the very first exhibit to greet the visitor at the head of the stair-case leading to the Botany galleries. The skeleton (or the heartwood, as it is more accurately called) is exhibited in two parts, the portion of the main trunk alone forming one part, and the rest of the skeleton forming the other part. Since both these parts are exhibited one beside the other, it is easy to estimate the height of this particular tree (when in life) as about thirty feet. The sandalwood oil which is so highly valued for its fragrance all the world over, is extracted from the heartwood which is also highly valued for carving purposes. Some of the principal types of timber suited for making toys are exhibited in the show-cases devoted to toy-manufacture. The changes they undergo before taking up the shape of the completed toy, are also illustrated stage by stage.

A cluster of bamboo rhizomes with the bottom-most internodes exhibited in this gallery, illustrates the mode of vegetative propagation in bamboos. The yellow stems hidden by green leaves and their dark shadows give ample protection to the similarly coloured animals the most dreaded among them being the tigers. The stems of different species of bamboos are of different sizes and strength; and the stems of some of the Chief species are well preserved and displayed in the galleries.

The group of exhibits of articles of food contain about fifty different strains of paddy (and rice), wheat grains, different kinds of millets, etc. They are attractively displayed and have been rendered more instructive and interesting with the aid of photographs. Many of the spices and condiments on show are not new and include also such important articles as the pepper, cloves, cardamom, etc. It has been found in practice, that these common articles, while on display rouse fresh interest and enthusiasm among the visitors. Included in their midst is also a newly-imported material the Chinchweed (*Pectis Papposa*) it is an American Plant and its cultivability in Madras has recently been attempted with favourability in

Madras has recently been attempted with favourable result. It can be used in flavouring food and beverages.

The beverage group is well represented among the exhibits. Plants yielding the materials for the three popular drinks, cocoa, tea and coffee, have been given the place they deserve. There are two specimens of pods of the cocoa plant (*Theobroma cacao*, Linn.). Of them, one is entire and the other, cut open to show the inner beans which are cured, roasted and ground to form the cocoa of commerce. The exhibits illustrative of the tea industry include actual specimens and photographs relating to the cultivation and processing of tea. Interesting among them, will be found the adulterants too, some of which are rather shocking indeed. The coffee series includes a map showing the coffee cultivation areas in South India, and photographs and specimens of cultivation, harvesting, etc., of this useful crop.

In the Economic Products galleries, the sea-weeds are also exhibited, as of economic importance.

The narcotics are given the place that is their due in the galleries. The tobacco industry is as adequately represented as possible.

The principal exhibits of raw materials for raiment, are the four chief kinds of commercial growths of Indian cotton. The group is rendered interesting with the aid of photographs of cultivation and ginning of cotton, and with the different strains dissected to show the staple length. The most interesting exhibit for the lay visitor, however, is the miniature model of a handloom. A small piece of cloth is also shown half way in the process of being woven by this model. Plant materials that are used as dyestuffs for several purposes, including designs on cloth, are also exhibited. Many of the dyes which are obtained from the indigenous plants, are valued highly for their permanence.

Manufacture of leather goods is an important industry in the fore in India, today. Leather is mainly obtained by tanning the skin or hide of an animal with the help of certain raw materials. The raw materials

may be certain chemicals or minerals or plant materials. The plant materials required for the tanning industry form a small but important group in the galleries.

Medicinal plants and their products occupy a considerable amount of space in the galleries.

The exhibits of domestic articles go to show to what extent the dexterity of our artisans can shape seemingly trifling materials into beautiful handicrafts. We have the mats and baskets made of rattan, thatch grass, palmyrah leaf, etc.

A vast and choice collection of vegetable fibres are attractively displayed and grouped into (1) Jute and its substitutes, (2) Cordage, (3) Brushes (4) Coir and (5) Miscellaneous fibres. All these five groups consists of both raw materials and their finished products.

Raw materials required for making paper and rubber are also exhibited. The exhibits relating to the manufacture of paper show how most of the waste that are thrown into the dust-bin, can be profitably utilised in making paper. The exhibits connected with rubber-manufacture are interesting as many of them cannot be commonly seen.

Other Activities:

Special exhibitions are periodically arranged in order to the new accessions and important older collections. Participation in educational exhibitions is becoming more and more frequent. Guidance on matters of collection, identification, preservation, storage, etc., is freely given (in the form of advice or references, to educational institutions, museum-keepers, industrialists and others. Periodical demonstrations are held to organised parties of teachers, on how best they could enable their pupils to make a profitable visit to the galleries. Short condensed courses on organisation and maintenance of school herbaria and botanical museums, are also conducted for batches of teachers from different parts of the State. Personal help round the galleries is freely given to illiterate visitors if they turn up in organised batches. ●

The 12-year Perspective Plan in Education, Science and Technology, which is based on an appraisal of the system in retrospect will conform to the following objectives, principles, stages, structures and programmes.

The present objectives of Tamil Nadu Education, Science and Technology—the development of the personality of the child; the understanding of the culture and history of the State, the country and the world; the instruction in the moral and spiritual values of the country; the acquisition of scientific, technical and professional skills; the promotion of research to push back the frontiers of knowledge and solve the technical and developmental problems faced by the State; the democratisation of education through meeting the growing demand for education and providing social compensation for the condition of the poor majority of the State's population—all these will be continued. In addition, a fresh and major objective of the system during the next twelve years will be to relate directly the right to education with the right to employment in the State and the country and to relate the various stages of the education and training system to the graded skill demands of society.

PRINCIPLES.

The principles on which the educational model for the future is based are those of continuity and renovation, of sanctity of contracts, (so that no one now employed will be discharged from service because of any proposed restructurisation

GOALS OF EDUCATION, SCIENCE AND TECHNOLOGY IN THE PERSPECTIVE PLAN

or reform) and of gradualism so that the necessary transitional period is allowed for in the innovations proposed. To this end, the system will provide.

Complete education, free to all in the age-group, 5-14 ;

Make the minimum skills imparted through the equivalent of four years of schooling available to all the people of Tamil Nadu ; increase the enrolment of girls and reduce wastage among them ;

Raise the quality of education and science at all levels ;

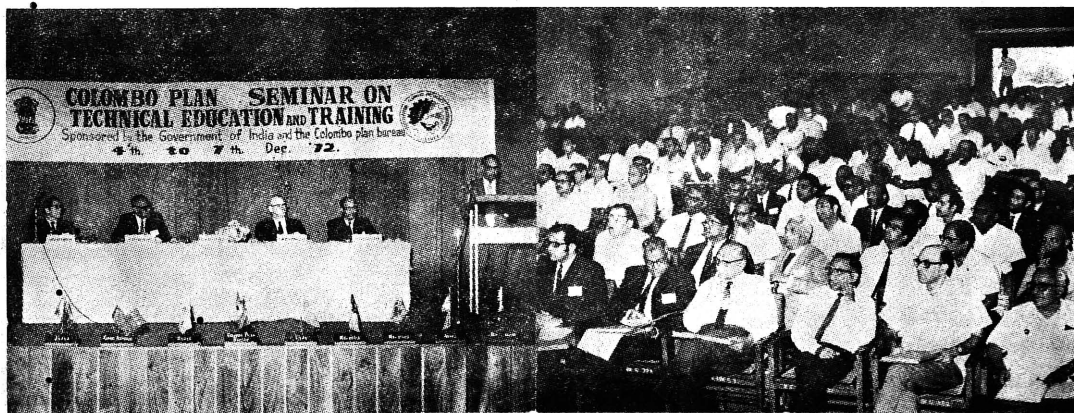
Disaggregate the education and science system so that it corresponds to the skill demands of society and allows students multiple entry, exit and re-entry points to come into, leave the school system for employment purposes or re-enter it without being described as drop-outs ;

Co-ordinate with a view ultimately to merging in a single system of in-school and out-of-school education and training ;

Provide compensatory educational facilities for the disadvantaged sections of society ;

Make education and science functional and relevant to Tamil Nadu and the India of to-day and to-morrow ;

Redeploy the educational expenditure in the State from all sources—State and Central Governments, the University Grants Commission, parents and private sector—so that



they are not wastefully consumed in linear expansion but become productive of educational excellence and of a purposive and efficient employment orientation.

STAGES, STRUCTURES AND PROGRAMMES.

The problem with the present structure is that it is too long and not long enough. It requires 11 years of schooling and six years of college education with each year consisting of 220 working days for primary, 200 working days for secondary and 180 working days for college education and each day consisting of five working hours for all of them. A second problem is that the present aggregation of the structure into three stages, 1 to 5, 6 to 8 and 9 to 11 at the school level and 1+2+2 at the college level does not conform to the needs of students or to the skills demanded by society and leads to what has been termed as massive dropouts.

It is therefore proposed :

That the school course be made of ten years' duration as in the other States of the Union ensuring uniformity in curriculum and quality of education even while aiming at higher standards; that the instruction time—the number of hours and days—be extended for this purpose as appropriate. The 10-year schooling provided free to all in the State will be disaggregated into four or five stages to enable students smoothly and naturally to leave school at various points for employment or work at home and re-enter school;

The Minister for Education of Tamil Nadu is seen addressing a distinguished and large audience at Rajaji Hall on 25-11-72, on the occasion of late Nehru's birth day.

That out-of-school education be provided to all who leave school before standard IV and to the 143 lakh adult illiterates in the State as the equivalent of five years' primary schooling;

That the enrolment of girls be increased to equal that of boys, that the rate of wastage in their school performance be reduced through (i) functionalisation of their school curricula; (ii) a programme aimed at changing social traditions acting as a constraint on women's education; (iii) the provision of additional quarters for women teachers in rural areas; and (iv) the free distribution of cloths to girl students;

That a gradual merging of school and out-of-school education be encompassed through the use of common curricula, teachers and instructors, buildings, equipment libraries, laboratories and farms and other agencies which will also provide continuing education—both general instruction and vocational education—to those who need it and wish for it, through correspondence courses, evening classes, the radio and television. These programmes in both general and vocational education and training will be certified by educational diplomas;

That curricula, teaching methods and learning techniques be reformed so that they become functional to varying learning abilities, teaching technologies and to urban and rural contexts and to the economic, societal and cultural realities of Tamil Nadu. Science education at all stages will be up-graded and modernised;

FUNCTIONAL BIAS IN SECONDARY EDUCATION.

That secondary education be vocationalised and be made employment oriented through a rapidly increased network of technical high schools, comprehensive schools and through the introduction of "streaming" from standard VIII into various educational and vocational specialisations and through the continual entry and exit of students into and from the school, the farm, factory and office;

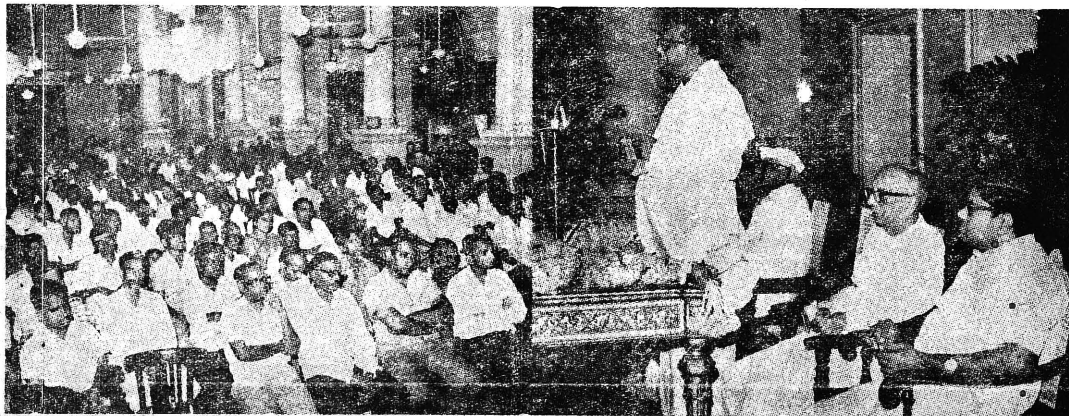
That standard X become the terminating point of school education for a majority of students (as at present) who will then be able to improve and continue their skills through out-of-school and out-of-college education and training programmes;

That internal assessments be used through the school years including standard X, at which stage either a public examination of the students' general learning capacity be organised or schools be given responsibility for such an examination, under criteria and guidance to be established by the Board of Secondary Education;

Fitness Test for Higher Education.

