

Tamil Arasu

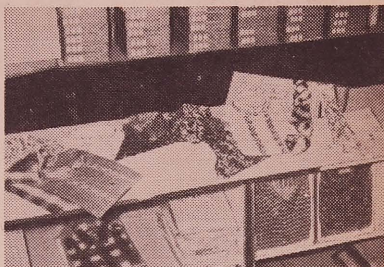
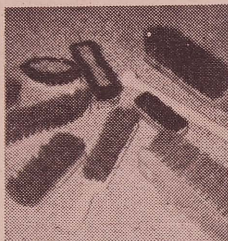
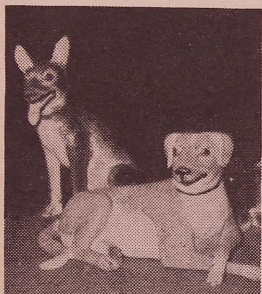
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Tamil Arasu

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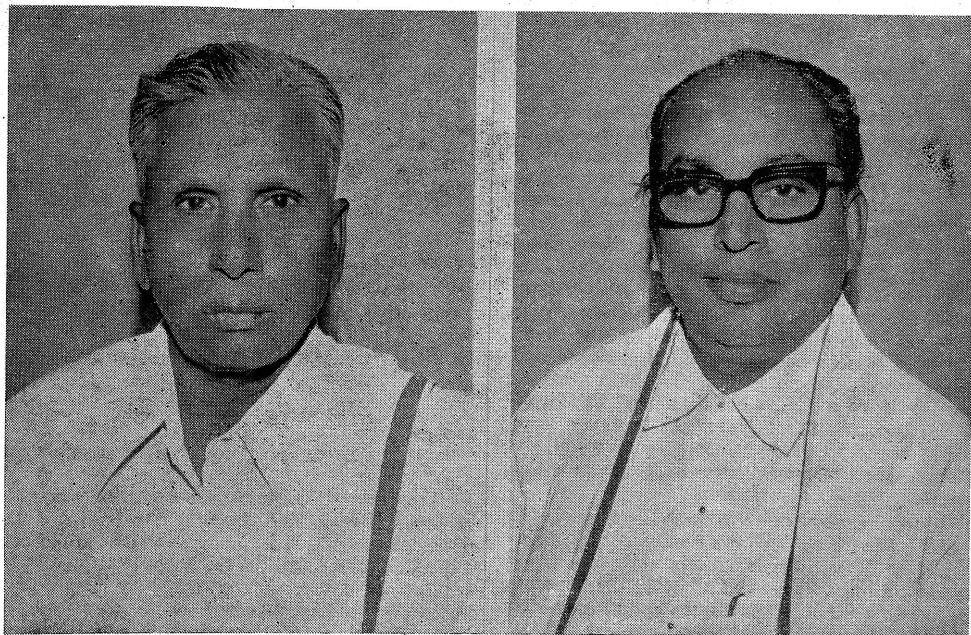
SECOND RAILWAY OVERBRIDGE AT MADURAI

The Rs. 29.3 lakh railway overbridge (cover page) declared open by Dr. M. Karunanidhi, Chief Minister on 21st April, 1974 is the second of its kind constructed in Madurai City within one and a half years. The overbridge goes a long way in relieving the congestion of traffic on the Madras to Kanyakumari Trunk Road near Madurai.

The overbridge is 1,576 feet long and 45 feet wide. Pre-cast concrete beams have been used in the construction of the overbridge. The overbridge has been designed and constructed in such a way as to allow separate subways for pedestrians and for slow-moving vehicles. The work on the overbridge was completed within a record time of two and a half years with saving to the extent of Rs. 3 lakhs over the estimated cost i.e., Rs. 32.3 lakhs. The Railway Administration and the Madurai Corporation shared the cost to the extent of Rs. 10.96 lakhs and Rs. 10.67 lakhs respectively, and the balance was met by the Highways Department.

As has been observed by the Chief Minister in his inaugural address, the railway overbridge is named after Thiru Muthuramalinga Thevar in recognition of his services to the country.

The Two New Ministers Of Tamil Nadu Cabinet



THIRU N. RAJANGAM,
Minister for Harijan Welfare.

THIRU C. V. M. ANNAMALAI,
Minister for Social Welfare.

CHIEF MINISTER'S FUND CREATED FOR REHABILITATION OF PHYSICALLY HANDICAPPED

SOCIAL WELFARE — Massive Programme for the Rehabilitation of the Physically Handicapped — Creation of a Special Fund thereof — “Chief Minister’s Fund for the Rehabilitation of the Physically Handicapped” — Constitution of—Orders issued.

SOCIAL WELFARE DEPARTMENT

G.O. Ms. No. 396

Dated the 18th May, 1974.

The Government have recently ordered a comprehensive survey of the Physically Handicapped, both educated and un-educated, in our State. The survey has revealed that there are about 2.53 lakhs of Physically Handicapped persons (so defined as to include the Orthopaedically Handicapped, the Blind and the Deaf and Dumb). There has not so far been an organised approach to the rehabilitation of these disabled persons on a scale and scope commensurate with the magnitude of the problem. Government have carefully examined the various aspects of this problem in the light of the recent survey and have decided, as a first step, to launch a massive programme on an integrated and co-ordinated basis for the rehabilitations of about 25,000 poor physically handicapped persons during 1974–75 at a cost of Rs. 100 lakhs. **This unique welfare programme, which will open out to the Physically Handicapped people opportunities for a fuller and richer life, is to be inaugurated on 3rd June, 1974—the 51st Birthday of the Chief Minister of Tamil Nadu.** As in the past, the coming birthday of the Chief Minister will thus happily coincide with the memorable inauguration of yet another welfare programme of one of the most neglected section of our society — the Physically Handicapped in our State. Government consider that the active co-operation and involvement of the people is vital for the success of this massive thrust for the rehabilitation of the Physically Handicapped in Tamil Nadu. Government hope with confidence that public contributions would be forthcoming in an abundant measure to sustain this noble cause.

The Government have accordingly decided that a Fund called “The Chief Minister’s Fund for the Rehabilitation of the Physically Handicapped” should be constituted with immediate effect and that the amounts realised through voluntary collections should be credited to this Fund.

The resources for the Fund will be mobilised in the following manner :—

(a) By voluntary donations from individuals and institutions.



Hearing aid brings this child the joy of hearing herself.

(b) By conducting a Special Raffle, the entire proceeds of which will be credited to the Chief Minister’s Fund for the Rehabilitation of the Physically Handicapped.

(c) Funds collected from other sources.

The moneys thus collected towards this Fund will be deposited in an account entitled “The Chief Minister’s Fund for the Rehabilitation of the Physically Handicapped” in such Nationalised Banks as the Government direct. The rules for the administration of the above Fund and the audit of the accounts will be issued separately.

The Government also constitute a Committee for the administration of the above Fund consisting of the following members :—

- (i) Minister for Social Welfare—Chairman.
- (ii) Secretary, Social Welfare Department—Member.
- (iii) Additional Secretary, Social Welfare Department—Member.
- (iv) Deputy Secretary, Finance Department—Treasurer.
- (v) Director of Social Welfare—Secretary.

Four Non-Official members will be nominated to the Committee in due course. The term of the non-official members will be for two years. The Secretary to the Committee shall be the controlling authority for purposes of countersigning the Travelling Allowance Bills of non-official members of the Committee. The Deputy Secretary to Government, Finance Department will be the Treasurer of “The Chief Minister’s Fund for the Rehabilitation of the Physically Handicapped” and also issue cheques and maintain the accounts thereof. *

Details Of The Programme To Help The Handicapped

At the instance of the Chief Minister, a comprehensive ground level survey of the physically handicapped, both educated and uneducated, has been undertaken and completed recently in Tamil Nadu (details given elsewhere). The survey has revealed that there are about 2.35 lakhs of physically handicapped persons (so defined as to include only the Deaf and Dumb, the Blind and the Orthopaedically handicapped) and out of this 1.15 lakhs of persons are orthopaedically handicapped, 72,745 persons deaf and dumb and 46,118 persons blind.

It will be recalled that ever since his 48th Birthday in 1971 an attempt has been made to harness the people's natural enthusiasm to a worthwhile cause. The Chief Minister's Birthday on 3rd June has always coincided with the inauguration of several imaginative schemes for the welfare and emancipation of the helpless in our society. The 48th birth day of the Chief Minister in 1971 saw the inauguration of a massive programme for the rehabilitation of leprous beggars which has been greatly acclaimed in India and abroad. The 49th birthday of the Chief Minister in 1972 was marked by the most laudable scheme of giving sight to the sightless through well-organised eye camps. The 50th birthday in 1973 paved the way for the socio-economic emancipation of one of the most suppressed sections of our society—the operators of hand-drawn rickshaws by giving them Cyclo-rickshaws instead. The 51st birthday of our Hon'ble Chief Minister in 1974 is being marked by the memorable inauguration of a massive programme for the welfare and socio-economic rehabilitation of the physically handicapped in our State. Fourteen different schemes have been devised for this purpose as follows :

SCHEMES FOR THE 16-50 AGE GROUP

Apprenticeship scheme

One of the main bottlenecks that we face in the sphere of economic

rehabilitation of the physically handicapped is the traditional prejudice against their employment. A fruitful line of approach would be to induce the employers to take in physically handicapped persons as apprentices.

The proposal is to recruit 1,000 physically handicapped persons at a total cost of Rs. three lakhs during 1974-75 as apprentices in a few selected departments / Government Corporations such as the Transport Department and Government Transport Corporations, the Stationery and Printing Department, Tamil Nadu Small Industries Corporation and the Kadi and Village Industries Board. Each physically handicapped apprentice would be given a stipend of Rs. 50/ per month for a period of six months subject to the condition that each such apprentice is absorbed in regular employment in the concerned undertaking on completion of his training. All applications will be collected and processed by the Revenue Divisional Officers and sent to the Collectors for consolidation and final selection. At the District level, a committee headed by the Collector with the District Medical Officer, the District Employment Officer and other officials to be co-opted if necessary, would scrutinise the applications, interview the physically handicapped persons concerned, and select the beneficiaries.

2. Training-cum-Production Workshop

One Training-cum-Production Workshop to cater to 150 physically handicapped persons will be established on the Madras-Mahabalipuram highway at a cost of Rs. 10/ lakhs. Each trainee will be paid a stipend of Rs. 100/- during the period of training.

3. Training for employment in labour-intensive industries

5,000 physically handicapped persons will be trained in the following labour intensive occupations—

(a) Match making ; (b) Beedi making ; (c) Handlooms and (d) Hosiery

Stipend will be given to each trainee at the rate of Rs. 30/- p.m. The training centres will be located in close proximity to the areas where these industries are now concentrated. A provision of Rs. 5 lakhs for this scheme during 1974-75 will be set apart.