That admission to higher education be on the basis of fitness and aptitude tests conducted by each institution under the guidance of a central authority.

That higher education be organised on a 2+2 or 3 structure with two years for the intermediate course, two years for the degree,



two years for post-graduate studies or three years' degree with honours. Each stage will correspond to an ascending order of skills, for which the preparatory language learning will be completed in the intermediate course, the degree and post-graduate courses being subject-centred or professional. The professional degree in medicine, agriculture, engineering, etc., will continue their present time-period.

That all undergraduate education in the State be entrusted to a statutorily constituted autonomous State Council of Academic Awards with two or three affiliating regional academic bodies or two or three new affiliating Universities. This Council or these Universities for Undergraduate Education will put into effect a system of autonomous colleges the semester system and internal assessment procedures.

That the Universities of Madras, Annamalai and Madurai be developed into centres of excellence in post-graduate teaching and research.

That a technological University for diploma, graduate and post-graduate engineering education be started and the Tamil Nadu Agricultural University be developed as a multi-faculty institution covering the animal sciences, agricultural engineering, home science, forestry, fisheries, basic sciences and humanities in addition to its existing departments in the agricultural sciences.

That scientific and developmental research be promoted through the starting of a

(1) Tamil Nadu Science Foundation ;

- (2) Tamil Nadu Academy of Basic and Applied Sciences ;
- (3) Hall of Science and Industry ;
- (4) Information Storage and Retrieval Centre ;
- (5) Computer Centres ;
- (6) Centre for Ocean Engineering and Marine Sciences ;
- (7) Institute of Management Training and Development ;
- (8) Material Testing Bureau ;
- (9) Centre for Automotive Engineering and Development ;
- (10) Centre for Urban Engineering.

That an educational planning machinery by established, the State management modernised, administration decentralised with appropriate training programmes, selection and promotion procedures and a smoothly functioning grants-in-aid administration.

Finance.

Educational finance in the State presents two problems which must be resolved in the Perspective Plan. First, its rate of growth has been continuously increasing for both the State and the parents, fast reaching the ceiling level. Secondly, its present distribution and use or misuse between various levels and forms of education have involved an element of dysfunctional disinvestment.

It is proposed that State finances for education be redeployed to provide :

Free education up to the terminal school standard X ;

Free out-of-school education, so that the 51.2 per cent of wasters from primary school and the 60

per cent illiterate adults obtain the minimum schooling ;

Improved science and craft education at school ; and

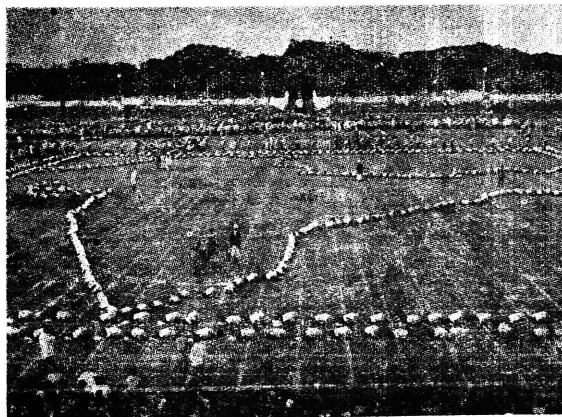
Scientific and developmental research programmes and post-graduate educational and research at the Universities.

It is further proposed that higher education be gradually returned to a system based on fees, alongside of an extensive scholarship scheme based on merit and/or poverty as decided by a means test.

There is a wastage of 51.2 per cent of students in the first five years of school and the dropping out of 53 per cent of students between P.U.C. and the first year of all degree courses including professional ones, which are traceable primarily to economic causes with academic ones playing a secondary role, call for an educational programme which can be carried to the places where the drop-outs live or are at work. In this context it may be noted that the term "drop-out" is pejorative, when, as often happens, it is either the school or the system which has failed to engage and hold their attention. "Push-outs" would be a more appropriate term.

In financial and skilled manpower terms, the waste in professional education is even more serious. The wastage in engineering education works out to an average of 18 per cent over a period of 10 years and that of polytechnic education, to 20 per cent. The need to reform and restructure professional education in order to avoid this sizable wastage is thus clearly urgent.*

Dr. V. R. Nedunchezian, Minister for Education and others seeing the Children's Parade conducted in connection with the birth day anniversary of late Pandit Nehru.





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THE SEMESTER SYSTEM IN ENGINEERING EDUCATION

During the last six years, efforts have been made to introduce progressive evaluation and the semester pattern in the engineering colleges affiliated to the Universities of Madras and Madurai. The introduction has been effected in stages and a combination of internal evaluation and external examination systems has been employed. Attempts have been made to build provisos into the regulations so that marks obtained in internal evaluation effectively influence the final result. At the same time, a minimum in the external examination is also prescribed for a pass to avoid any apprehension of undue favour being shown by any institution to its students. These procedures are being gradually worked out since it takes time for the teachers to take over a new system and work it and for the public to develop full confidence in its intrinsic fairness and that of the individuals involved.

It may be difficult to suggest common regulations for all the courses. Each course must be studied in detail and a suitable method of internal assessment introduced. It is inevitable that, in the initial stages at any rate, both external examination and internal evaluation must co-exist, and their relative importance has to be decided. The long-term objective should be the complete elimination of external examination and the introduction of an accreditation system to ensure the maintenance of standards.

An important step in this direction will be the introduction of a system of autonomous colleges. It is an important recommendation of the Kothari Commission, and offers vast scope for effective examination reform as well as systematic experimentation at least in a few chosen institutions. Uniformity in standards among affiliated colleges is an important requisite of internal evaluation. The principals of engineering colleges have arrived at the following guidelines in an effort to ensure some measure of uniformity.

METHODS OF ASSESSMENT.

A combination of the following methods of assessment will be used, depending upon which of them are suitable for individual subjects :

A.

- (i) Periodical tests ;
- (ii) Assignments ; and
- (iii) Tutorial problems.

B.

- (i) Oral test ;
- (ii) Project work ; and
- (iii) Laboratory records.

C.

- (i) Participation in seminars ;
- (ii) Regularity, punctuality and presentation ; and
- (iii) General proficiency.

ALLOCATION OF MARKS.

In internal evaluation, marks should be used to adjudge performance uniformly according to the following academic and other germane criteria :—

(i) Attendance, regularity, punctuality—10 per cent.

(ii) General proficiency, aptitude, presentation, participation in seminars and discussions—10 per cent.

(iii) Periodical tests—50 per cent.

(iv) Assignments, tutorials, laboratory records, reports and projects—30 per cent.

Attendance above the minimum prescribed by the University, punctuality in attending classes, regularity and promptness in the fulfilment of various academic tasks will form the basis for the award of 10 per cent of the marks.

Participation in seminars, discussions, general proficiency, aptitude, oral and written presentation and the overall assessment of the candidate by the instructor on the basis of the latter's contact with the student in and outside the class will form the basis for the award of another 10 per cent of the marks.

There must be at least three periodical tests in a semester. The number can be more. If there are 3 tests, the best of the tests may be taken into consideration, two tests out of three being the minimum. The allocation of 50 per cent of the marks for periodical tests will be common for subjects in which instruction consists predominantly of lectures, design, drawing or laboratory/workshop classes. The nature of the tests must be such that they can be conducted within the duration fixed for regular class lecture/laboratory/design and drawing. The staff member concerned must keep a record of the tests given and marks obtained for scrutiny by a competent authority.

The balance of 30 per cent of the marks are reserved for tutorials, assignments, design and drawing, reports, projects, laboratory work as well as oral examinations. The methods used will depend upon the subject. Assignments involving mere problem-solving will mainly be done in the class under staff supervision. Even in the case of design and drawing, report-writing, etc., only those categories of work which do not lend themselves to simple copying should be permitted to be done at home. Within practicable limits, care must be exercised to see that copying is not practised even through consultation and the guidance either from the staff or from colleagues need not be ruled out.

The minimum number of assignments for a semester should be three in the case of under-graduate classes and six in the case of post-graduate classes. Each assignment can have sub-divisions. The number of assignments should preferably exceed the minimum prescribed. The assignment can take the form of a set of problems, designs and drawings, the preparation of laboratory and other reports.

GENERAL GUIDELINES.

The faculty members must be informed about the need of keeping the evaluation objectives taking care

to see that the students are convinced that the evaluation is objective and systematic. In general the following points may be stressed :

- (i) records of tests, assignments and any other form of evaluation must be kept and should be made available for scrutiny by a competent authority ;
- (ii) the marks obtained in tests and assignments must be made known to the students at the end of each month in tabulated form. This is in addition to the marks given at the time of returning test-paper or assignments sheets ;
- (iii) the number of assignments and tests prescribed in the foregoing are the minimum ; effort must be made to base the final grading on as many valid methods of evaluation as possible.

Similar guidelines suited to the requirements of arts colleges may be worked out and implemented.

WORKING OF THE SYSTEM IN INDIAN INSTITUTE OF TECHNOLOGY.

The Indian Institute of Technology in Madras has from the outset nurtured the internal assessment system for the evaluation of the performance of its students. Its post-graduate courses (M.Sc./M.Tech.) were from the beginning operated on the semester pattern. The first degree course in the Institute, (B.Tech.) was run on an yearly basis during the first few years, and the switch-over to the semester pattern came about in 1969. All the instructional courses are now on the semester pattern.

Each academic year is made up of two semesters with 15 weeks of instruction. There are three weeks set apart at the end of each semester for the scheduling of the semester examinations (theory and practice). There is a winter recess of five weeks between the first and second semesters and a summer vacation of 11 weeks following the second semester.

The prescribed theory courses are conceived of as units of cogent material that can be presented over a 15 week period, typically at the rate of three hours per week. The laboratory courses also last 15 weeks and are usually held at the rate of

three hours per week or six hours per week, depending on the discipline and its requirements. The curriculum includes several practical courses, e.g., drawing and design, workshop, etc., with appropriate weekly loads of work.

The semester system has here been remarkably successful in its operation. Its potentiality for eliciting concentrated effort both from the staff and the student has been noted.

The only sufferers are those, students who fail to make the grade and cannot proceed from one semester to the next. They lose a year and there is an interregnum of idle time lasting six months. The Institute tries to turn this to good account by requiring those students to undergo training in an industrial establishment. The edge is sought to be taken off the demoralising effect that failure imposes. During the intervening period, the student has had the opportunity to go through a new experience instead of wasting his time at home or merely repeating his studies.

THE INTERNAL EVALUATION SYSTEM.

The Evaluation System at the Institute operates as follows. In each prescribed course, three class tests are held on dates which are spaced out evenly and announced at the commencement of the semester. If a student studies five subjects, he is scheduled to take a total of 15 tests during the semester. Leaving a couple of weeks free at commencement, each of the remaining weeks contain two tests or at least one. Of the three tests in a subject, the best two performances are taken into account for credit. This is to provide for possible absence, failure or poor performance by a student in one out of three trials and to avoid penalizing him for it. The tests are administered by the subject-instructor and are meant to test if the student is keeping proper track of the course as it progresses. It will moreover serve as a feed-back for the teacher who will then know if he is taking the class with him.

A given subject may carry tutorial exercises at the rate of one assignment per week. Every week's work counts towards the sessional assessment.

Where laboratory work is prescribed as a part of the course, the

actual work done in the laboratory, together with the reports of practicals and the oral examinations in the laboratory, contribute to the credit given for laboratory work.

The periodical tests, tutorial exercises and laboratory work are all taken together in a prescribed mix or proportion (such as 2 : 1 : 2) to determine the overall credit assigned for class-work. This accounts for 50 per cent of the maximum credit that a student can earn in course-time. The remaining 50 per cent comes from the semester examination on the subject. The latter may take the form of a theory paper ; it often includes a laboratory examination as well.

The sessional performance is adjudged solely by the instructor. In the semester examination, the instructor shares his work both in question paper setting and valuation of the answer-script-laboratory examination with an external examiner. The latter may be a faculty member from the same Institute, from the same Department or a cognate Department or from outside the Institute. He is expected to serve as a referee and adjudge whether the instructor has done his job fairly.

In practical subjects like drawing, and design or workshop, the student earns 50 per cent of the credit for his sessional work done over the semester, as judged by one instructor or a group of instructors, and 50 per cent for his performance in a practical examination-*vis-a-vis* held at the end of each semester.

In the post-graduate courses (M.Sc., M.Tech.), the instructor has the advantage of greater flexibility with class-work assignment. He may conduct one or more tests ; he may prescribe home assignments ; or he may pose a design problem. All this can make up 50 per cent of the credit. The semester examination, in which the instructor shares the work in question paper-setting and valuation of the answer books with an external examiner, accounts for the remaining 50 per cent.

In an overall assessment, both aspects, viz., the semester pattern and the internal evaluation, have been pre-eminently successful at the Indian Institute of Technology.

• The success achieved is attributable to the following considerations :

(a) The Institute is wholly residential. All the students, without exception, live in the hostels. Most of the Faculty live on the campus. Amongst the students, there is a great measure of uniformity in living conditions and pattern of work. There are ample opportunities for student interaction with the Faculty outside of the classroom ;

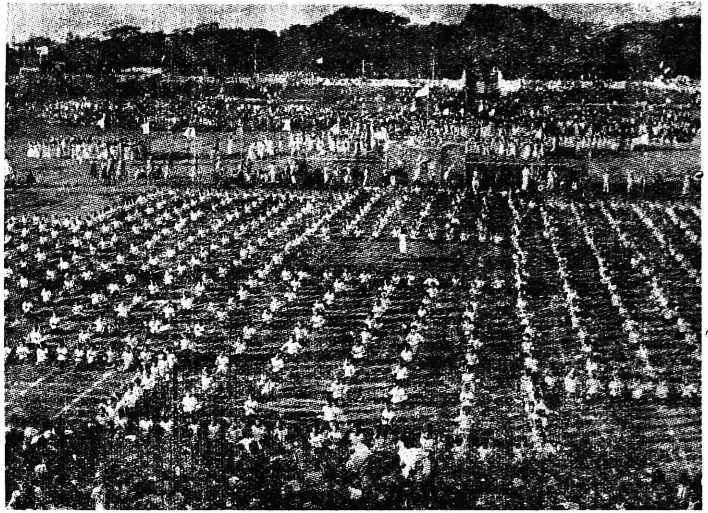
(b) All the students in a given discipline are handled and evaluated by a group of teachers belonging to a single institution ;

(c) The autonomy of the Institute and the character of its Senate, which is in a position to take quick and positive action on any academic issue that is placed before it, create confidence and are a guarantee of fast remedial measures.

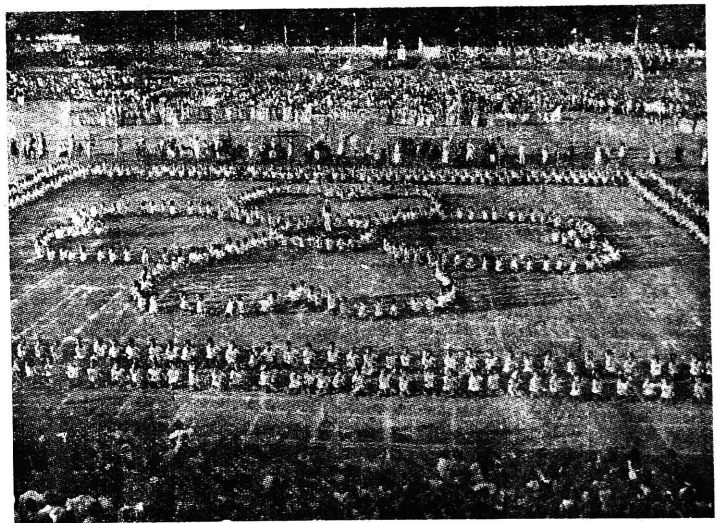
The assessment of students' performance, when they belong to a number of institutions/colleges that are physically separated from one another though affiliated to a single University, is beset with greater complexities and difficulties in actual implementation. Several safeguards and special steps to introduce uniformity in standards of work-allocation and the apportioning of credit will be essential. The acceptance by the Faculty of the intrinsic merit of the system and the willingness, following this, to maintain standards in an impartial and objective manner, constitute the foundation of the system. The student community will always adapt itself to a system that allows credit to be accumulated over the whole duration of the study period on the basis of steady, sustained work at an even pace for it quiets the fear and the associated perils and uncertainties of a single annual examination as the sole determining factor.

The difficulties in implementing the system in the case of an University affiliating a number of institutions or in extending it to arts colleges or courses (both post-graduate and undergraduate) may be considerable, but can be overcome in a phased manner through determined effort. The task must be seen as a challenge, but there is no doubt that, if it is faced up to, our educational process will gain new momentum and a sense of purpose. ●

CHILDREN'S PARADE ON 25-11-1972



This year the Children's Day Celebration in Tamil Nadu was conducted in a grand manner on 25-11-72, Panoramic views of the Children's Parade conducted at Nehru Stadium are picturised in the Photos above and below.



N.C.C. IN TAMIL NADU

Today the N.C.C. Directorate at Madras has six Group Headquarters, two of them located at Madras and remainder at Madurai, Tiruchirappalli, Coimbatore and Pondicherry. Under each Group there are 8 to 10 Senior Division units. The strength of these units varies from 200 (Company) to 1,600 (Battalion of 8 Companies) and to these Senior Division units are affiliated a number of Junior Division troops with a cadet strength of 100 each. There are four wings in the N.C.C., the Army, the Navy, the Air and the Girls. The Army Wing comprises mostly of Infantry units and some technical units. The technical ones are Armoured, Engineer, Signal, E.M.E. Medical, Remount and Veterinary units. In Tamil Nadu we have all these Technical units except Remount and Veterinary units. The strength of N.C.C. in Tamil Nadu and Pondicherry on the eve of the 24th Anniversary of the N.C.C. is as follows :—

	Boys.	Girls.
(a) Senior Division (Colleges).	31,400	3,000
(b) Junior Division (Schools).	67,000	5,800

The following new unit has been sanctioned and will be raised shortly :—

6 (T.N.) Medical Company at Coimbatore.

Annual Training Camps, Courses and Attachments.

Attendance at Annual Training Camps is an essential and important feature of N.C.C. training and every N.C.C. cadet is required to attend them during his/her service in the N.C.C. Several camps were organised by the various groups in Tamil Nadu and Pondicherry States. In all 22,821 Boys and 2,045 Girls cadets attended Annual Training camps during the training year 1971-72.

In addition to the Annual Training Camps, selected Officers and cadets are sent on various All India Courses and Camps. 111 cadets attended the various Advanced Leadership Rock Climbing and Mountaineering Courses held in the different States. 405 Boys and 210 Girls also attended All India Summer Training Camps held

at Ootacamund, Marve, Bangalore, Yushmani, Pondicherry, Bhowali, Kompally and Pahalagam. All India camps and Courses are generally held at places of historical and tourist interest and cadets are very keen to attend these camps.

Attachment with the Regular Army, Air and Naval bases is another great attraction to the boys. Army boys go on attachment to Regular Army Units in field and peace areas, Naval cadets to I.N. Ships and Air cadets to I.A.F. units for training. The attachment is for a duration of 21 days. 248 Army wing, 7 Air wing and 6 Naval wing Cadets were attached to the various regular service units during May-June 1972.

Shooting competitions.

An Inter-Group Shooting Competition was held at Madukarai, Coimbatore from 23 to 29th October 1972. Three boys and 2 girls teams represented this Directorate in the Inter-University Shooting Competitions held at Allahabad from 9th to 11th January, 1972.

Introduction of Para Trooping.

This year a unique feature was introduced in N.C.C. training. Selected Boys from all over the country were sent to the Para Troopers Training School at Agra for training in Para jumps.

The contingent from this Directorate which went to the Vayu Sena Camp held at Poona from 28th May 1972 to 10th June 1972 won the Vayu Sena Trophy for the Best Air Contingent. In addition, the contingent from (T.N.) Air Sqn. N.C.C. won third place in the competition for the Subrato Art Trophy for Flying, Gliding and Flight security performance.

The National Cadet Corps had played a very useful role in Civil Defence and allied measures during the emergency in 1965 and with the experience gained during that period and knowledge acquired in Civil Defence training, the Cadet Corps once again rose to the occasion and did a splendid job in rendering all possible assistance in the 1971 war effort in co-operation with other Civil Defence authorities.

Nearly one lakh of boys and girls of the N.C.C. voluntarily offered their services and excellent work was done by them specially in those States which bore the brunt of the war. Moving and working in a disciplined manner as a team, the cadets did voluntary work in hospitals assisting the overburdened staff in nursing duties. They manned the telephone exchanges thus relieving the permanent staff for other essential duties. They also carried out look-out, patrol, messenger, black-out and traffic control duties and assisted at the Civil Defence posts set up in various centres. All the duties that the cadets undertook were performed in a disciplined and sincere manner and was appreciated by one and all.

In the task of rehabilitation, the N.C.C. once again made its modest contribution. Regular Service personnel with the N.C.C. cadets were given the task of contacting the families of the Service personnel killed, wounded or missing during the war. Their main task was to make these families aware of the entitlements, benefits and concessions given to them by Central and State Governments, help in filling various forms and despatching them to the correct authorities and bringing to the notice of authorities the problems faced by these families.

Rehabilitation is not an easy task. It requires a sympathetic and understanding approach and it is to the credit of the N.C.C. for undertaking these assignments in a spirit of sincerity, good cheer and devotion to duty.

Captions of Pictures in opposite page.

Inset Left is the first Paratrooper of Tamil Nadu N.C.C. Sgt. A. Mohan Singh.

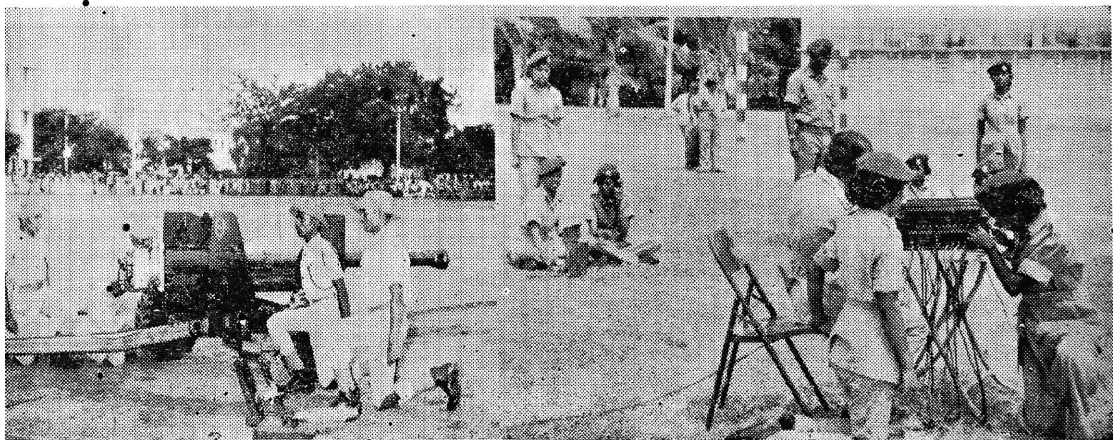
Inset Right is C.W.O. B. Vijayanandran, who represented Tamil Nadu N.C.C. at Annual Air Camp at Singapore.

Top Right show Tamil Nadu N.C.C. cadets getting their trophies from the Prime Minister.