4. Secretarial courses

It is proposed to start 20 centres for giving training in type-writing and short-hand to S.S.L.C. passed orthopaedically handicapped and deaf and dumb at a total cost of Rs. 8,80,000/- during 1974-75. During the period of training such trainee will be given a stipend of Rs. 30 p.m. Each centre will cater to 20 persons. As far as possible the centres will be run in public buildings in order to ensure that no expenditure is incurred on hiring out of private buildings for this purpose.

5. Tailoring Centres

20 Tailoring Centres will be opened during 1974-75 at a cost of Rs. 5,47,700. Each centre will cater to 20 physically handicapped persons and each trainee will be given a stipend of Rs. 30/- per mensem. The orthopaedically handicapped persons and the deaf and dumb can be productively employed in Tailoring Centres.

6. Training in the verification and sorting out of punch cards of computers :

S.S.L.C. passed 100 deaf and dumb and Orthopaedically handicapped persons will be trained in the verification and sorting out of punch cards of computers at a cost of Rs. 80,000/- during 1974-75. Each trainee will be trained for a period of four months and the trainee will be paid a stipend of Rs. 50/- each. The training programme will be organised in the Data Processing Centre, Madras.

7. Preferential treatment

Certain posts like Lift Operators will exclusively be reserved for the physically handicapped persons. The need for the introduction of legislation along the lines of the disabled persons (Employment Acts, 1944 and 1958 as in Great Britain, would be considered in our State also.

8. Opening of Special Employment Exchanges

At present only in Madras City there is a Special Employment Exchange for the physically handicapped. The extension of the existing scheme of special employment exchange in Madras City to the other Districts in the State will be considered by stages in a phased manner.

FOR THE AGE GROUP OF 6 TO 16 YEARS.

9. School for the deaf and dumb and the blind

The existing facilities for the Special education of the deaf and dumb and the blind in our State are totally inadequate. At present we have only about 15 schools for the deaf and dumb providing special educational facilities for about 1,600 deaf and dumb children as against the total number of 10,700 deaf children in the State in the age group of 6 to 16 years.

Five special schools for the deaf and dumb and 5 special schools for the blind are to be started during 1974-75 at a total cost of Rs. 6 lakhs. Since there is an acute dearth of trained teachers for the physically handicapped, an amount of Rs. 3 lakhs will be set apart for opening a centre for training special teachers for the physically handicapped persons.

10. Schools for Orthopaedically handicapped children in hospitals

Many of the orthopaedically handicapped children (especially those afflicted with polio) will have to undergo a long period of treatment involving physiotherapy in hospitals. Unless schools are attached to the hospitals, these children will not get the benefit of education in their impressionable years.

To provide educational facilities to polio affected and other orthopaedically handicapped children while they are receiving physio-therapeutic treatment, 15 schools during 1974-75, at a total cost of Rs. 7.5 lakhs will

be started. Each of these schools will be attached to the concerned District Headquarters Hospital. In Madras City it will be attached to the Artificial Limbs Centre in the General Hospital. The details of syllabi and other matters connected with curriculum in these schools will be finalised in the light of the actual age distribution of the Orthopaedically affected children and their educational attainments.

THE AGE GROUP OF OVER 50 YEARS

11. Old age pension benefits

There are 53,840 physically handicapped persons in this age group consisting 23% of the total physically handicapped population. An old age pension scheme will be introduced in regard to this age group. The existing budgetary allocation for grant of old age pension will be increased to Rs. 150/- lakhs. This would mean giving benefit to 20,000 additional beneficiaries. Out of this increased number 10,000 beneficiaries will be reserved exclusively for the Physically Handicapped. The existing age limit for qualification for old age pensions which is at present 60 will be lowered to 55 in the case of the physically handicapped. This scheme will be applicable only to destitutes as defined in G.O. Ms. No. 73 Finance (Pension) Department, dated 22nd January, 1962.

GENERAL SCHEMES

12. Distribution of 1000 hearing aids

Almost all the deaf children from the poorer classes find it impossible to buy hearing aids because they are very expensive and is beyond the reach of most deaf children. 1,000 hearing aids (each costing not more than Rs. 300/-) will be distributed to 1,000 poor deaf and dumb children at a total cost of Rs 3 lakhs during 1974-75. Vigorous action will be taken to develop low-cost indigenous hearing aid with local resources in order to ensure that the maximum number of deaf and dumb children get the benefit of this scheme within the over-all financial allocation approved.

13. Free distribution of wheel Chairs

The disability in the case of orthopaedically handicapped persons is often made more severe for want of mobility. In fact the easiest

way to make him more mobile is by giving him a wheel chair. Unfortunately most of the orthopaedically handicapped persons will not be in a position to buy wheel chairs in view of their very high prices. Hence during 1974-75, 2,000 wheel chairs for about Rs. 15 lakhs will be distributed to poor Orthopaedically Handicapped persons who have lost the use of both their legs (each wheel chair will not cost more than Rs. 750/-)

14. Assistance to voluntary agencies

There are a large number of voluntary agencies in Tamil Nadu engaged in the noble task of rehabilitation of Physically Handicapped with a distinguished record of Service. Many of them are not in a position to expand or improve their services on account of financial constraints arising from spiralling prices. Financial assistance to such agencies in the shape of grants will be given to enable them to absorb more and more physically handicapped persons. The Social Welfare Department will scrutinise each application from Voluntary agencies on merits with reference to the existing guide-line and regulations.

A HOME FOR THE PHYSICALLY HANDICAPPED

(a) The total estimate of expenditure, which the foregoing schemes will entail, will be about Rs.100 lakhs. The number of beneficiaries are estimated at around 25,000/-. The resources for the programme will be raised in the following manner :—

(i) Voluntary donations which will be credited to a Fund entitled "Chief Minister's Fund for the Rehabilitation of the Physically Handicapped".

(ii) The proceeds of a Special Raffle.

(iii) Government budgetary allocations to cover non-recurring and recurring expenditure.

(b) Except in regard to the Training-cum-Production Workshop Scheme, the physically handicapped beneficiaries will include equal number of men and women.

(c) At the Chief Minister's suggestion one of the Leprosy Beggar Rehabilitation Homes will be converted into a Home for the Physically Handicapped persons. One of the Leprosy Beggar Rehabilitation Home in Dharmapuri district will be considered for such conversion.

C.M.'s Noble Gesture for Handicapped Cited

The lot of the handicapped in a poor country is particularly miserable. At a time when a large number of those who are whole and sound are unable to lead a full life because of unemployment, the handicapped find themselves in an invidious position. When they seek employment, they are often regarded with jealousy and even hatred. Though, through training, they are as fully suitable as the more fortunate for employment in most fields, employers are reluctant to utilise their services. Laws exist for the amelioration of their conditions, but they remain a dead letter. The welfare scheme which has been drawn up in Tamil Nadu to mark the 51th birthday of the Chief Minister seems to be well devised and, if implemented properly, will bring cheer to the 2.3 lakhs of handicapped people in the State.

It has been a happy idea of Mr. Karunanidhi to mark his birthday in recent years with schemes to help the poor. Earlier welfare schemes include rehabilitation of beggars, free eye camps and distribution of cycle-rickshaws to hand-rickshaw pullers. But two score years and ten in a man's life is a landmark, and this year the scheme is rightly ambitious. Costing a crore of rupees initially, it will bring solace to the handicapped persons in a variety of ways. The blind, the deaf, the dumb, the halt and the lame have all a scheme for themselves. Particularly notable is the decision to set up five schools each for the blind and deaf and the blind. The emphasis in many of the schemes is on help to the handicapped to help themselves. An engineering workshop, costing ten lakhs of rupees, is to be set up to train 150 persons in various skills.

The schemes have been formulated after much care and with much deliberation. Part of the money needed is to be raised through a

special raffle. Public contributions will also be accepted. It is to be hoped that the public response will be generous. Nothing is more sad in the Indian streets than to see the lepers, the blind and the lame begging their bread. The sight is an indictment of the Welfare State which, despite its promises, has failed to keep them from destitution. In Tamil Nadu, the State is discharging its responsibilities to a great extent. An earnest of this is the present scheme. The rest of the country can not do better than follow the Tamil Nadu example.

—The Indian Express
Editorial dated
20th May, 1974.

TAMIL NADU TOPS IN PER-HECTARE YIELD OF RICE AND RICE PRODUCTION

The Study of "Dynamics of Paddy — Rice System in India" conducted by the Indian Institute of Management, Ahmedabad reveals that Tamil Nadu tops the list of the States in productivity of rice per hectare. It has registered a 32.84 per cent increase in this respect between 1960—61 and 1970—71. In Tamil Nadu production has risen from 1,486 Kg. to 1974 Kg. during the period under study. Despite its being an agricultural State, Andhra Pradesh occupies only the fourth place in this regard with the yield of 1,369 Kg. in 1970—71 while Karnataka and Kerala rank second and third.

In the matter of total increase in paddy production also Tamil Nadu stands first followed by Andhra Pradesh.

PENSION FOR THOSE WHO WERE IMPRISONED IN CONNECTION WITH THE ANTI-HINDI AGITATION

The Government have recently introduced, on the analogy of the Freedom Fighter Pension Scheme, a scheme for the grant of pension of Rs. 75/- per month to those who were imprisoned in connection with the Anti-Hindi Agitation in 1965 and in the agitations held for the merger of Tamil speaking areas in Kanyakumari and Tiruttani with the then Madras State.

The scheme applies to those participants in the agitations who were sentenced to imprisonment or were held under detention or were kept in remand for not less than **three months** or were awarded capital punishment or become permanently incapacitated due to firing or lathi-charge for their participation in these agitations. The dependants of the participants who were killed in action during these movements and the dependants of those participants who are not alive, are also eligible for pension. The pension is sanctioned in such cases subject to the following restrictions :—

(a) to the wife till her death or re-marriage.

(b) to the minor daughter till her marriage or till she attains the age of 21 years whichever is earlier.

(c) to the minor son till he attains the age of 18 years.

The applicant should satisfy the following conditions :—

(i) he/she should be a permanent resident of Tamil Nadu and

(ii) his/her personal income should not exceed Rs. 100/- p.m.

All the eligible persons are requested to contact the Collectors or the Tahsildars concerned for the supply of forms to apply for the pension.



HOW TO TEACH **TAMIL** TO THE FOREIGNER?