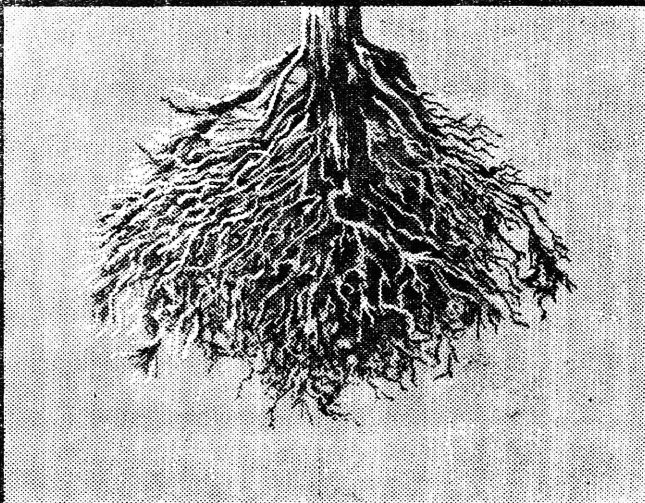
Bottom Left N.C.C. cadets practicing gun drill.

Bottom Right girl cadets operating Field Telephone Exchange.

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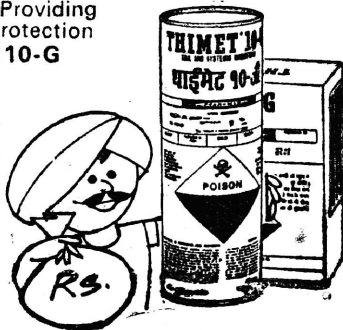
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ASTA'S-CH-88

PERSPECTIVE PLAN FOR FAMILY PLANNING IN TAMIL NADU

(Family Planning Fortnight was celebrated all over Tamil Nadu in the middle of last month, i.e. 11th to 25th December 1972 when public functions were conducted and addressed by the Ministers and individuals of note elucidating and emphasising the importance of the limited family in the present context of the economic growth of our State as well as our country. In this connection the Tamil Arasu feels glad to publish the report of the Task Force of the State Planning Commission on Family Planning as it puts in proper perspective the future policy and programme of the Tamil Nadu Government with regard to the Family Planning aims and aspirations—ED).

Family Planning is a socio-economic necessity. All our efforts and endeavours towards economic growth would be of no avail unless and until the country achieves substantial and significant results in the sphere of family planning. Tamil Nadu has already to its credit the noteworthy achievement of setting the pace and methods to be adopted for achieving these significant achievements.

On the basis of experience gained to date, the Family Planning Programme for the Perspective Plan period 1972—1984 will be developed in terms of the immediate objective, the intermediate objective and the long-term objective. The immediate objectives will include the efforts and performance necessary in terms of resources and activities; the intermediate objectives will comprise the spreading of the knowledge required for the development of favourable attitudes, increasing the number of adopters and providing social and economic support to them and the long-term objectives will comprise the correlation of these measures to bring about the reduction of the birth rate to 25 per 1,000 by 1978—79 and to 22 by 1983—84. The plan proposes a balanced and equal emphasis on clinical methods as well as social and psychological education for the promotion of Family Planning.

The Targets.

Out of 135 effective couples for every 1,000 of the population in the State, 22.4 couples are

currently protected by sterilisation or I.U.C. Ds. or conventional contraceptives. In order to achieve a birth-rate of 25 per thousand by 1979, it is proposed gradually to increase sterilizations from 4.0 to 9.0 per thousand of population; the use of I.U.C.Ds. from 1.4 to 3 per thousand of population; and the use of conventional contraceptives from 1.7 to 15.0 per thousand of population. These targets are to be continuously reviewed in light of actual birth-rates, fertility rates and of the actual performance measured against targets. The overall State targets will also be varied in each district in accordance with the age-groups and preferences of the population of acceptor couples in the district.

Extension Education.

The family planning programme differs from many other action-oriented programmes for social change in that it has to create the demand for the services before they are met. People have not only to be informed and helped to link family planning to their family goals and aspirations but some of the social and cultural factors that inhibit the adoption of the programme have to be overcome simultaneously. The magnitude of the task can be judged from the fact that, while about 12 lakhs sterilizations have been performed upto 1972, about 24 lakhs must be sterilized by 1979, if the goals set are to be realised. Similarly the acceptance of I.U.C.Ds. has to be

stepped up from the present level of 1.4 per thousand to 3 per thousand and the use of condoms from 1.7 to 15 per thousand. To this end family planning is to be made a way of life for most of the people by swaying their minds through the means of education. The operational objectives of education for family planning during the perspective Planning will be in the following lines such as providing detailed information to those who are aware of family planning, about specific contraceptive methods; removing the misconceptions and fears in peoples' minds; helping people further to comprehend the health and other values of family planning and the ways in which it helps to satisfy their needs and wants as a family; developing further within the community a social environments and attitudes in which family planning practices become accepted and are actively advocated; providing for psychological support to adopters in relation to the rest of society, building up the level of knowledge of the programme in the community so that it becomes immune to rumour and misinformation.

The publicity programme will be such as to include the more intensive use of the radio, films, newspapers, magazines, posters, printed materials generally, hoardings, display signs and exhibitions and gramophone records. A consciousness of contemporary social modes and their correctives must permeate the purposive arts which are receptive to and have use for such influences.

Besides these, face-to-face communication will also be followed and it will include the individual approach the small group approach, and the community organization approach. That will entail communication through seminars; strategic groups in the community; informal channels, such as satisfied adopters, the small talk and the informal doctor's briefs at dispensaries, nutrition clinics, immunization centres, etc.

THE STAFFING PATTERN.

The staffing pattern of the family planning programme authority will be revised as follows: One auxiliary nurse-midwife for five thousand of population, a more specific redesignation of the Block Extension Educator as Block Extension Educator (Health, Nutrition and Family Planning); the conversion of the post of Mass Education and Information Officer into that of Chief District Officer for Education and Publicity, the appointment of Assistant District Officers (Education and Publicity) posted at the rate of one for 8 to 10 P.H.Cs., the conversion, at the State level, of the post of Deputy Director (Family Planning and Mass Education) into that of Deputy Director of Education and Publicity assisted by three Assistant Directors, one each for mass media, extension education and the audio-visual wing respectively; the addition of three travelling reporters in the editorial section and eight additional members of staff in the audio-visual wing. Provision is also made for audio-visual equipment and vehicles for the P.H.Cs., district and State Headquarters.

POPULATION EDUCATION AND TRAINING.

The formal school system provides an ideal medium for population education. A very important aspect of this work is the preparation of a curriculum and of teachers to administer that curriculum. This is to be achieved by incorporation of population education as an integral part of all teacher-training programmes at graduate and secondary levels, the training of teachers on population education in batches, the preparation and supply of teaching materials like flash cards, charts, literature, etc., to teacher training institutions and to the schools themselves, a detailed programme to

reach the 'out-of-school youth' through youth clubs, young farmers club, dramatic societies and arts clubs, Mathar Sangams, special youth camps, etc.

The responsibility for planning, implementing and evaluating the programme at the school level will be vested in a Population Education Unit to be established under the State Council of Educational Training and Research.

Teachers under training from the 25 graduates and 150 secondary teacher training institutions will receive a 40 day period of integrated training in family planning population education in addition to public health, nutrition, school health, environmental hygiene and sanitation. This programme will be organised by the State Health Education Bureau which, for this purpose, will be strengthened by the addition of three professional staff. In one of the Universities, a Post-graduate Centre of Population Studies is recommended to be established.

FAMILY PLANNING IN MEDICAL EDUCATION.

A month's internment in a primary health centre will henceforth be compulsory for paramedical health workers' graduation and the award of certification will be conditional upon such apprenticeship or orientation. This rule will apply alike to health visitors, auxiliary nurses, midwives and health inspectors. The primary health centres chosen for internship will offer separate residential accommodation for male and female trainees.

INCENTIVES FOR FAMILY PLANNING.

The incentives programme for the Perspective Plan period will, in addition to those already in force, include the following:

Facilities like allotment of housesites by autonomous town planning bodies secured through the good offices of the State, educational concessions at higher levels of education and loans for various purposes, so that those who limit family size in effect get preferential treatment.

Free medical and health care for sterilized persons and their families

through a system of health cards for a period of two years after "adoption".

Preferential treatment under old-age pension schemes for elderly parents with two or three children who belong to economically handicapped groups and who voluntarily limit their families under the Programme.

Institutional care for the eligible fathers following the sterilization operation for six days in health resorts or secondary health care institutions.

The present system of payment of Rs. 10 to all promoters to be continued for Government workers.

The performance in family planning be made a criterion for confirmation in Government service, promotion and selection for higher training; outstanding workers be given advance increments, merit certificates, prizes, etc.

Institutions like primary health centres/blocks be given prizes for outstanding performance in team work.

Any village that reports sterilization up to a fixed percentage of eligible couples should be given a community incentive in the form of a cash payment.

Tax concessions for persons with small families and for unmarried adults.

INVOLVEMENT OF OTHER DEPARTMENTS.

To spread the idea of family planning among the people and to give the programme as wide publicity as possible not only among those who are remote from such concerns of the State but others easily accessible to motivation education under the programme, it is thus necessary to enlist the support of the district staff of other State Government departments such as women's welfare, agriculture, labour etc. Group Leaders, arbiters of social and religious opinion, and members of Parliament and State Assemblies should also be involved. Their concurrence and active support will promote wider acceptance of the programme.

ACTION BY SPECIAL ORGANISED GROUPS.

The implementation of the family planning programme will involve and include the following organised sectors :

To bring about the harmonious and co-ordinated participation in the programme, each industry, plantation, business house, public and private undertaking will constitute a Health, Welfare and Family Planning Committee, which will plan and implement the family planning programmes as worked out for each establishment with available resources and under the guidance of the State Family Planning Bureau.

The Committee will consist of the representatives of (1) top management, (2) the unions and (3) the workers and co-opt the personnel and medical officers of the establishment.

Each industry will be encouraged to develop an unit-wise strategy of work. The employers can, in consultation with the employees, develop various types of incentives suited to their special conditions. The examples of several industries, which have participated successfully in the fulfilment of the programme may be followed for guidance.

In the workers' education programme which comes under the purview of the Labour Department, Health and Family Planning should be introduced as a subject of popular instruction so that the workers get a comprehensive knowledge of the population problems of the country, the contribution of the family planning programme to the solution of these problems and their role in it.

EVALUATION TASKS.

The evaluation task will focus on the purposive assessment of the impact of the programme, the identification of areas of success and failure, or the reasons thereof and the feeding back of this information for the modification and improvement of the programme and its implementation.

Setting up annual and district and block targets and determining the method-mix for reaching the goal of the required reduction of births ;

Developing systems and procedures for collecting service statistics ;

Analysis of data received from the field and the transmission of the results to senior programme staff for evolving follow-up action.

Improvement of the quality and reliability of data through periodical field visits and spot-checking.

Review of progress reports and multiple organizational depth studies based on "returns" filed by adopters for determining factors making for differences in performance between areas and population groups.

Determination of the effectiveness of extension work and the staff engaged in the work.

Co-ordination of and participation in developing action-oriented research projects e.g., study of the cost effectiveness of different schemes ; predictions in terms of births prevented ; liaison with primary research organisation and dissemination of important findings of research studies and experience gained.

DEMONSTRATION PROJECTS.

The following demonstration projects are designed to expand the capacity of the existing family planning units to provide medical or motivational services both quantitatively and qualitatively :—

(i) Abortion-counselling service.

(ii) Upgrading the training skills of the trainers.

(iii) The greater involvement of panchayats.

(iv) The greater involvement of Government employees.

(v) The appointment of non-medical administrators for primary health centres.

(vi) Intensive work in high-diffusion potential villages.

(vii) Project to improve integration of the health and family planning services and their combined performance.

(viii) Experiments in variation of work-patterns for health inspectors (family planning) block extension educators, etc.

INTEGRATION AND CO-ORDINATION.

An integrated administrative service for Health, Family Planning and Nutrition, which includes maternal and child care as well, will have the following aims :—

To provide a complete, continuous and comprehensive service for the mother and child in the first instance and later, for the entire family as part of a larger community health Service.

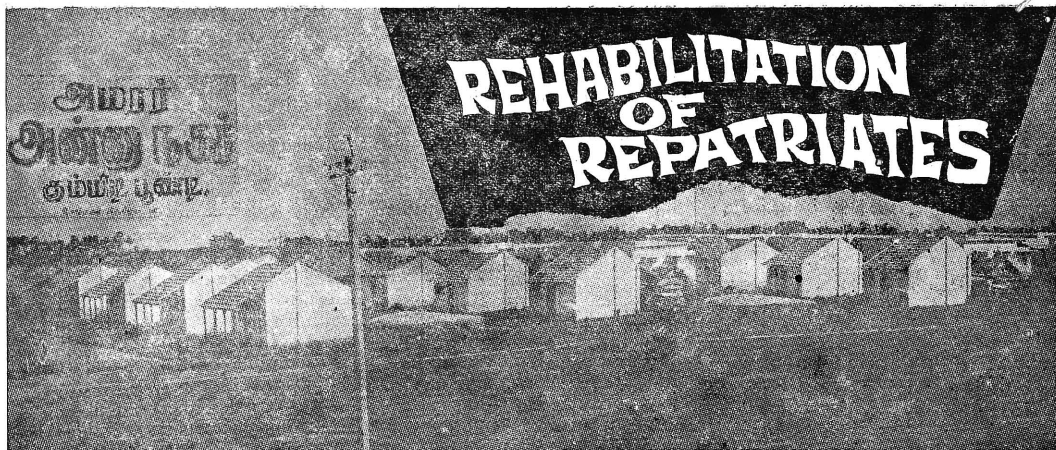
Responsibility for this should not be divided as between several agencies, so that the need to refer cases from one agency to another is minimized and the mother and child get quick attention for their ailments and needs under a single roof.

To provide for groups of workers at all levels so as to achieve the objective as stated above. (Family Planning advice has been found to be more acceptable when it comes from maternal and child health workers).

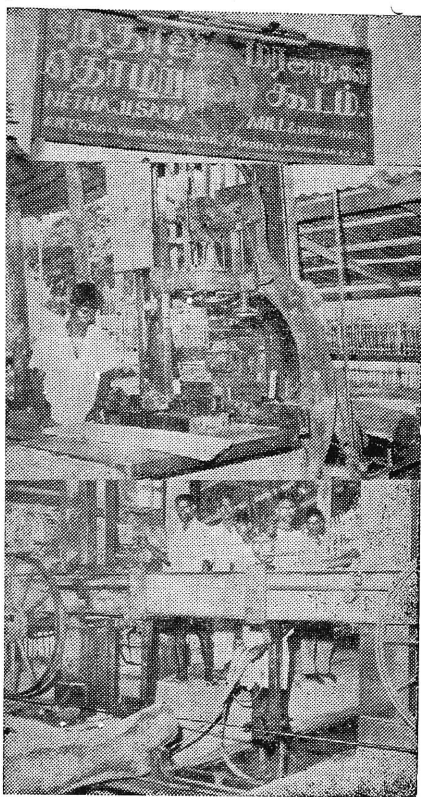
To provide common financial resources thereby exercising a measure of economy.

About 40 per cent of total deaths occur among children below five years. A vicious cycle-large family size malnutrition-poor maternal care-high child-mortality motivation for larger families resulting in the aggravation of malnutrition is established. Family planning and Nutrition programmes should, therefore, go hand in hand for the success of other health schemes. Family planning schemes will be readily accepted if they are provided as part of the general health services, especially along with maternal and child health services. Since mothers of poor nutritional status can also be the cause of nutritional deficiency in their children, nutrition should also be integrated with the general health services.

The Small
Family makes
A Strong Nation.



Housing Colony at ANNA NAGAR, Gummidipoondi.



Nethaji Saw Mills and Industries at PADIYALLUR run by Burma repatriates with the financial assistance of the Government.

A SACRED TASK OF TAMIL NADU GOVERNMENT

Owing to the nationalisation of various sectors of the Burmese economy and the agreement concluded between the Government of India and the Government of Ceylon, a large number of Indian Nationals who had been residing for a long period in these countries have been repatriated to India.

From Burma alone 1,20,612 persons have already returned and it is estimated that the total number of repatriates may go upto two lakhs. From Ceylon, about 5,25,000 persons of Indian origin would be returning to India over a period of 15 years about which a lakh of repatriates would come within a period of two years beginning from the year 1971. So far 65,859 repatriates have arrived. Evidently the problem of rehabilitation of repatriates from Burma and Ceylon is big in magnitude and call for a speedy and determined effort.

For tackling the problem of rehabilitation of repatriates from Burma and Ceylon for the entire States of Tamil Nadu and Andhra Pradesh Employment Liaison Offices were set up at Madras and Visagapatnam. In Tamil Nadu Employment Liaison Office under the charge of an Assistant Director and under the administrative control of Director of Employment and Training started functioning with effect from 22nd August 1966. Main functions of the 'Employment Liaison Office' unit are to tackle the problem of rehabilitation of repatriates for the

entire State of Tamil Nadu, to maintain close liaison with important employers of the State for canvassing vacancies and to organise and co-ordinate the activities of Employment Exchanges to ensure early placement of repatriates in suitable jobs.

Employment opportunity.

Total number of 18,490 Burma Repatriates and 5,604 Ceylon repatriates have approached for employment and out of them 1,823 Burma repatriates and 496 Ceylon repatriates have actually been provided with employment from the year 1966 till February 1972. A total number of 1,826 repatriates from Burma and 3,192 repatriates from Ceylon remained on the Live Register of Employment Exchanges at the end of February 1972. Priority has been accorded to them for appointment under Central/State Government through Employment Exchange. In order to provide necessary reception arrangements to repatriates arriving from Ceylon, Government have accorded sanction to set up a Sub-Employment Office each at Mandapam and Tuticorin under the charge of a Junior Employment Officer.

Sub-Employment Office at Mandapam started functioning with effect from 5th January 1971 exclusively for Ceylon repatriates arriving at Rameswaram port. So far 1,607 repatriates have sought for the help of this office.

TRAINING REPATRIATES

TO FIT THEM FOR NEW JOBS

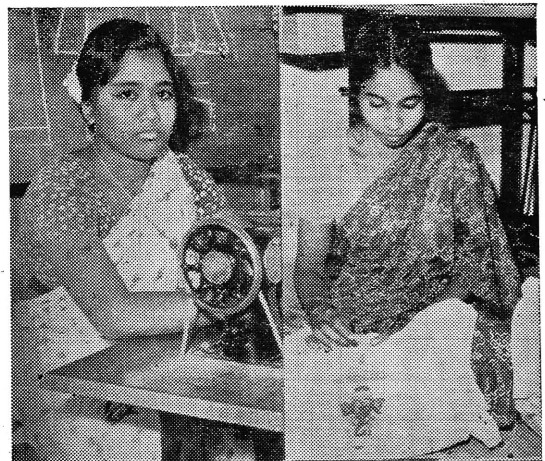
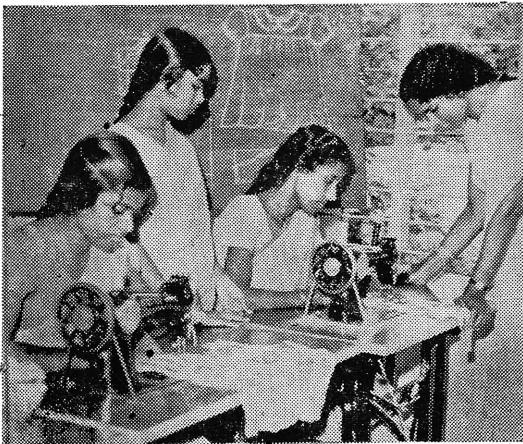
Training facilities.

In order to provide speedy rehabilitation of repatriates, various training facilities have been extended to them. Government of Tamil Nadu have reserved 5 per cent of seats in Industrial Training Institutes in Tamil Nadu. While on training, they are entitled for a stipend of Rs. 55 per mensem in the case of those residing in the hostel and Rs. 15 per mensem in the case of repatriates residing with their parents. From the year 1966 to 1972, 308 repatriates from Burma and Ceylon have undergone training in the Industrial Training Institutes, Tamil Nadu.

Government of India is running a Technical Training Centre at Mana (MP) exclusively for training repatriates from Burma/Ceylon and East Pakistan Migrants on various trades and by that make them to have more avenues of employment opportunities and provide them facilities for self-employment.

Deputing repatriates from this State to this Institute started with effect from April 1969 and as on date 359 repatriates have been trained successfully through this institute. At present 180 repatriates are undergoing training in this Institute.

Central Water and Power Commission, Government of India, New Delhi is running Technical Training Centres at Kota (Rajasthan), Nungal (Punjab) to train repatriates in Heavy Earth Moving



Repatriate women under training at TAILORING CENTRE, Mondiamman Nagar near Gummidipoondi, Chingleput district.
Here repatriate women are given training in Tailoring, Embroidery and Needle work.

Equipment. So far 12 repatriates at Technical Training Centre, Nangal and 17 repatriates at Technical Training Centre, Kota were trained in these training centres. Before they were sent for one year training, they were given preliminary training for three months at Neyveli Lignite Corporation. At present 10 repatriates have been undergoing training at Technical Training Centre, Kota and the course was started on 15th September 1971.

The Tractor Training and Testing Station, Budni (MP) and Hissar are conducting a training course in Farm Machinery utilisation and Tractor Mechanism for three months. Five seats in each institute for each course are reserved for this Department in Tamil Nadu. So far 10 repatriates were trained in the year 1970-71 and at present four more candidates are undergoing training in this Institute.

Training-cum-employment schemes.

Madan Industries Spinning Mills, Hastinapur came forward to offer various job opportunities for repatriates from Burma and Ceylon. So far 166 repatriates have been sent for Madan Industries, Hastinapur.

Co-operative Spinning Mills at Karim Nagar, Nazareth, Srivilliputhur and Nellore have come forward to employ repatriates provided they have the job experience in spinning and weaving.

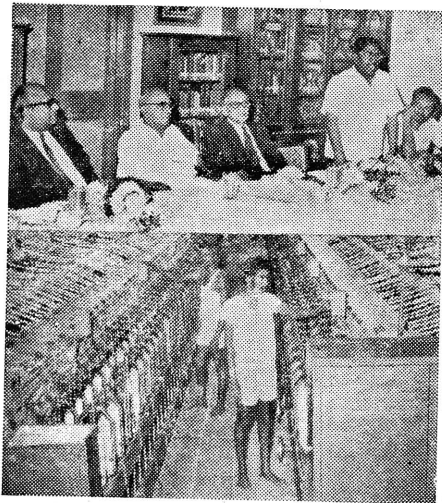
The Director of Employment is often meeting employers of repatriates.

GENEROUS SUPPORT FROM EMPLOYERS FOR REPATRIATES

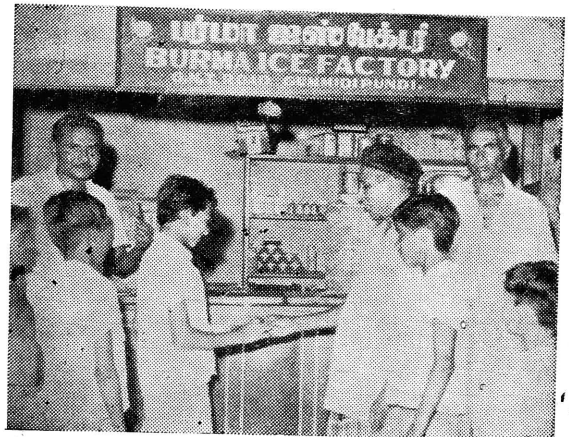
During the year 1970, 60 repatriates were despatched to Anthergaon Spinning Mills, Ramagundam after three months preliminary training in Tamil Nadu spinning Mills. As per recent agreement reached between the Managing Director, Tiruchendur Co-operative Spinning Mills, Nasareth and Government of India, it was decided to employ 50 repatriates in the Co-operative Spinning Mills. Action is being taken to despatch the repatriates to this Spinning Mills.