A number of American Universities have started giving importance to the study of South Indian languages and literature. The Centre of Advanced Study in Linguistics at the Annamalai University in Annamalai Nagar, Chidambaram, is collaborating with the Universities of Michigan, California and Pennsylvania in this work. The linguistics centre offers facilities for learning Tamil, Telugu, Malayalam, Kannada, Hindi, Bengali and Urdu, and tribal languages such as Kota, Toda, Kudagu, Irula and Nilgiri.

The centre's scholars in these various languages visit the American Universities every year to share their knowledge through lectures and assist the faculty to prepare the syllabi for various levels of learning.

"Our work," says Prof. S. Agesthalingom, Director of the Annamalai Centre, "aims to explain the structural patterns of the Indian languages and their differences with those of English." To highlight this objective, the centre's scholars have formulated special linguistic drills and grammar lessons. They have also written textbooks to meet the needs of the American student. "These books," Prof. Agesthalingom adds, "are different from those offered to Indian students."

The American students, Prof. Agesthalingom explains, like other

INTERESTING RESEARCH AT ANNAMALAI UNIVERSITY

foreign students learning an Indian language for the first time, need special teaching materials because most of them are in older age groups. They are familiar and more accustomed to the vocabulary and grammar of their mother tongue—English—which are far different from those of any Indian language.

Prof. Agesthalingom himself spent a year (1970—71) at the Michigan University as Curriculum Studies Consultant for Tamil.

What has this linguistic assistance accomplished?

"More than just additional knowledge," the Annamalai linguist says, "it has helped to evoke a better appreciation for the South Indian languages like Tamil on American University campuses."

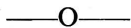
According to him, linguists in the U.S. regard Tamil as a classical language like Sanskrit because of its 2,000 years of uninterrupted history and rich literature. He recalls an incident while participating in a 5,000-strong linguistic conference in Michigan in 1970. Some participating American delegates walked up to him during the intermission and remarked that after learning Tamil they were "astonished at its richness."

The Michigan University is also involved in yet another of the Annamalai centre's projects. The joint endeavour will research the historical inscriptions of ancient South Indian kings—the Cholas. Dr. Thomas Trautmann, who is on the faculty of the South Asian and South-East Asian Centre at the Michigan University, is Prof. Agesthalingom's counterpart in the study.

The Michigan—Annamalai project which is two-year old when completed will open a new chapter in the cultural and intellectual relations between India and the U.S.

AFRICAN ROOTS OF TAMIL CULTURE

Rediscovered



PRESIDENT SENGHOR OF SENEGAL'S TALKS WITH TAMIL SCHOLARS

His Excellency Leopold Sedar Senghor, President of Senegal is the first Head of State to visit Tamil Nadu. In a one week stay in India, he spent 5 days and 4 nights in this State because the primary purpose of his visit was, as he said, "to meet the Tamil people, discuss with their intellectuals and scholars means and methods of strengthening the time-honoured and historical common origins between Negro-African and Dravidian history and culture and see something of Tamil achievements in music, dance, architecture and literature." He was the first Head of State to meet a group of Tamil scholars (including M.P. Sivagnanam, M. Varadarajan, B. Natarajan, K. Mahadevan, Meenakhisundaram, Subbiah K. Draviam, Sundaram, Asaithambi, K.K. Pillai, Badrinath, Maulvi Azad, Shanmugasundaram and some 20 others) at which the links between Tamil and his language Wolof and between Negro and Dravidian cultures were discussed. He referred to his research over 30 years into Dravidian linguistics, going back to the Harappa and Mohenjodaro scripts which demonstrated the common basis between the ancient Negro, Egyptian, Sumerian and Dravidian peoples, languages and cultures. He regretted the absence of Africa at the 4 sessions of the World Tamil Conference at Kuala Lumpur (1965), Madras (1968), Paris (1970) and Jaffna (1972) because unlike the European and North American scholars who participated in these conferences to discuss Tamil history and linguistics, Negro-African Scholars had common links with Tamil civilization. He pointed out to Thiru Mahadevan that the linking of Tamil and the proto-Dravidian, Indo-Sumerian scripts with uralo-Altaic languages by Finnish scholars was only partially helpful as the major links of the Dravidian languages were with Negro-African languages. He announced that Senegal would invite the World Tamil Con-

ference to hold its 1978 session in Dakar at which African scholars will join with world scholars in further diffusing the heritage and greatness of Tamil language, history and culture.

A Short Resume

BY

DR. MALCOLM S. ADISESHIAH

Responding to the suggestions by Dr. B. Natarajan, Thiru K.K. Pillai and Thiru M. Varadarajan, Thiru Senghor said that there is need for research not only into Dravidian and Negro-African linguistics which is being carried out by the Senegalese Professor in linguistics Cheikh Tidiane N'Diaye at Annamalai University and by Dr. Upadya in the Indo-African section of Dakar university, there is also need for research and studies into Tamil and Negro archaeology, geology, art and music, philosophy, religions and trade and commerce. He would use the Indo-Senegal cultural cooperation agreement signed last week in Delhi to arrange for an exchange of historians archaeologists, dance and music specialists, economists and philosophers to promote this urgently needed study and investigation to this multifaceted Dravidian Negro relationship.

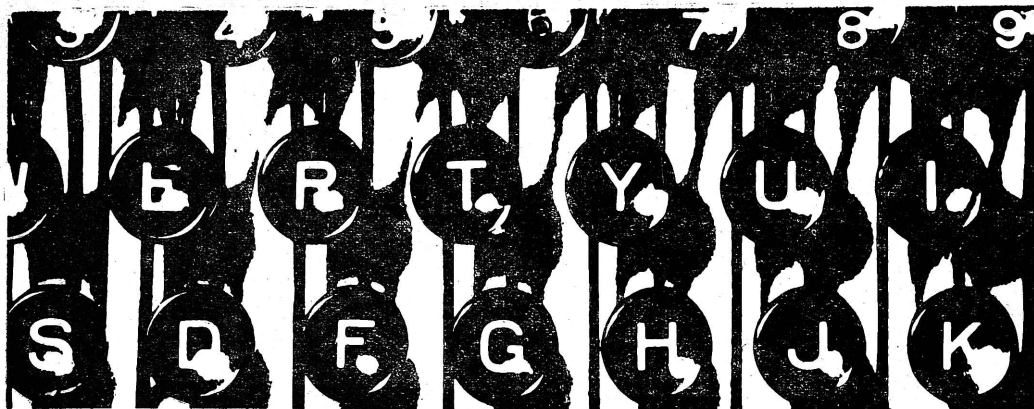
COLOUR BAR HAS NO PLACE

In response to Thiru Badrinath's fears that the hierarchical, almost racist element, in Indian culture (wherein white is always preferred to black) might endanger the close cultural ties which President Senghor was anxious to promote, the President pointed out that Dravidian culture was a classless culture as was the ancient negro culture. As the contact of Negro culture with Arab culture brought in hierarchical elements, so the penetration of Aryan culture among Dravidian people introduced similar elements. But

such unequal theories and social structures have to be discarded and are being discarded as we return to a sense of our glorious egalitarian past. It was in consideration of this kind of truth that he invited India to be represented by a delegation from Tamil Nadu at the Second World exposition of Negro art to be held in September this year at Nigeria, where the common egalitarian nature of Negro African culture like that of Dravidian culture will be demonstrated.

The President's attention was called to the danger of cultural revivalism which too much stress on Negritude or Dravidianism might involve. The President pointed out that all cultures today are both inter-related and open. The greatness of India was the confrontation of the two great cultures-Aryan and Dravidian. It was India's genius that she had at its head a great Aryan personality, Smt. Indira Gandhi as its leader, a leader who realises and recognises the uniqueness of Dravidian culture and the solid and strong contribution that Tamil people through their art and music, their government, industry and trade are making to the totality of India. As long as there is this kind of cultural confrontation and enriching dialogue, Dravidian culture like its cousin the African-Negro culture will never turn inward but will be constantly giving and receiving from others. He commended the renaissance of Tamil culture that characterises the present times.

The President was fascinated in examining the classical Tamil musical instruments in which he found some fundamental similarities with those of Africa. Carnatic music as demonstrated by Thiru. Chittibabu and Bharatanatyam as demonstrated by Selvi Padma evoked for him similar basic rhythms in African music and dance into which Arab and European influences later penetrated in the case of Africa and Aryan nuances in the case of Dravidian music and dance. The South Indian bronzes that he saw in the museum and the temple at Mahabalipuram were for him embodiments of the sensuality and sensitivity of the Dravidian people. The President's dialogue with Tamil Scholars and people brought to them a new understanding of the genius and greatness of Black people and to the President a new sense of the oneness of the great Dravidian and Negro African peoples.

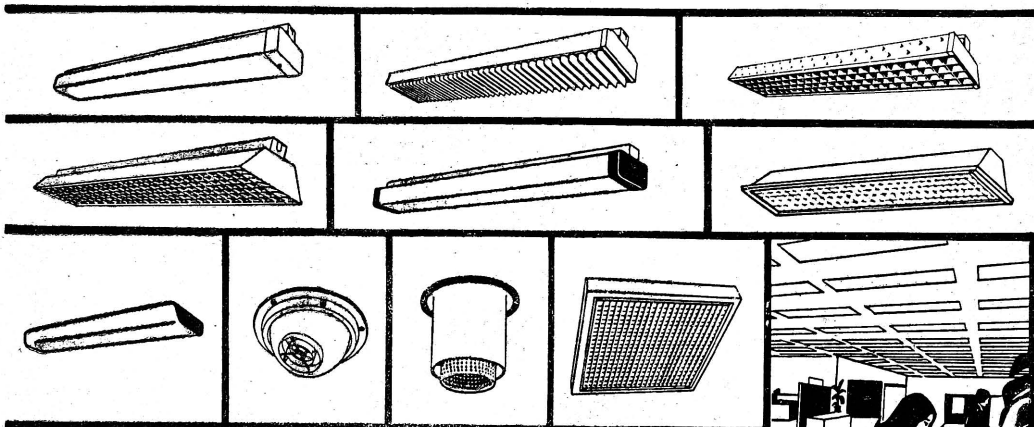


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Secondary Education

The State of Tamil Nadu will spend a sum of Rs. 138 crores on all varieties of education in 1974—75. Some aspects of Secondary Education are discussed in this article.

The population in the age group 14—17 in Tamil Nadu was 22.38 lakhs in 1973—74. Out of this 7.39 lakhs were actually in schools in Standards 9 to 11, working out to an enrolment percentage of 33. There are 2,823 High Schools in the State.

AIDS TO SCIENCE TEACHING

The scheme for grant-in-aid to High Schools for the purchase of science equipment and setting up of science laboratories, under which Rs. 15,000 is given for equipment and Rs. 25,000 for laboratory buildings to each school will be continued in 1974—75 with an outlay of Rs. 35 lakhs to benefit 90 schools. So far, 810 High Schools have been benefited under this scheme. All the 14 mobile science laboratory vans, equipped with science apparatus for High Schools, are functioning one in each Revenue District in the State, roughly one van for more than 3 Educational districts. It is the Department's aim to extend this facility and to make available one van to each of the 47 Educational Districts in a phased manner. Three more vans were added during 1973—74 and 10 more during 1974—75.

A Pilot Project for improving science teaching in schools with

in Tamil Nadu

UNICEF assistance has been introduced in 50 Elementary and 30 Middle Schools in the three Districts, Madras, Chingleput and South Arcot. The new science syllabus in the project was introduced for these schools in Standards 1 to 3 and Standard 6 in 1971—72, Standards 4 and 7 in 1972—73 and Standards 5 and 8 in 1973—74. To equip the teachers to implement this programme, selected graduate teachers were given orientation training, and these recourse personnel in turn gave in-service training to all the teachers of the schools where the project is working. The scheme will be extended to more schools in 1974—75 with UNICEF support.

Summer Science Institutes in Biology, Physics, Chemistry and Mathematics have been conducted every year since 1969 with the help of National Council for Educational Research and Training and University Grant's Commission for the benefit of science and mathematics teachers. Over 1,000 high school teachers have already been trained, and about 160 more high school teachers will receive re-orientation during 1974—75.

THE STATE INSTITUTE OF EDUCATION

The Government have also sanctioned the establishment of a State Institute of Science Education as a wing of the State Institute of Education, Madras. The Institute will be in charge of improvement of science education in schools, improvement of science curriculum, teacher's training programme, research, publications and extension service.

The State Institute of Education, Madras is the State-level counterpart of the National Council for Educational Research and Training and is in-charge of in-service education at the school-level. Besides conducting several in-service programmes, the Institute is also initiating research on various problems relating to teaching techniques and curriculum development. A Primary Education Extension Centre is also attached to the Institute.

In accordance with the suggestion made in the Kothari Education Commission Report, one Model



Dr. M. Karunanidhi, Chief Minister declaring open the Dr. Ambedkar Government Arts College.

School for Boys has been opened at Pudukkottai in 1972—73, and one for girls in Madras in 1973—74. These schools which have highly qualified staff and offer residential facilities, will admit students with proved merit and talents, many of whom will be supported by scholarships.

The Kothari Education Commission also recommended the concept of comprehensive schools with a view to vocationalising Secondary Education. It is proposed to establish about ten such comprehensive schools, by developing the existing schools and providing facilities for general academic courses as well as vocational courses. Subjects like agriculture, tailoring, wood-working, radio repairing, television servicing, etc., will be introduced, to equip students for self-employment and also employment in industries. A provision of Rs. 8.50 lakhs has been made for this purpose in the Budget for 1974—75.

BUILDING PROGRAMME

Of about 2,800 high schools in our State, nearly 1,200 are badly in need of adequate accommodation. In 1974—75 a provision of Rs. 19 lakhs has been made for grants to municipal schools and aided schools and about Rs. 60 lakhs for Government High Schools and Government (Board) High Schools and for repairs to existing buildings.

SCHOLARSHIPS

School Education in Tamil Nadu is free at all stages. The award of rural talent scholarship at the rate

of Rs. 1,000 per annum for each boarder and Rs. 500 per annum for each day-scholar at the rate of two per each Panchayat Union, which was introduced in 1971—72, will be continued in 1974—75 also. Besides this, generous educational concessions continue to be offered to the children of Burma and Ceylon repatriates, ex-service and defence personnel, Scheduled Castes and Scheduled Tribes, Goldsmiths affected by the Gold Control Act and political sufferers.

A pilot project for medical check-up of students was introduced in the city of Madras, for about 5,000 pupils in the Elementary and Secondary Schools in the year 1971. In the Districts of North Arcot, Salem, Coimbatore, Tiruchirappalli and Madurai, mobile medical vans with qualified physicians visit the schools and conduct medical check-up. This scheme is proposed to be extended to other districts also.

SCHOOL IMPROVEMENT CONFERENCES NET Rs. 2.54 CRORES

In order to mobilise local effort and initiative in improving the facilities in the schools, more than 500 school improvement conferences have been conducted till now and assistance in the order of Rs. 13 crores has been secured from the public. The programme is being continued vigorously, with an accent on Science-cum-Library Improvement. As a result of voluntary effort, 39 lakhs of pupils were given free uniforms at a cost of Rs. 2.54 crores so far.

TAKEOVER OF MUNICIPAL HIGH SCHOOLS

Seven Municipal High Schools were taken over by Government in 1972—73 in order to provide relief to the municipalities which were finding it difficult to run the schools. A provision of Rs. 10 lakhs has been made for the takeover of more municipal schools in the year 1974—75 and it is expected that about 10 more municipal schools will be taken over.

NATIONALISATION OF SCHOOL TEXT BOOKS

The Tamil Nadu Text-book Society which has been entrusted with the responsibility of producing and distributing text books for schools has done good work in producing books of high quality at reasonable prices. Books under the revised syllabi are being brought out by the Society in a phased programme spread over four years, from 1972—73, to 1975—76. During 1973—74, the Society printed and distributed about 232 lakhs copies of school books. The production programme for 1974—75 envisages the printing of about 200 lakhs of copies of schools books. Non-language textbooks in the minority languages of Urdu, Malayalam, Telugu and Kannada are also proposed to be brought out progressively commencing from the school year 1974—75.

The publications of this Society are distributed through 57 approved taluk stockists supported by about 800 registered retailers all over the State. This organisation has en-

1965—66

1973—74

As on 1—8—73

<i>Types of Institutions</i>	<i>Number of Schools</i>	<i>Number of students enrolled</i>	<i>Number of teachers employed</i>	<i>Number of Schools</i>	<i>Number of students enrolled</i>	<i>Number of teachers employed</i>
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Elementary Schools' ..	24,641	30,57,708	88,173	26,726	37,58,331	1,06,332
High Elementary Schools ..	6,065	18,64,035	59,943	5,773	22,13,981	66,843
High Schools including Anglo- Indian, Matriculation and Schools ..	2,234	12,07,869	48,574	2,823	16,21,033	65,959

sured that the text-books are available at fixed price well in time to the school students.

AIMS AND OBJECTS OF SCHOOL EDUCATION DEPARTMENT

The aims and objects of the Department of School Education are :—

1. To expand educational facilities.
2. To achieve cent per cent enrolment of the pupils of the age groups 6—11, 11—14 and 14—17.
3. To improve the quality of education in educational institutions by providing or assisting in the provision of adequate school buildings, adequate equipment, laboratories, libraries, additional teachers for the additional enrolment of pupils in the schools, free supply of midday meals to poor pupils and free supply of books and uniforms to the needy pupils.
4. To disseminate and promote science education in a sustained manner.
5. To implement a wider scheme of adult education.
6. To provide such incentives as may be considered necessary for the welfare of students and teachers.
7. To provide in-service training courses for the professional growth of teachers in a big way through seminars, workshops, etc., and to reform the present system of examination by introducing the Internal Assessment Scheme.

QUANTITATIVE DEVELOPMENT IN SCHOOL EDUCATION

After the formation of the Directorate of School Education as a separate department, the phenomenal quantitative development that has taken place in the field of School Education can be seen from the following :—

Out of a total education budget a sum of Rs. 94.10 crores is meant for School Education Department. In addition to this, provision under the capital budget is also made for the construction of school buildings.

To cope with the taste of increasing expansion of Education the administrative set up of the Department at the District level was reorganised in 1968—69 and the number of District Educational Offi-

cers at the educational district level, the Chief Educational Officers at the Revenue District level and the Deputy Inspectors of Schools at the Range level in 1973—74 is given in the statement below.

Further it is proposed to appoint during 1974—75, additionally 15 Deputy Inspectors of Schools and one Chief Educational Officer with supporting staff and 2 Regional Inspectors of Physical Education. The cost involved will be Rs. 3.30 lakhs.

CONTINUOUS INCREASE IN ENROLMENT

There has been continuous increase in the percentage of enrolment. It is proposed during 1974—75, to enrol additionally two lakhs of pupils under the age-group 6—11 and to appoint 4,700 secondary grade teachers to cope with additional enrolment as well as for qualitative improvement. Similarly 1 lakh of pupils is to be enrolled under the age-group 11—14 and 2,850 Secondary Grade Teachers are to be appointed. Further it is also proposed to provide for contingencies, etc., at the rate of Rs. 5 p.m. per teacher and to give an equipment grant of Rs. 500 per teacher for about 2,170 teachers.

To promote Physical Education activities in Middle Schools, it is proposed to introduce in 1974—75, a scheme for the appointment of 200 Physical Education Teachers additionally and to give grant at Rs. 400 per school towards purchasing the sports articles. Hence a sum of Rs. 5.70 lakhs is provided in the Budget.

JAYANTHI VILLAGE SMALL SAVINGS

Special Drive for Small Savings Collection was conducted in Ramana-thapuram District from 16-2-1974 to 22-3-74. The collection made during the drive period exceeded the target fixed by the Government.

	Rs.
Target ..	72,65,000/-
Achievement ..	75,03,611/-

Kovilangulam village of Aruppukottai Panchayat Union has been declared as a Jayanthi Village under Small Savings Scheme. All the 742 Families of this village have been brought under this scheme. The villagers have deposited a sum of Rs. 41,265 during the drive period.

TEACHERS IN AIDED SCHOOLS

DISTINCTION OF TAMIL NADU

Unlike many other States, in Tamil Nadu, the State Government bear the entire expenditure on the emoluments of the teachers in aided schools also. The expenditure on salaries of teachers in all the schools in the State has gone up from about Rs. 55 crores in 1970—71 to about Rs. 80 crores in 1974—75.

The Tamil Nadu Private Schools Regulation Bill which has been passed by the State Legislature last year and is awaiting the concurrence of the President will provide statutory protection for the service conditions of aided school teachers and will at the same time encourage private managements to run their schools efficiently.

The Pension Rules for teachers in non-Government service have been successively liberalised during the last few years and Tamil Nadu is perhaps the first State to achieve parity in retirement benefits between teachers in Government and non-Government service. The teachers in aided schools have also been allowed the same leave benefits as teachers in Government service including the privilege of encashing the leave.

EXAMINATION (REFORM IN SCHOOLS)

A State Evaluation Unit was set up in 1972—73 to study the problems of improvement in methods of educational evaluation. The scheme of internal assessment of the total personality of the children which has been introduced as a Pilot Project in the 10th Standard in 250 selected Secondary Schools in 73—74 will be continued in 74—75 also to gain experience in working the scheme.