Recently Government of India and Government of Tamil Nadu have accorded sanction of various schemes such as training 50 repatriates in Boiler Attendant trade, training in Cookery, food canning and preservation, waiters under the Institute of Catering Technology, training in short-term course in Concrete Technology at Cement Service Bureau, Madras-18, etc.

The main idea of providing such kind of training facilities to repatriates from Burma and Ceylon is to shape the repatriates who are only fit for unskilled jobs as technically qualified craftsmen so that they could be well settled in the industries as technical persons though not all could engage themselves in self employment. In order to provide speedy rehabilitation of repatriates, the problems, which are increasing day by day, should be approached by all concerned with a humanitarian touch.



Repatriate trainees at work in the Tiruchendur Co-operative Spinning Mills.



Burma Ice Factory at Gummudipoondi run by Burma repatriates with the assistance of the Government.

A BIG TREASURE HUNT!

The Fisheries of Tamil Nadu

Tamil Nadu has a coastline of 1,000 kms. and a continental shelf of 35,000 sq. kms. She has an inland water-spread of 3.51 lakh hectares of culturable water. Tamil Nadu is thus endowed with rich natural potential in both the marine and the inland area for development.

Tamil Nadu has not been lagging behind in efforts to tap these rich resources.

Fish Production

The fish production of Tamil Nadu increased from 1.2 lakh tons in 1950 to 2.79 lakh tons in 1970. Marine fish production increased from 0.86 lakh tons to 1.5 lakh tons and the inland fish production from 0.34 lakh tons to 1.20 lakh tons during the same period. Tamil Nadu is second only to Kerala in marine fish production and is also second only to West Bengal in inland fish production. She contributes about 16 per cent to India's total fish production. This contribution is valued at Rs. 25.18 crores at current prices.

The Fisheries Department of Tamil Nadu, one of the oldest in the country, is the main administrative organisation responsible for developing the marine and inland fish potential of Tamil Nadu.

Marine Fisheries

In Tamil Nadu, there are about 300,000 fishermen of whom about 100,000 are actively engaged in marine fisheries. Living in more than 300 fishing hamlets all along the coastline, they use traditional fishing crafts, like the catamarans (about 25,000 in number) and canoes (about 5,000 in number) and various types of fishing nets. About 50 per cent of the marine catches are disposed off locally in fresh condition; 35 per cent either sun dried or salted; and the balance frozen, canned or converted into fish-meal which is a recent development.

At the village level primary co-operatives exist, marketing unions for a group of societies and District Federations also help in disbursing short, medium and long-term loans to fishermen for various purposes.

Fishery Development

The major objective of marine fisheries development consisted of mechanising the fishing operations, by the provision of mechanised vessels, use of modern gear and gear materials, creation of infra-structure facilities for landing and berthing, transport, processing and freezing. The Fisheries Department began to take energetic steps to develop marine fisheries in the above-mentioned areas starting from the Second Five-Year



Plan. To organise marine fishing on sound, modern and industrial lines was not an easy task, since there was reluctance on the part of the private entrepreneurs to take to fisheries and there was reluctance on the part of the traditional fishermen to improve their economic prospects owing to various reasons. The Fisheries Department had to surmount these initial obstacles.

Besides, our knowledge of the availability of various fishery resources in the inshore, offshore and deep sea was meagre. Hence systematic survey and exploration had to be conducted. An assessment of the landing and berthing facilities at various points along the coast had to be made. Modern fishing having become an organised industry, the State needed well-trained technicians for various jobs in the fields of processing, freezing, gear technology, servicing and maintaining of mechanised vessels, plying of mechanised vessels with sophisticated equipment, etc. These requirements were met one after another.

The Department established four Inshore Fishery Survey Stations at Madras, Cuddalore, Rameswaram and Cape Comorin. These stations did valuable work in locating the fishing grounds for shrimp, lobster, silver bellies and cat-fish. The survey stations did good work in introducing improved fishing gear for commercial use. Two steel trawlers, 17.5 Mts. long were required for intensifying offshore survey work, in order to supplement the efforts of the offshore, stations of the Government of India set up at Tuticorin and Madras.

The Department set up 4 boat-building yards, two at Madras, one at Nagapattinam and one at Mandapam. A new boat-building yard for constructing ferro-cement boats has also been sanctioned. These boat-building yards built boats of varying lengths ranging from 30' boats to 50' boats. A 38' ferro-cement boat has been constructed for the first time in one of the yards. The Department has constructed and distributed so far 841 number of mechanised vessels till the beginning of the Fourth Plan.

CO-OPERATIVES FOR BOAT BUILDINGS

An interesting development in this connection is the growth of co-operatives and private enterprises for boat building. A few well organised private boat-building yards have been set up recently. Assisted by

▲ Boat building yard (Right) prawns shelling for export.

the Agricultural Refinance Corporation two of our Co-operative Federations have also taken to boat-building for distribution to their members. More co-operative and private involvement in boat-building is expected in the near future.

Another significant trend is the interest increasingly evinced by private entrepreneurs in modern fishing industry. To aid and stimulate them, the Government have recently sanctioned a loan scheme for private entrepreneurs under which 20 per cent of cost will be given as interest-free advance by the State Government to private entrepreneurs, the balance being met by the Commercial Banks and from their own resources.

MODERNISING TRADITIONAL CRAFTS

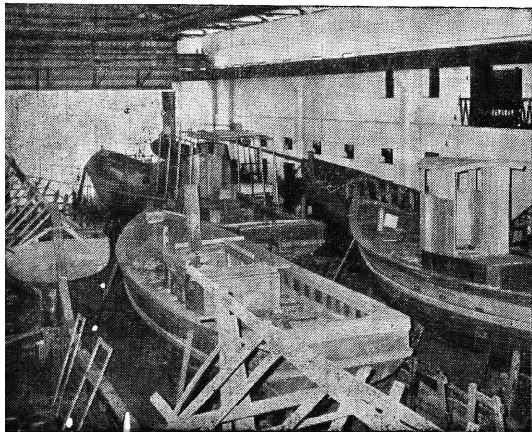
This Department has distributed nylon yarn for improved gear on a large scale to the traditional fishermen and to the mechanised vessels during the last 10 years.

This Department has been striving to encourage an intermediate technology for the traditional craft like the catamarans and canoes. An experiment for fitting the catamarans with out-board motors is in progress in Kanyakumari district, with help from Belgium under the Freedom from Hunger Campaign. This Department has been fitting up canoes with in-board motors in selected areas of the coast. Supply of insulated boxes and brine tubs have been contemplated.

During the Fourth Five-Year Plan, the Department has targetted for distribution of 1,275 mechanised vessels. In the Fifth Plan about 1,100 mechanised vessels will be built and distributed. Modern technological improvements in boat building will be adopted and followed. Larger sized vessels will be built for exploitation of the offshore and deep sea.

CREATION OF FACILITIES

Simultaneously the creation of such infra-structure facilities like landing and berthing places, provision of ice-plants, cold storage facilities, plate freezers and frozen storage is in progress. Good landing facilities now exist at Cuddalore, Nagapattinam, Tuticorin and Colachel. Landing centres like Ennore, Pulicat,



Mallipattinam, Muttom, Kulasekarapattinam, and Point Calimere will be improved. A number of ice plants, cold storages exist all along the coast-line. Private entrepreneurs have evinced keen interest for the development of similar facilities and a number of plants are being set up in recent time in the private sector.

Though most of the valuable prawn catches are now going to the West Coast for processing and export in recent times, increasing quantities are being processed and exported from Tamil Nadu itself. The Department will promote all such activities to maintain this trend.

As a result of the above activities, marine fish production is expected to reach 5 lakh tons by the end of the Fifth Five-Year Plan and 9.5 lakh tons by the end of Sixth Five-Year Plan.

INLAND FISHERIES

The main objective in this field relates to the intensification of fish seed production and stocking of all major inland water spreads, as well as restocking because of the seasonal character of many water sources.

The current annual level of fish seed production in Tamil Nadu is 56 millions; 42.5 millions have been collected from natural sources and 13.5 millions have been bred in the Departmental induced carp spawning centres.

There are 9 Induced Carp Spawning Centres in the State which have done valuable work.

Our annual requirements of fish seed amount to about 100 millions. To meet this need, the Department has proposed to expand the existing Induced Carp Spawning Centres and open new centres.

As a result, the inland fish production is expected to reach 3 lakh tons by 1984.

Tamil Nadu has been pioneer in the development and maintenance of reservoir fisheries. The current production from 28 reservoirs is more than 700 tons per year which will reach 2,500 tons by 1984. This is to intensify stocking and adoption of improved gear for fishing.

The development of trout will engage the Department's attention in the Nilgiris and Palani hills.

RESEARCH

Tamil Nadu has pioneered Fisheries Research. Well-organised Fisheries research stations exist to study problems relating to Marine Fisheries Biology, Fresh Water Biology, Hydro Biology and Fisheries Technology. Currently, an ICAR Research Project on the utilisation of trash fish is underway. Two inland fisheries research projects on Ecology in reservoir fisheries and composite fish culture have also been sponsored by the ICAR at Bhavanisagar. A proposal for pearl culture, sponsored by ICAR is under consideration.

A State Level Fisheries Research Council reviews and supervises the research work of the Department. The Madras Journal of Fisheries is published by the Department. A News letter of the Department periodically carries valuable information on Fisheries Research and Development to all the staff and officers of the Department. An ICAR sponsored project for "Mariculture" is under contemplation.*

the living past

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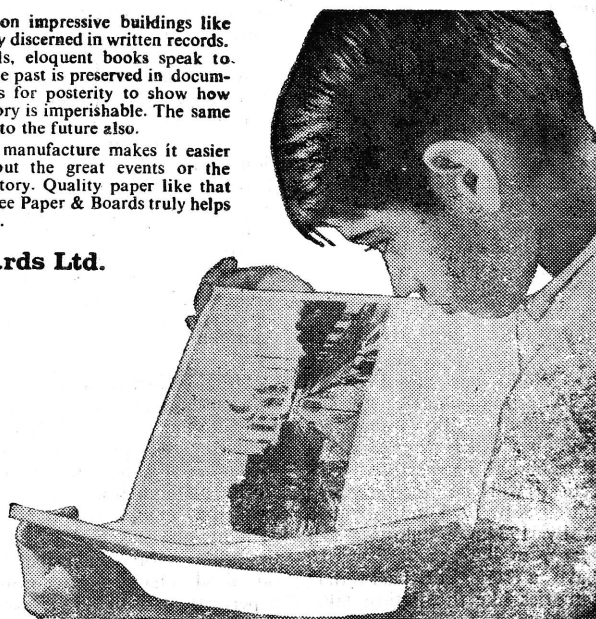
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MARICULTURE OFFERS PROMISES FOR INCREASED FISH PRODUCTION

Address delivered by Thirumathi, M. Sathyavanimuthu, Minister for Harijan Welfare and Fisheries on the inauguration of the Seminar on Mariculture and Mechanised Fishing on the 28th November 1972 at Madras.

Both Mariculture and Mechanised Fishing are techniques to increase fish production. No one will deny the need to rapidly increase the fish output to feed the growing population of our country. In the context of a very low consumption of proteins by the majority of the Indian population, so vital to healthy living, every increase in fish output is not only desirable, but is necessary. Maricultural techniques and Mechanised fishing methods assume tremendous significance in the context of providing nutritious food to the rapidly growing population of our nation.

Growing interest in Mariculture

Interest in Maricultural techniques grow following experience of Japan in obtaining significant yields in fish production. Right from early times, the Fisheries Department of Tamil Nadu did good work in this direction. Pioneering work with regard to the migratory Hilsa fish, during the first decade of this century acclimatization, culture and popularisation of the pearl spot, Chanos, mullets and other estuarine species were successfully attempted in Tamil Nadu in the early thirties.

Tamil Nadu has about 46-750 hectares of estuaries and backwaters yielding about 3,200 tonnes of fish annually, which works out to a yield of 68 kgs. per hectare. This production will be increased to 15,000 tonnes by 1974 and to 25,000 tonnes by 1984 by culturing fish crustaceans, molluscs and seaweeds. We have a series of backwaters and estuaries like the Pulicat lake,

Ennore backwaters, Adyar back waters, Vellar estuary, Palar, Marakanam, Kovalam, Killai and Coleeroon estuaries, where Mariculture can be practiced. Studies by the State Fisheries Department and Central Inland Fisheries Research Institute have indicated possibilities for culturing Peraied species.

Fifth Plan aim

During the V Plan we have proposed an expenditure of Rs. 50 lakhs on Mariculture. During the VI Plan this expenditure will be stepped up to Rs. 200 lakhs. Thus Tamil Nadu will soon be launching on a major programme of Maricultural operations.

Ambition apart, there is no doubt that a programme on this order can be put through only after careful study of all the implications of Maricultural farming. Though many other countries have successfully adopted Maricultural techniques and have bred fishes of various species, Indian experience in this regard is somewhat limited, calling for more intensive research and experiments of all aspects of Mariculture.

The principal requisites for sound Mariculture are the location of the ground for seed collection. Induced seed production, rearing of larvae stocking and manuring, stock manipulation, etc. It also calls for analysis of the ecology of individual species and communities and more intensive studies on food changes. According to experts there is a large surplus of

basic food in the estuary and we have to convert this into edible protein. In the Tamil Nadu coast there is a dense Fauna of species in estuaries and backwaters. These have to be studied, so that manipulative measures can be designed. Culture of prawns, Mulletts and chanos can be adopted to increase the yields as in Israel. The common carp can also be tried for culture in brackish waters. Mussel yield of 4,000 kgs. per hectare is now being obtained on the West Coast of India. Similar yield can be aimed at on the East Coast also. Israel has achieved notable success in the Induced breeding of mullets. Similarly Induced breeding techniques can be attempted in the case of other salt tolerant fishes. More research is called for on the rearing of larvae which is the Achilles heel of estuarine fish farming. The nature and the extent of control of environmental factors should be carefully studied so as to obtain the best possible food chain.

At the same time, there is no doubt that Mariculture offers promise as one of the best techniques for increasing the fish production of our country. However, there are serious dangers to estuarine development in the construction of dams and barrages and the pollution of estuarine areas. The Seminar may devote attention to these two dangers and suggest remedial measures.

I now come to the second major subject of the Seminar, viz., Mechanisation of fishing. The world production of marine fish has been increasing by about 7 per cent per

annum. The Indian rate of growth is about 6.2 per cent. The rate of growth so far as Tamil Nadu is concerned is about 5 per cent. Though India occupies the 7th place among the nations in the world. In Marine and Inland fish production, our share in the total world production is very low. With a vast coast line, the country offer almost unlimited opportunity for exploitation of marine fishes. The traditional fish craft and gear are now being replaced by mechanised vessels and improved gears. But the pace is not enough and needs to be quickened. Mechanised vessels all along the coast line operate mostly in the inshore belt, there is very little exploitation of the offshore belt. The deep sea is practically unexploited. The existence of the vast fishery potential in both Arabian coast and the Bay of Bengal is well known. Measures have, therefore to be adopted rapidly for increasing the exploitation of the marine fish. Our own knowledge of the existence of the various types and resources in the offshore and deep sea is quite limited. Intensive survey and exploratory work has to be carried on to gain better knowledge of the fishery resources and fishing conditions of the offshore and deep sea.

Efforts towards the mechanisation of fishing have been undertaken in Tamil Nadu for some time. During the Second Plan period, 82 mechanised boats were introduced. During the Third Plan period 374 mechanised vessels were newly introduced. In the Fourth Plan period over 1,000 mechanised vessels would have been introduced but most of these vessels are small vessels of the range of 30' and 32'. Large sized vessels have to be put into operation so that the deep

seas can be exploited. Out of 4-12 lakhs of square kms. of continental shelf only 1.81 lakhs of square kms. now being exploited and rational utilisation of the pelagic and demersal fishery over the inner coast of our country is called for.

Introduction of larger vessels would mean strengthening the infrastructure along the coast line including the provision of harbour and berthing facilities. Processing and freezing facilities have to be increased. Training requirements have to be met so that technicians of various kinds can be brought out in a large number to man the vessels plants and to engage in modern techniques of fishing operations. Servicing facilities for mechanised vessels have to be provided all along the coastal line. The provision of all these infrastructure facilities mean the investment of a large order. There is no doubt that the investment of this order can only be undertaken by both State and Centre jointly.

Marketing of marine fish is perhaps the weakest link in the whole chain. Problems of marketing have to be studied in great detail and improvements suggested so that, the actual fishermen can get good price for their catches and marine fish can be rapidly moved into the inland for catering to a large fish eating population in the inland.

Mechanisation also involves improving the boat building technology, use of materials other than wood and steel will have to be studied. Prospects of ferro cement boat building are bright and the extent to which ferro cement could be utilised has to be examined. The Tamil Nadu Fisheries Department has launched

the first 38' ferro cement boat and has plans to build more number of such vessels. Since, copper is becoming scare and costly, a suitable sheathing material has to be tried.

No amount of mechanisation of fishing will completely replace the traditional fishing vessels and fishing gear. Steps have to be undertaken to improve the fishing of the traditional fishermen. The need for some kind of intermediate technology like fitting up of outboard and inboard motors to the traditional vessels have to be analysed.

Fishing gear is an important item in mechanised fishing. It should be our major objective to improve fishing gear even in respect of traditional fishing.

There is, thus a vast area to be studied in respect of mechanisation of fishing. Rapid mechanisation in fishing brings about social consequences. Quite often, the traditional fishermen are loath to change the habits and resent the introduction of larger sized and more powered mechanised vessels. Apart from sentimental objections there is genuine fear about over exploitation by the mechanised vessels. Conflicts arise between traditional fishermen and mechanised fishermen. Conflicts arise also between mechanised vessels owners who are traditional fishermen and those who belong to the non-fishermen entrepreneurs class. Such conflicts indicate the existence of social tension owing to the introduction of new methods and new technology. While such tensions may be common, their impact must be minimised. The process of mechanisation should be carefully regulated. The area of social tension in respect of such is also well worth a study. ●

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INDIAN OIL RECORDS PHENOMENAL PROFITS

The turnover and profitability of the Corporation touched a new high during the year 1971-72. This was disclosed by Thiru M. Rama Brahman, Chairman of the Indian Oil Corporation at the annual general meeting of the Company.

Indian Oil had a sales turnover of Rs. 862 crores during the year as against Rs. 720 crores during the previous year. The total profits during the year before providing for depreciation and interest, were Rs. 53.42 crores, as against Rs. 31.32 crores in the previous year. After providing for depreciation and interest, the profits amounts to Rs. 36.94 crores during the year, as against Rs. 15.77 crores in the previous year. A provision of Rs. 5 crores has been made for tax payment.

Thiru Rama Brahman said that the increase in profits during the year has been phenomenal. He observed that last year the profitability had shown some decrease due to some extraneous factors. The Union Government has now allowed the oil industry to reimburse to itself (through the medium of surcharge on the price) the under recoveries on sales-tax.

During the year, Indian Oil's three refineries at Gauhati, Barauni and Jawaharnagar (Gujarat) processed a total quantity of 6.72 million tonnes of Curde Oil as against 6.34 million tonnes in the previous year and the Gujarat Refinery is now gearing itself to increase the through output to 5.5 million tonnes.

The Barauni Refinery in Bihar is scheduled to be expanded from the present capacity of 2.28 million tonnes to 3.4 million tonnes per year by 1975. The additional crude oil, over and above what is available from Assam, will be imported into India and transported through the Haldia-Barauni Pipeline.

The Chairman disclosed that Rs. 67.5 crore Haldia Refinery now under construction, is being financed substantially out of the Corporation's own internal resources.

Further, it is said that it has been decided to build a new six-million tonnes refinery near Mathura in Uttar Pradesh. A 1,200 kilometre pipeline, from the West Coast to Mathura is to be laid for

transporting imported Crude Oil. The project is estimated to cost more than Rs. 160 crores besides the cost of town ship and other facilities.

The Gauhati-Siliguri, Barauni-Kanpur, Barauni-Haldia and Koyali-Ahmedabad pipelines transported 3.23 million tonnes of products during 1971-72 as against 2.62 million tonnes in the previous year.

The sale of products during 1971-72, rose to 13.68 million kilolitres from 11.61 million kilolitres in the previous year increasing the market participation from 51.6 per cent to 54.2 per cent.

At the end of the year, the Marketing Division of the Corporation had 16 Port Installations, eight Pipeline Installations and one inland Installation besides 117 bulk storage depots.

The number of Indian Oil retail outlets at the end of the year stood at 3,154. During 1972-73, the Corporation has planned to commission another 200 to 250 retail outlets.

The sale of "INDANE" (Cooking Gas) has increased by 56 per cent over the previous year. Indane was made available in 38 additional towns.

During the year, Indian Oil successfully met the challenge of maintaining supplies under difficult conditions during the recent war.

Indian Oil rushed petroleum products to Bangala Dosh after its emergence as a free nation. The Corporation also had the opportunity of arranging import of Crude Oil for the Chittagong Refinery in Bangala Dosh.

Indian Oil was the first in the country to introduce a comprehensive scheme of dealerships for rehabilitating war-widows and disabled jawans after the Indo-Pakistan conflict.

A new field of activity which the Corporation entered during the year was in extending technical collaboration to the neighbouring countries. At the request of Ceylon Petroleum Corporation, Indian Oil Engineers had been deputed to help in the operation of their refinery and training of their personnel.

NEWS IN BRIEF.

Petroleum Industry

.....There were nearly 60,000 persons directly engaged in various sectors of the petroleum industry in the country on April 1, 1972. The total direct employment in different sectors of the petroleum industry increased from 57,998 as on April 1, 1968 to the present level, registering an increase of 3 per cent. But as compared to the number of persons engaged on April 1, 1971, the 1972 figure showed only a marginal increase of 0.3 per cent.

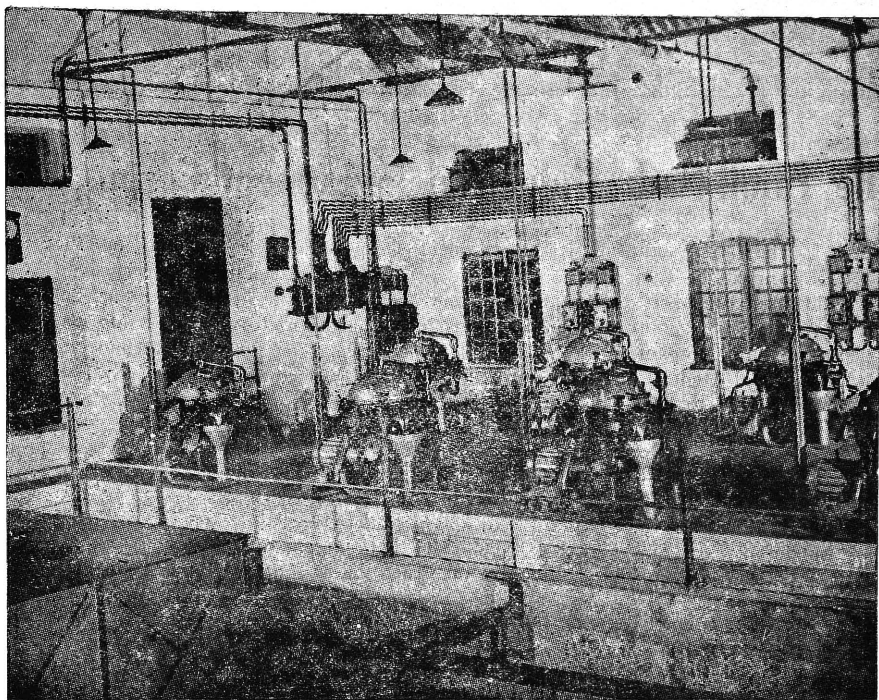
.....In the past 100 years the oil industry produced 30,000 million tonnes of crude oil and in the next 10 years alone, as much quantity will be required to meet world demand. There are enormous crude reserves waiting to be exploited and new fields are constantly being discovered. Viewed in the context of world petroleum production or consumption, India has a long way to go. However, from a meagre 2 million tonnes of consumption in 1947, the figure rose to 8 million tonnes in 1961, 13 million tonnes in 1966, 20 million tonnes currently and will rise to 46 million tonnes in 1980. Production within the country rose from 0.2 million tonnes in 1947 to 7 million tonnes currently and will rise to not less than 13 million tonnes in 1980.