GROWTH POVERTY AND UNEMPLOYMENT IN TAMIL NADU

INCOME DISTRIBUTION AND INCOME INEQUALITY

A nation's prosperity may, to some extent, be judged by its national income which is nothing but the sum total of the values of the goods produced and the services rendered. The position of our country, India, is known when we know that the average income per individual in India is only 2.3% of that of U.S.A.

This income is distributed among people; after all, this income is generated by people. The way in which the income is distributed is called income distribution. If an individual's income is more he is called a rich man. In Tamil Nadu if we arrange the people according to their income in the increasing order, we observe that the rich 30 per cent of the people get 63.5 per cent of the total income and poor 30% get only 11% of the total income. Subdividing further the rich

The way in which the total consumer expenditure is distributed among people is called consumer expenditure distribution. A rough analysis of this distribution for Tamil Nadu shows that top (rich) 30% of the people spend 52.5% of the total consumer expenditure whereas the bottom (poor) 30% spend only 14.5% of the total expenditure. On comparing such distributions at two points of time *i.e.*, at 1964 and at 1970 it is quite surprising to see that there is not even a slight change in these figures. This inequality *i.e.*, minority rich people consuming more and the majority poor people consuming less remains the same for the past twenty years for all India also.

Extent of Poverty :

For the purpose of assessing the magnitude of poverty among people, poverty level has to be defined in terms of minimal level of consump-

"With you can measure what you are speaking about and express it in numbers, you know something about it, but when you cannot express it in numbers, your knowledge is of a meagre and unsatisfactory kind."—So observed Lord Kerlin some years ago.

With this in mind, the concepts of growth, poverty and unemployment have been quantified and given in this article in a popular style.

10% get about 42% of the total income. Such inequality *i.e.*, lesser people getting more income and more people getting lesser income is to be reduced. What we aspire for is to produce more *i.e.*, generate more income and to see that all sections get their due share. This is what is called 'growth with social justice.'

Expenditure distribution, inequality and stagnation :

In the total income, a portion is being spent by the Government on administration and social consumption such as health and education. A sizable portion is being spent by people on their food, clothing, shelter and other items. This is called private consumption expenditure. The general level of living of a person may be judged by the amount he spends on private consumer expenditure. If a person spends more, we say his level of living is high and he leads a comfortable life.

tion. It is considered that the private consumption of Rs. 40 per month per individual is the minimum desirable consumption standard *i.e.*, for a family of five members, a minimum of Rs. 200 is required for spending on the minimum necessities. An elementary analysis of the expenditure distribution shows that 50 per cent of people of Tamil Nadu are below poverty line at present and this has been 54 in the year 1963-64 and 52.5% in the year 1969-70. Now there are about 22 million people in Tamil Nadu who are not able to spend even Rs. 40 per month on necessary items such as food, clothing and shelter etc.

Unemployment :

We know from 1971 census, that the population of Tamil Nadu is 4.12 crores. A detailed demographic study of Tamil Nadu points out the fact that we have to provide jobs for two persons in a family of five on the average. Thus we have to provide jobs for 40% of the

By

Dr. V. SOUNDARARAJAN.

above population *i.e.*, for 16.4 million persons. This means that for keeping all those available for jobs on work, the total number of jobs in the economy should be 16.4 millions.

There are jobs held already by people which can easily be assessed.

According to 1971 census the total number of workers is 14.7 millions. When adjusted for seasonal employment and jobs held by children we find that only 85% of these correspond to full jobs, *i.e.*, in 1971, the already available jobs numbered 12.5 millions. But full job is meant a job of six to eight hours duration in a day and to last for 280 to 300 days in a year. The difference between the jobs required and the jobs available is the unemployment which is about 4 millions. This figure when updated to 1974 works out to 4.7 millions. If we allow a certain percentage for frictional employment, we need about 42 lakh jobs in Tamil Nadu to engage all those who desire to work. This may appear to be an exaggerated figure ; but this is the reality.

Prof. Dudley Seers of the University of Sussex, says that development means creating conditions for the realisation of human personality and this cannot be measured by national income. His view is that evaluation of economic development has to take into account three linked economic criteria : whether there has been reduction in

- (a) Poverty,
- (b) Unemployment and
- (c) Inequality.

If there is an improvement in all these, there is a development .

Development Plan

A development plan for a nation or for a region should solve the problem confronting it. As far as Tamil Nadu is concerned we have the problems of unemployment and poverty. The plan which we formulate should provide full employment for our people and to increase the general level of living of the common man.

The level of living of people can be raised only if we increase the income and follow suitable strategies which enable all the unemployed persons to get jobs with reasonable income and the pattern of production is such that the goods required, specially consumption goods required by people, are produce adequately.

In this context it is worth noting that the State Planning Commission in its Perspective Plan Frame for Tamil Nadu for 1972—84 has suggested that the average income per individual (per capita income) of 1971 is to be doubled in the year, 1984. It is clear that generating sufficient income is a necessary condition but not a sufficient one for facing the problems. For this, the production structure should be such that it produces enough consumer goods so as to avoid price rise and produces enough jobs. Assuming that such production structure takes place we shall visualise the future.

Visualising the future :

The per capita income of Tamil Nadu in 1971 is Rs. 654 (at 70—71 prices) and if this is to be doubled in 1984, it should be 1308 in 1984. As the population of Tamil Nadu is expected to be 5.37 crores in 1984 its income in 1984 should be Rs. 7024 crores.

At present the private consumption expenditure in Tamil Nadu is 77.7 per cent of our income. This may be assumed to the same in 1984 or it may, at best, be reduced to 75%.

As it is not possible to assess the pattern of expenditure distribution in future, let us assume the same structure as the distribution of 1970 which would be the likely situation if we are to rely on the past trend. On this assumption the percentage of people below the poverty line would be about 30% in 1979 and 10% in 1984. Thus in 1984 we see that only 10% of the people will be below the poverty line and they may very well be disabled persons, destitutes, pensioners and others who are not in the stream of economic activity. Their income and living standards cannot be expected to rise with the growth of the economy in the absence of special assistance.

The number of workers in 1971 is 14.7 millions and the State income is Rs. 2,687 crores. Hence the average income per worker is Rs. 1,822. This, due to scientific development and technological improvement, is expected to rise to Rs. 2,892 in 1984. Hence for the envisaged income 1984, the number of jobs available and the number of jobs required have been calculated and given below :

We observe that in 1983—84, we may require only about 9 lakhs jobs to keep the entire labour force engaged in gainful employment. The gap of 9 lakhs may be accounted for by frictional employment and hence there will not be any unemployment in 1983—84.

Thus if the per capita income is doubled as expected and if the production structure is suitably framed we will see the smiling face of the 'Common Man.' Let us hope for the best.

		No. of jobs available (in crores)	No. of jobs required (in crores)	Unemployment (in crores)
1970—71	..	1.2479	1.6441	0.3962
1973—74	..	1.2839	1.7615	0.4776
1983—84	..	2.0560	2.1476	0.0916

OCCUPATIONAL

Information and its Importance

The purpose of Occupational Information run by the Directorate of Employment and Training, is to provide through its job analysis an appreciation of the fundamental structure of jobs and the basic approach to occupational research and to illustrate the principal forms of occupational information pertinent to employment service operations. Job analysis is the systematic examination of a job to identify the scope, purpose and nature of the work performed and to determine the skills, knowledge and abilities which enable the worker to discharge his responsibilities for the accomplishment of the duties and tasks of which the job is composed. Since job analysis is concerned with identifying the qualifications required for the individual to perform the work to be done on a job, it provides the kind of information required to achieve a balance between labour supply and demand at the level of basic components of the occupational mosaic. Consequently job analysis represents the most minute aspect of employment market analysis. The importance of the occupational research programme is therefore immense in Vocational Guidance Programme for its success. The programme forms the basis of all employment service operations and it is the medium used by other agencies involved in labour studies, labour management manpower planning etc. as well.

INFORMATION PROGRAMME

The Occupational Information Programme of the National Employment Service is designed to serve various purposes in man power planning, employment placement and vocational guidance. **Publications under this programme can be categorised into, information pertaining to occupations ; educational and training institutions and qualifications ; employment outlook jobs and vacancies ; and other related matters bearing on single occupation or occupational groups or related specific educational levels.** The publications so far brought out include the National Classification of Occupations ; Handbook on Training

Facilities, Directory of Qualifications recognised by the Government of India, Educational and Training requirements of production process workers ; bulletins on job opportunities, occupational specifications, interview aids ; Employment outlook series ; Career pamphlets, Occupational field reviews, occupational information series, Vocational Adjustment Series and World of Work Series. Apart from the above, at the State level, Occupational Outlooks, Career Bulletins, Career Literature Series ; and translations of guides to career are issued. At the State level again, special and kadh industry occupation surveys to assess the employment cum occupational potential of specific industries as also to assess the occupational pattern, are undertaken.

ITS PLACE IN BUSINESS AND INDUSTRY

In recent years, business and industry have greatly expanded their development and use of occupational information. Since the post-war years it is being increasingly used in employee selection, in evaluating jobs, in merit-rating in assessing skills, in comparing job contents, in determining lay-offs, and in transferring workers to new jobs with a minimum loss of skill. In an ever-changing an unsettled world, industry must be quick to switch over to new products and services. There is again the problem of technological change whereby the content of jobs must reflect new processes, new machines, and new products and services. Industrial training has occupational information as its foundation. Collective bargaining agreements contain much occupational information. Many contain provisions requiring accurate and up-to-date descriptions of jobs by the employer.

NATIONAL EMPLOYMENT SERVICE AND THE OCCUPATIONAL INFORMATION

The National Employment Service operations revolve round the pivot of occupational information. It is the basis for registration of job

seekers, for documentation of vacancies, for placement, for vocational guidance and for employment market information. The data collected by this Department is also used by other agencies like the National Sample Survey, the Census Organisation, the Labour Bureau, the Statistics Department, the Wage Boards, etc.

I. L. O. AND THE OCCUPATIONAL INFORMATION

The informational aspects of occupational information have been given considerable attention by the Governments of the world. Occupational and industrial classifications are of particular interest in order that census data and other occupational materials may be more easily understood and interpreted. The International Labour Organisation has emphasized vocational guidance and occupational classification, and has adopted recommendations which point out the use of occupational information.

World War II witnessed a vast improvement in the development and use of occupational information by the armed forces. During demobilization, again, occupational information, was used to provide advice to the members of the armed services.

The educational institutions of a country have great use for occupational information in individual and group educational and vocational counselling and in planning and establishing new and revised courses of study.

Perhaps the greatest use of occupational information is to counsellors and guidance workers, whether in educational institutions or in Employment Service. Their entire programme hinges very heavily on the availability of up-to-date, accurate and comprehensive occupational information. They use it in every aspect of their work—interviewing, individual guidance, group guidance, career talks, career conferences, career seminars, career exhibitions, visits of industry, courses in occupations etc.

Occupational Information plays a vital role in the planning and execution of community programmes dealing with the occupational adjustment of its citizens.

Occupational Information is very important for man power planning and man power development. In fact, industry occupation matrices are constructed to determine the manpower requirements of the industry by occupations. And it is through a consolidation of the individual occupational outlooks that a superstructure of general manpower forecasting is attempted for the economy.

In the rehabilitation of the handicapped, occupational information plays a vital role. In this process, the residual physical abilities of the person are first assessed and then it is matched with the performance requirements of various jobs. In this matching, certain adjustments are made both to the ability patterns of individuals as also the performance side of jobs. In the former case it is done through prosthesis and in the latter, it is done through job-engineering. All this presupposes detailed job analysis, especially, a thorough analysis of the physical demands involved in the performance of jobs.

This listing of uses can go on and on as the subject matter is of such vital importance and has, as already mentioned in the beginning, inextricably woven itself into the very fabric of the human society. What is important to bear in mind is that when one has obtained the original data about occupations, he must place his findings in usable form for practical use depending upon the actual needs.

* * * *

PRIVATE WEEKLY MARKETS TO BE TAKEN OVER BY PANCHAYATS,

A NEW STEP TOWARDS SOCIALISM TAKEN BY TAMIL NADU GOVERNMENT.

The Administrative Reforms Commission has recommended, *inter alia*, that the Panchayat Unions

may be allowed to acquire private weekly trade fairs (Shandies) and run them directly for the following reasons :

(i) In many villages, private individuals take on lease from the Government or local bodies, large extent of poramboke lands on which they conduct weekly village trade fairs and derive sizeable incomes.

(ii) If the Panchayat Unions take over such lands and run the fairs themselves directly or in the alternative if they sell the right to run the fairs in open auction they will be able to improve their finances appreciably.

The Officers' Level Committee, at its meeting held on 22—9—1973, considered the above recommendation and decided as follows :

“There are enough provisions in the Tamil Nadu Panchayats Act, 1958 for the acquisition of private markets and in the rules for the proper enforcement of regulations to govern them. The acquisition of private weekly village trade fairs (Shandies) particularly communal markets will lead to legal complications. Panchayat Unions may therefore be allowed to acquire such markets wherever possible.”

The Government accept the recommendation of the Officers Level Committee and direct that, in view of the provisions already available in Section 105 of the Tamil Nadu Panchayats Act, 1958, the Panchayat Unions be allowed to acquire such private markets wherever possible. The Director of Rural Development is requested to issue suitable instructions in this regard to all Panchayat Unions.

* * * *

USE OF RAILWAY CESS FUND FOR THE IMPROVEMENT OF ROADS IN THANJAVUR DISTRICT.

Thanjavur, being a deltaic district criss-crossed by a very large number of irrigation channels, several villages become totally inaccessible

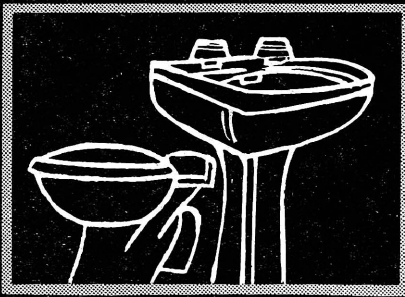
during the rainy season between September and January. These months are the months when the inputs for agriculture have to be transported to the villages. They are also the months when kuruvai paddy which is the main marketable produce of the district has to be transported to the market centres for sale. So it was decided by the Government of Tamil Nadu to lay all-weather roads throughout Thanjavur District to make road communication, less burdensome and more accessible for all types of vehicles. In view of the special circumstances prevailing in Thanjavur District in the matter of communication the Government permit as a special case the use of the cash balance of Rs. 1.27 crores available under the Railway Cess Fund in the treasury for taking up the road works in Thanjavur so as to make improvements, construction of culverts and bridges in that District.

* * * *

CROWD CONTROL BY DELUGE

A NEW EXPERIMENT TRIED IN MADRAS CITY.

A new experiment in crowd control was recently tried in Madras by directing water jets from fire engines against unruly crowds and it proved quite successful. Thus the Fire Service can help in controlling crowds in a humane way eliminating lathi charges and other more violent methods of dispersal. The Fire Service have also been of use to the Traffic Police by clearing obstructions on roads like fallen trees, crashed vehicles and collapsed walls with the aid of a specially equipped breakdown van.

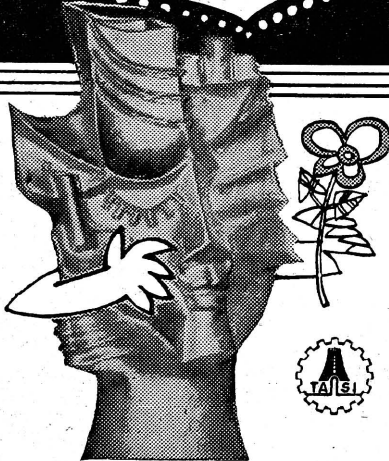


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The gap between educated persons and jobs has been a serious cause of concern to the educationists and the planners in India and other developing countries. The number of graduates seeking employment in India has gone up steadily. Their figures are revealing enough even though they do not include all those who are unemployed or underemployed because of reluctance on the part of many educated persons to register in the Government employment exchanges.

There are several reasons for this high figure of educated unemployment. The major cause obviously has been insufficient economic development so that sufficient number of jobs have not been created. A second reason is that proportionately there has been greater emphasis on higher education in the developing countries than on primary and secondary education.

WRONG PRIORITIES

This point has been underlined by a recent study brought out by Mark Blaugh on behalf of the International Labour Organisation office at Geneva. In this report it has been emphasised that not only higher education has been given disproportionate emphasis in the developing countries, the unit cost of higher education and secondary education as compared to primary education is far higher in the developing countries than in the developed ones.

For instance, whereas in the U.K. and the United States the unit cost on secondary education comes to 6.6 and on higher education at 17.6 as compared to one in the primary education, in the case of developing countries such as India, the cost on secondary education comes to 11.9 and on higher education at 87.9.

The implication is that the society is subsidising higher education at a far higher level in the developing countries than in the developed ones. This is one reason why there is such a rush for enrolment for higher education in these countries. This is what the ECAFE Report means by saying that there is an undue emphasis on formal, secondary education and that the unit cost is high to prepare young Asians for job or career qualification.

Several solutions have been put forward to meet the situation. One suggestion has been to restrict the expansion of higher education. However, in a country such as India, taking into account various factors, this hardly appears to be feasible. Even where jobs are not forthcoming for graduates, there has been a continuing rush for admission for university and college education on the part of those who have been denied access to higher education in the past.

HOW TO BRIDGE THE G A P BETWEEN EMPLOYMENT AND EDUCATION

The background for this is twofold. On the one hand, college degree is a status symbol, as much in a developing country as in a developed one. Secondly, all studies have revealed that while the social benefit of higher education may be low, its return to individuals in terms of earnings continues to be high as compared to those who have received only primary or secondary education.

OPEN UNIVERSITY CONCEPT

It has been suggested that roughly half of those who want to go in for higher education should be enrolled in not a formal institution of higher learning but provided facilities for part-time education or education through the medium of correspondence.

By
Dr. SATISH CHANDRA
Vice Chairman
U.G.C.

The experience of an Open University in Britain has shown that the unit cost in correspondence

courses is much lower than in a college or a university. On this point, there is little difference of opinion between the recommendation of the ECAFE Report and the thinking in Indian educational circles.

Vocationalisation means giving education for a concrete job, there has been a very high rate of obsolescence in such instruction in view of the rapid changes in technology. Secondly, there is a great shortage all over the world of such technologically competent people who can provide training to others.

The report of the ECAFE Panel, therefore, needs very careful consideration before we embark upon a large scale programme of vocationalisation. In any case, the question of vocationalisation is not relevant to higher education. In higher education, you can either have a professional training such as medical training, engineering training, legal education or you can have theoretical training in various disciplines.

What is really meant by vocationalisation is the attempt to provide middle level skills to people side by side with theoretical training. Even if the idea of vocational schools is accepted, it is clear that the number of people seeking jobs in the tertiary sector is so large that no programme of economic development and modernisation can hope to provide jobs for them.

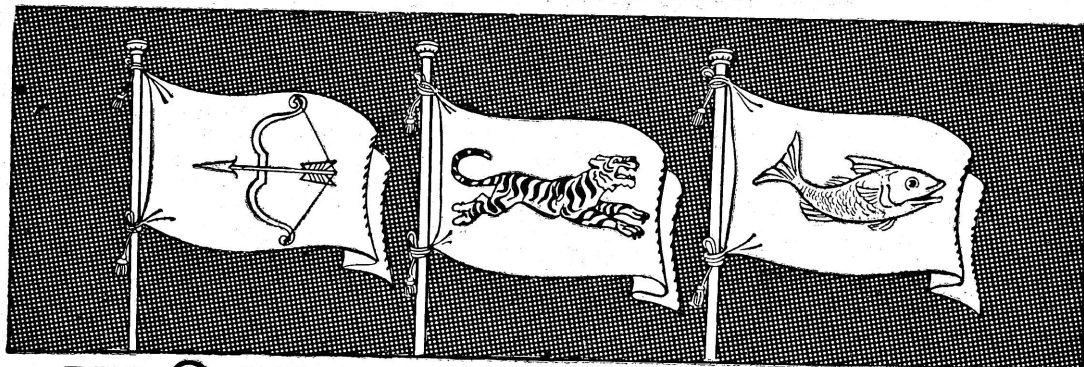
NEED FOR DIVERSIFICATION

This calls attention to the problem of orienting the educated youth to traditional employment such as jobs in the small and medium scale industry as well as in the agricultural sector.

The ECAFE Report seems to be relevant in this particular aspect. Attempts have been made in India recently to diversify education so as to take account of the needs of those who would be continued to be employed in these sectors, even after they have received higher education.

The University Grants Commission has set up a number of Committees to go into this matter in detail. The present thinking is that while the essential core of a discipline should not be tampered with or diluted, there is sufficient scope for diversifying what is supplementary or peripheral to it.

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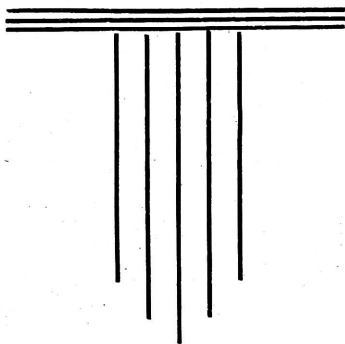
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STATE AND CENTRAL Government Schemes For Helping Qualified Unemployed



With the avowed object of providing relief to educated unemployed, a number of schemes have been formulated and implemented. These schemes provide facilities for training as well as assistance to educated unemployed in setting up Small Scale Industries Units thereby making them entrepreneurs and creating further employment opportunity.