A New Metal Powder

....A process for the production of extra-fine non-ferrous metal powders has been developed by the National Metallurgical Laboratory, Jamshedpur. The metals include aluminium, copper, lead, tin and zinc; and fineness can be obtained up to 325 (44 micron) mesh sizes and beyond.

Tamil Nadu First in Abortion

....Since April 1 to July 31, 1972, a total of 4,068 abortions have been performed in the 357 licensed clinics throughout the country. State-wise, Tamil Nadu and Maharashtra take the lead with 1,103 and 1,102 terminations respectively. Delhi is next with 565, followed by West Bengal with 417 and Andhra Pradesh and Madhya Pradesh with 228 each. The figure of abortions performed in the country has shown a steady increase. As against 710 terminations in April, 1,268 were performed in July 1972.



In the last three years ending 30th September 1972, the Cinchona Department of the Tamil Nadu Government earned a foreign exchange of Rs. 85.95 lakhs by the export of Quinine and Quinidine. Quinine, as is well known, is a sovereign remedy for Malaria, and it has been established recently that while most of the strains of parasites that cause malaria have developed stubborn resistance to many synthetic anti-malarials, they continue to react of Quinine. As a result, there is increasing demand from many countries of the world for Quinine.

Quinine is obtained from the bark of the tree known as the Cinchona tree. It is native of the Andes Mountains of South America and was introduced into India for the first time on the Nilgiris in 1859-60. From the Nilgiris, the plantations extended to the Anamallais in Pollachi taluk.

Quinidine is another alkaloid found in the Cinchona bark and is used in the treatment of certain heart ailments and is also used extensively in India and in many foreign countries.

FOREIGN MARKETS ASK FOR TAMIL NADU QUININE

BY
K. DORASWAMY

The Tamil Nadu Government has at present 2301 ha. (5,686 acres) of Cinchona Plantations on the Ana-

mallais and on the Nilgiris, and also a modern fully equipped factory on the Anamallais for the extraction of Quinine and Quinidine from the bark. The bye-product in the manufacture of Quinine from the bark is what is known as Cinchona Febrifuge. It contains about 10 per cent of Quinine and about 5 per cent of Quinidine. Cinchona Febrifuge had been used for over a century as a prophylactic against malaria, but because of the fall in incidence of malaria, this drug does not find any considerable use at present. Hitherto the Tamil Nadu Cinchona Department used to export Febrifuge to foreign countries at a low price for further processing, but recently, the Chemists of the Department have been able to extract therefrom the residual Quinine and Quinidine, resulting thereby in higher realisation by sale. At present Quinine Sulphate is sold at Rs. 250 per kg. and Hydrochloride at Rs. 263 per kilogram for consumers within India, while the export prices at present are Rs. 468 for Sulphate and Rs. 485 per kilogram for Hydrochloride. Quinidine Sulphate fetches about Rs. 775 per kilogram in foreign markets.*

The Tamil Nadu Industrial Investment Corpn., Ltd.

The Tamil Nadu Industrial Investment Corporation is sponsored by the Government of Tamil Nadu to provide all types of financial assistance to industrial units in the State of Tamil Nadu and Pondicherry. The financial assistance is given to all types of units including proprietary, partnership and Joint-stock companies. Special schemes have been framed to help Technocrats and Rural Medical and Veterinary Practitioners. Concessional terms have also been offered to backward areas and backward districts.

The terms and conditions of assistance

Minimum: Rs. 1,00,000 (for small-scale industries : Rs. 25,000).

For Technocrats and Rural Medical Practitioners : Rs. 10,000.

Maximum: Rs. 25,00,000 (Rs. 2 lakhs and Rs. 1 lakh in the case of Technocrats and Rural Medical Practitioners respectively).

Rate of Interest

9.75 per cent in the case of major and medium-scale industries.

7 per cent in the case of units in backward areas and for Technocrats and Rural Medical and Veterinary Practitioners.

8½ per cent in the case of other small-scale industries.

Initial repayment holiday

2 years in the case of ordinary industries.

Up to 4 years in the case of units in backward districts.

Amortisation period

Ranging from 8 to 10 years.

Special concessional terms are available to small-scale industries, technocrats, rural medical and veterinary practitioners.

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NINE PROJECTS AND SEVEN SCHEMES SELECTED FOR DETAILED MONITORING

Nine projects and seven schemes have been selected for detailed monitoring and analysis and for developing improved and rationalised monitoring systems by the Monitoring and Information Division of the Planning Commission. The schemes selected are Feeding Programmes (Nutrition); Agro-service centres and Rural Engineering Surveys (Special Employment Schemes); Primary Health Centres and Rural Water-Supply (Health); Post Partum and Intensive District Schemes (Family Planning).

The Monitoring and Information Division was set up by the Planning Commission in April 1972 with the object of monitoring the progress and performance of selected projects in pre-construction and construction stages and of important programmes/schemes, locating areas of shortfalls and delays, identifying the factors responsible therefor and suggesting corrective action to the appropriate authorities for ensuring execution of projects and programmes within the Plan estimates of time and cost. The Division has also selected 135 projects in Industry, Mining, Irrigation, Power and Transport sectors and programmes/schemes in nine sectors and sub-sectors for collection of progress information on a continuing basis. The selected sectors and sub-sectors are: Nutrition, Education, Social Welfare, Agricultural Production, Land Reforms, Rural Electrification, Special Employment, Health and Family Planning. To cover the various projects and schemes, 25 Monitoring Groups have been formed with representatives of concerned Ministries, project authorities and Planning Commission. The reports of seven Monitoring Groups have been completed. In the case of other groups, their first phase of work is expected to be completed by the end of October 1972. The Division has also been assigned responsibility of providing technical assistance to Ministries and States and Union Territories in setting up their monitoring systems.

INDUSTRIAL PRODUCTION LOOKS UP.

The level of industrial production in the country in May 1972 rose by 10.6 per cent and 9.3 per cent compared to the corresponding months in 1970 and 1971 respectively according to figures issued by Industrial Statistics Wing, Central Statistical Organisation, Government of India. The index of industrial production in April 1972 stood at 191.3 points.

BHARAT ELECTRONICS LIMITED.

The Bharat Electronics Limited is setting up a second unit at Ghaziabad, which will take up the production of sophisticated microwave and radar equipment for the requirements of air defence. Production in the new factory is expected to commence about the middle of 1973-74. This Defence undertaking has also taken up a number of new projects including the manufacture of integrated circuits, Television Studio and transmitting equipment and mini-computers and desk calculators. The proposal for the manufacture of glass shell for TV picture tubes is also under consideration. B.E.L. stepped up its production has to about Rs. 32 crores during 1971-72. BEL has plans to further expand its production to meet the growing requirements of Defence Services, Civil Departments and electronics industry, and achieve a production target of Rs. 50 crores per annum in the Bangalore factory alone by 1974-75. The exports by BEL comprising mainly of valves and transistors during 1970-71 were of the order of Rs. 52.84 lakhs.

EMERGENCE OF NEW DAIRY UNITS.

SFDA HELPS SMALL FARMERS.

The Dairy Farming Scheme sponsored by the Small Farmers Development Agency (SFDA) is giving every hope to the farmers who own land less than 7½ acres. A good instance of the kind is

being provided by the SFDA project in the village Udho Nangal in the district of Amritsar. Fifteen small farmers of Udho Nangal had been provided in two buffaloes each by advancing a loan of Rs. 4,000 per farmer by the nearby branch of the Central Bank of India, Chowk Mehta. Of this, 25 per cent had already been adjusted by the Bank as a subsidy granted to the respective farmers by the SFDA Agency. The choice of the animal was left to the farmer who was of course assisted in the selection by the local representatives of the SFDA, Dairy Development Department and the Department of Animal Husbandry. To ensure a regular flow of milk throughout the year, the SFDA would further add a buffalo to every member's dairy unit after about six months. Under the scheme the farmers are no longer left to the mercies of private delivery milkmen or middlemen. The Milk Chilling Centre at Chowk Mehta, run by the Dairy Extension Wing of the Punjab Government purchases all the quantity of milk and is also responsible for its collection from the village centre. The higher the fat content, the better the price. It was noted at Udho Nangal that no producer received less than Re. 1 a litre. The farmers are paid half the amount due to them for the milk offered. The rest of it goes to the Bank and adjusted is towards loans. With this system in operation, the SFDA has overcome one of the major difficulties faced by the small farmers, that of easy credit. Earlier, the private milkmen would advance small sums to the needy farmers and then would go on purchasing milk at rates usually lower than the market price. The small land holdings in Udho Nangal, which appeared to be uneconomical so far, are proving viable now. They produce "char" for the buffaloes and the farmers can go on expending their dairy units steadily. They wanted to contribute to the Green Revolution; but they are happily equipped today to subscribe to the White Revolution which is in the offing in the country.

HOW DEEP IS ENGLISH

The number of books published in India is disproportionately high. Is it possible to scrap overnight a system that has taken such firm and wide-spread roots? No, say, the supporters of English, and they feel that any attempt to hasten the banishment of English from Indian administration and education will have an irremediably adverse effect on both.

Four basic layers have made up the pattern of the Indian "Palimpsest"—Dravidian, Aryan, Middle Eastern and European. The last three brought invading settlers, and they brought three religions (Hinduism, Islam and Christianity), three political systems, and three official languages (Sanskrit, Persian and English). And the latest addition, English, is very much a "Natural" part of the linguistic spectrum.

How closely a part? That question leads us to the question of a "directing class", which can give expression to Indian cultural values by interpreting the enduring truth of the layers, can transmit them to contemporary generations, and can thereby ensure the continuity of the tradition.

Without vision, the people perish; they perish too, or at least decay slowly, when there is no revision of ancient verities.

To argue, therefore, that English as used in India, is not one of the Indian languages is to raise another, and very important, question. What makes a thing India?

It is not religion, for people of different and even opposed faiths call themselves Indian. It is not food, dress or customs; all these differ enormously in different places. And it is not language. The fact that Hindi derives from Sanskrit does not make it necessarily more Indian than Urdu, which derives from Persian, or more than English, which derives from Anglo-Saxon or Latin.

IN INDIA?

AND WHY?

If Democracy cannot give equal advantages to all, it should at least provide everybody with an equal disadvantage, says the Author.

Excerpts from an article
by P. LAL, Editor The
Miscellany. Published by
Writers Workshop,
Calcutta.

To be Indian is surely to go beyond such trivia; the experience of being Indian should not be confused with religious nationalism nourished by a chauvinistic passion for a majority language. Few activities are shodder than the hawking of languages by money-changers in the temple of Demos.

"Snob" Language.

What I have written so far is partly a serious and partly a sentimental presentation of the case for English.

True, English, as a "snob" language of white and brown sahibs, has played a divisive role in education and society. When Lord Macaulay suggested making English the medium for higher education in India, it was not without a certain sneer at indigenous traditions. He was afraid that without English "sound philosophy" and "true history" would not get taught in Indian schools and colleges. It remains sadly true that English snootily gives the best jobs in Indian society to those who know it, and such people are invariable the sons and daughters of the affluent.

The situation is complicated by promises made and assurances given regarding the status and use of English. It is further complicated by the co-existence of fourteen official languages and by the fact that in 1967 English was named the official language of one Indian State, Nagaland. Another complications is the problem of finding a medium for instruction at college and university levels that will satisfy all the linguistic regions. Nor will the language tangle be simplified if the language of the courts—still, for most purposes, English—is changed.

Answers? Solutions? Perhaps no final ones. In doubts the best course is to be realistic, to keep the course is to be realistic, to keep status quo with only the barest minimum of changes. Or follow the principle that if democracy cannot give equal advantages to all, it should at least provide everybody with an equal disadvantages.*

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