The Directorate of Industries has taken up the task of co-ordinating the efforts to improve the climate for rapid industrialisation and employment generation. The idea is

to give package assistance to the prospective entrepreneurs. The Directorate is taking all possible steps to ensure that recipients of assistance under the Special Employment Schemes are enabled to commission their units with least possible delay. Assistance in respect of getting power connections, raw materials, working capital loans, Departmental and Municipal clearance, etc., is being rendered promptly and speedily on receipt of applications from the entrepreneurs. A sum of Rs. 3,55,200 was disbursed as margin money to 49 technically qualified engineers towards loan availed by them from various Commercial Banks and the Tamil Nadu Small Industries Development Corporation.

With a view to relieving unemployment among technically qualified persons, a special Apprenticeship Training Scheme was organised and a sum of Rs. 1.45 lakhs was provided in the Budget Estimate for 1973—1974 for this scheme. Under the scheme twenty-four degree holders and twenty-six diploma holders were given training in the Southern Structurals Limited and ten degree holders are being given training in the departmental units. The stipend for degree holders is Rs. 250 per mensem and for diploma holders Rs. 150 per mensem.

COMMERCIAL ESTATES

This scheme is designed to provide employment in semi urban areas and also at the growth centres developing in new industrial belts and "Green Revolution" areas. With this view 22 residence-cum-workshops have been constructed and allotted at the following Industrial Estates :—

Ambattur, Vyasarpadi, Madurai, Tiruchirappalli, Vellore, Karaikudi, Salem, Nagercoil, Thanjavur, Pettai and Vriddhachalam.

The idea of such an Estate is to build shopping-cum-residential blocks or work-cum-residential blocks consisting of shops in the ground floor with residential accommodation for the entrepreneurs on the first floor. The rents for these sheds are subsidised for an initial period of 3 to 5 years. These Commercial Estates are also expected to provide desirable service amenities to the local communities.

Twenty-four small workshops of 1,100 sq. ft. each were constructed in the Industrial Estates, Ambattur and allotted on rental basis to technically qualified persons. An expenditure of Rs. 4.35 lakhs was incurred.

On the whole, the implementation of the above State Government scheme during 1971—72 and 1972—73 has given scope for employment of 900 persons, and 228 persons in 1972—73, comprising of Degree Holders and Diploma Holders in Engineering Technology, skilled and unskilled workers.

THE CENTRAL SCHEMES

During the year 1972—73, a sum of Rs. 70.00 lakhs was made available by the Ministry of Industrial Development to implement various schemes for the creation of employment opportunities to educated persons. The amount was spent on the various schemes as below :—

TRAINING

Under this scheme educated unemployed persons are helped to get training facilities in firms for a period of one year. The intention is to improve the absorption potential of the trainees and to enable them to acquire sufficient experience to start industries of their own or seek employment with a better suitability. During the training period, stipend at the rate of Rs. 300 p.m. for Degree Holders in Engineering/Technology, Rs. 250 p.m. for Science Graduates and Post Graduates in Science and Rs. 150 p.m. for I.T.I. Certificate Holders is paid. Of the stipend mentioned above, 50 per cent is being borne by the Government and the other 50 per cent by the employer industries.

A total number of 286 Engineers (comprising 166 Degree holders and 120 Diploma Holders in Engineering/Technology) were given the benefit of training under this scheme in 94 institutions in both Public and Private Sectors. A sum of Rs. 79,543 was spent towards 50 per cent share of the Government in the stipend paid to these trainees.

INDUSTRIAL ESTATES

Construction of Industrial sheds of about 1,000 to 1,500 sq. ft. in the Industrial Estate at Ambattur, Coimbatore, Salem, Madurai, Ada-

yar and Guindy was taken up. Sixty sheds were constructed and all of them have been allotted. A sum of Rs. 44.18 lakhs was spent under this scheme. A portion of this amount was utilised by the Tamil Nadu Small Industries Development Corporation Limited, Madras for the Industrial Estates programme implemented by them during 1972—73 and continued in 73—74. About 300 persons start industries and provide jobs for as many as 3,000 persons.

MARGIN MONEY FOR HIRE PURCHASE OF MACHINERY

This scheme was implemented through the Tamil Nadu Small Industries Development Corporation Ltd., 418 Technocrats were assisted for the purchase of machinery on hire purchase basis involving a total expenditure of Rs. 19.70 lakhs.

On the whole, the implementation of the above scheme during 1972—73 has given scope for employment of 3,300 persons comprising Degree and Diploma Holders in Engineering/Technology skilled and unskilled workers.

The above Training Scheme implemented during 1972—73 is continued to be implemented during this year also, as "Subsidised Employment" Scheme. It is proposed to provide training facilities for a total number of 750 persons comprising of various categories of persons as detailed below :—

Degree Holders in Engineering/Technology—250

Diploma Holders in Engineering/Technology—300.

Post Graduates and Graduates in Science—100.

I.T.I. Certificate Holders—100

Total—750.

A sum of Rs. 10.58 lakhs was allotted for the implementation of the subsidised Employment Scheme during 1973—74.

Prospective entrepreneurs comprising of mechanical and electrical engineering have been sponsored for undergoing inplant training for a period of one year in the Central Institute of Plastic Engineering and Tools, Guindy, Madras 32 (CIPET). The trainees who number 11 at present are being paid stipend at

the rate of Rs. 400 p.m. the entire expenditure being borne by the State Government. On completion of training, they will be assisted to set up industrial units either individually or as a Co-operative enterprise.

TRAINING SCHEMES FOR PROSPECTIVE MEMBERS OF TECHNICIANS CO-OPERATIVES

A number of Special Training Programmes are also being organised for the educated unemployed with a view to equipping them suitably towards setting up industrial co-operatives. During the training period, the trainees are paid stipend at the following rates :—

Degree Holders in Engineering/Technology—Rs. 400.

Diploma Holders in Engineering/Technology—Rs. 250.

Science Graduates—Rs. 200.

I.T.I. Certificate Holders—Rs. 150

Matriculates of S.C./S.T.—Rs. 100

The entire training expenditure is borne from the funds provided under Half-a-million Jobs Programme. For the year 1973—74, a sum of Rs. 10 lakhs has been allotted for implementation of various schemes under this head.

PLANTATION SCHEMES FOR UNEMPLOYED GRADUATES

A scheme for giving training to 50 undergraduates and 25 Graduates in Mulberry Plantation and Silk reeling is being implemented. This scheme involves an expenditure of Rs. 50,300.

A scheme for giving training to 90 candidates including 15 Agriculture Graduates to be employed for giving extension service facilities to Small Tea Growers in the Nilgiris district is being implemented, the expenditure involved being Rs. 96,600.

Scheme for training candidates to be recruited for the vacancies to the posts of Supervisors of Industrial Co-operatives, Assistant Supervisors of Industrial Co-operative Societies, clerks and Accountants involving an expenditure of Rupees 2,38,500 is being implemented. Fifty Graduates and 100 under-Graduates will be benefited under this Scheme.

In 1973—74, it has been proposed to form at least 25 Industrial Co-

operative Societies for various services and products. Six of these have already been registered and the others are under various stages of organisation. The Industrial Co-operatives are expected to provide employment to nearly 700 technical persons, besides an equal number of skilled and unskilled workers. Organisation of Industrial Co-operative Societies for the benefit of educated women in the districts is also being planned.

TECHNICAL CO-OPERATIVES

Since it would be difficult for unemployed technicians to contribute substantially to the share capital structure of the Society, the Department of Industries and Commerce advances personal loans to the Members out of the funds allocated under State Aid to Industries to enable them to contribute the above loan towards the share capital of the Society. Some of the nationalised banks are also being approached for extending this loan assistance to the members of the technicians' co-operatives. The personal loans advanced to the members are recovered in easy instalments over a period of five years after regular commencement of work in the societies.

In addition to this, the State Government also participates in the share capital structure of the society to the extent of three times the members' contribution to the share capital of the society. The working capital requirements for these societies are normally obtained from various Nationalised Banks and Tamil Nadu State Industrial Co-operative Bank.

A sum of Rs. 18.00 lakhs has been set apart for the year 1973—74 for this scheme of equity participation.

ROLE OF SIDCO

Under the scheme for assisting the educated unemployed, a sum of Rs. 13.40 lakhs has been sanctioned to the SIDCO during 1973—74 for construction of new workshops in the Industrial Estates for letting out to unemployed Engineers. Under the scheme to assist the educated unemployed under the Half-a-Million jobs programme another sum of Rs. 66.00 lakhs (loan of Rs. 61 lakhs and a grant of Rs. 5 lakhs) has also been sanctioned to SIDCO for 1973—74.

The following statement shows the achievements under the above schemes during 1971—72 to 1973—74 :—

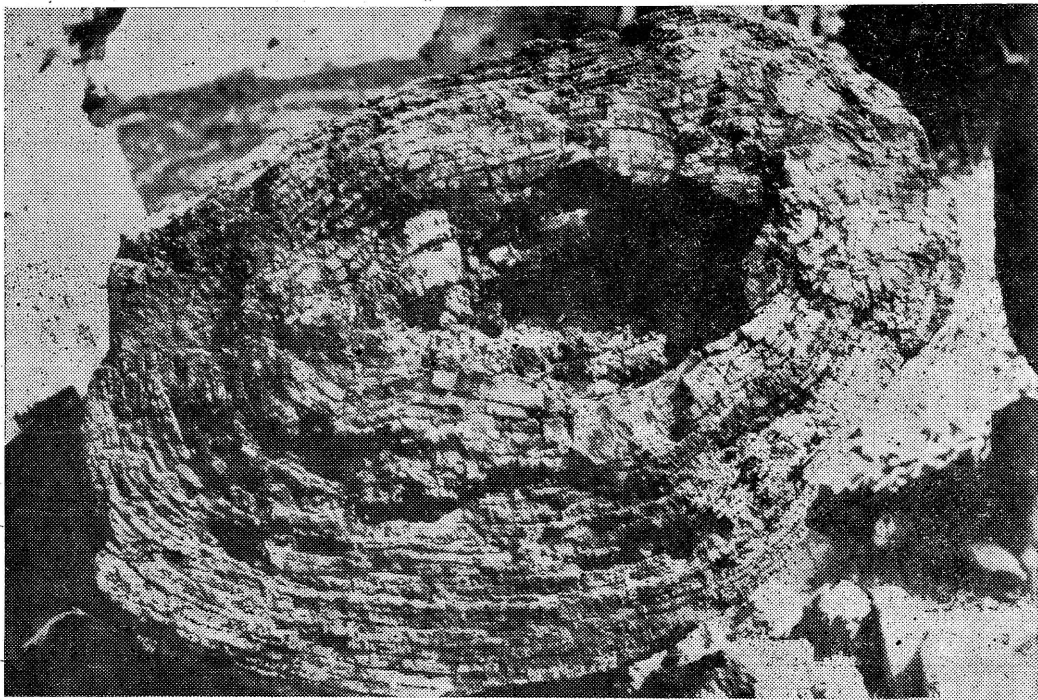
EDUCATED UNEMPLOYED

	1971—72		1972—73		1973—74	
	<i>Number of persons benefited</i>	<i>Amount Spent</i>	<i>Number of Persons benefited</i>	<i>Amount spent</i>	<i>Number of persons benefited</i>	<i>Amount spent</i>
	(Rs. in lakhs)		(Rs in lakhs)		(Rs. in lakhs)	
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1. Margin money ..	49	3.55	418	19.70	..	..
2. Equity participation in Industrial Co-operative Societies ..	228	2.00	228	5.19	700	18.00
3. Industrial Estates ..	22 (work sheds)	4.35	..	44.18	60 (sheds)	17.00
						13.40 thro. SIDCO
4. Hire Purchase of Machinery ..	900	38.00	..	..	..	..
5. Training Programme ..	..	..	286	0.79	(Shown under Half-a-Million job programme.)	
		48.00		69.86		48.40

HALF-A-MILLION JOBS PROGRAMME

(1)	1973—74	
	<i>Number of persons to be benefited</i>	<i>Amount spent</i>
	(2)	(3) (Rs. in lakhs)
1. Subsidised Employment Programme ..	750	10.58
2. Training in—		
(i) Sericulture ..	75	0.34
(ii) Tea Industry ..	90	0.61
(iii) Co-operative Management ..	150	1.01
(iv) Industrial Co-operative Societies ..	505	2.10
3. Loans and grants to SIDCO (towards seed money, margin money and feasibility reports) ..	..	66.00
	Total ..	80.64

TAMIL NADU CREATES FIRST NATIONAL PARK FOR FOSSIL WOOD



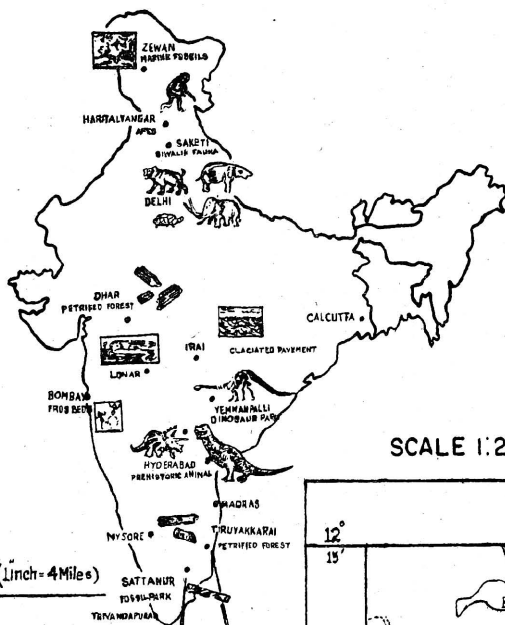
In India, there are a number of natural monuments like the one near Saketi, Himachal Pradesh, where skeletal remains of extinct mammals and reptiles are preserved; the Dinosaur Park at Yemmnappalli in Andhra Pradesh where bones of gigantic herbivorous and carnivorous animals have been unearthed; the Frog Beds of Worli Hills, Bombay; and the fossil wood parks near Sattanur, Tiruchirapalli district and Tiruvakkara, South Arcot district, Tamil Nadu. Quite a few of them are of interest not only to students of geology but also to the general public. Such gifts of nature richly deserve to be safeguarded and protected for posterity. The Geological Survey of India has been actively engaged in the task and in 1951, action was initiated

in setting up fossil parks in Tiruvakkara and Sattanur. With the active help and co-operation of the Government of Tamil Nadu, who donated the fossil-bearing areas in both the localities to the Government of India, barbed wire fencings were erected by the Geological Survey of India and the **First National Fossil Wood Parks in the country came into being.**

At Sattanur, a petrified tree trunk, 19.51 m. in length and with a maximum girth of 1.37 m. is embedded in sandstones of the Cretaceous age (100 million years). Originally it should have measured about 62 m. in length, as is evident from markings. Similar fossil tree trunks, measuring a few metres in length are traced along stream sections near Varagur, Anaipadi, Alundalipur and Sarada

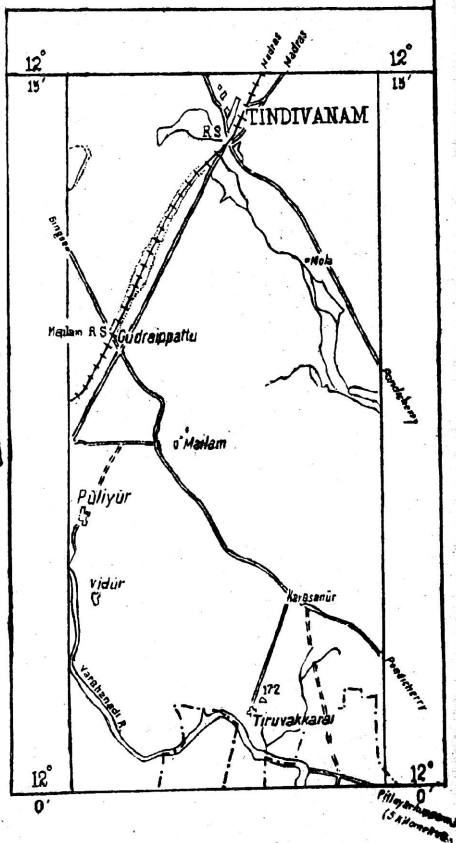
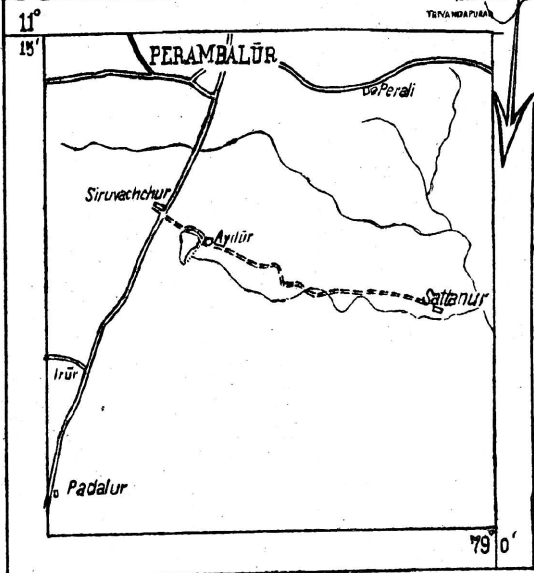
mangalam in the same area. Tiruvakkara has double attractions for tourists and visitors, by way of the Chandramouliswara temple of architectural grandeur, built by the Chola rulers and the spectacular fossil wood tree trunks, exposed to view by the handwork of nature. The fossil tree trunks, lying scattered on low mounds and stream sections have long been interwoven with mythology and according to local legend are the bones of a demon slain by Lord Vishnu. In fact, the fossil tree trunks do look like bleached bones. Mythology apart, it is interesting to note that even before the advent of the Scientific Age, the ancients had recognised that the fossils were unique and different from the rest of the rocks in which they occur.

MAP SHOWING FOSSIL LOCALITIES AND FOSSIL PARK



SCALE 1:253,440 (1"=4 miles)

SCALE 1: 253,440 (1 inch = 4 Miles)



FOSSILS POINT TO NEW THEORY OF EAST COAST TOPOGRAPHY

Even as far back as 1780, Mr. M. Sonnerat, an European naturalist who toured the eastern coast, wrote an account of the magnificent fossil finds. Subsequently, geological studies helped in the recognition of varied rock types and in the identification of the fossils. Dr. Birpal Sahni, an eminent scientist, identified species of *Mesembrioxylon Schmidannum* of the Coniferous Group and *Palmoxylon Pondicherriensis* of the Palm Group. Some of the fossil specimens resemble *leguminosae* (pulses family), *guttiferae* (punnai family), *celastraceae* and *Euphorbiaceae* and the familiar tamarind tree, suggestive of the existence of these species in the pre-historic past also. As a result of the studies, the fossils have been dated and are estimated to be 20 million years old, belonging to the Miocene age according to the geologist. It is unbelievable to the common man as to how trees of such great antiquity could be preserved for millions of years and to understand this, a background of the palaeogeography of this part of the eastern coast of the country will be of help.

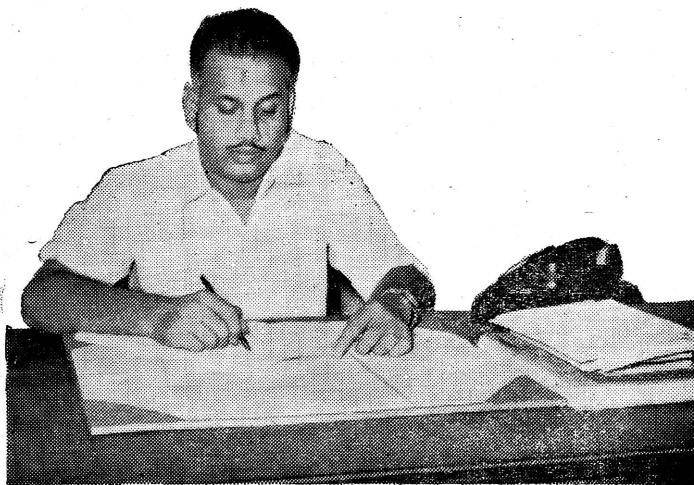
Geologists have traced sedimentary rocks — rocks mostly formed by deposition of sand and clay by water action — along the eastern coast from near Pondicherry in the north to Tuticorin in the south.

This would necessarily mean that this strip of land was the location where rivers discharged their waters into the sea. The angular and rough nature of the sand grains of the sandstones indicate that the streams and rivers deposited their load of sediments after short runs. The association of fossil wood with the sandstones suggests that originally logs of wood were transported by streams and rivers from mountains and deposited in sea along with sand. The absence of roots, barks and branches in the fossil wood lends support to this view. Petrification of the original logs had obviously resulted by the replacement of woody cellular matter by silica, atom by atom. In this context, it is underlined that had the logs been dumped in swampy waters, quick bacterial action would have carbonised the organic matter. Undoubtedly, this long-drawn out process of petrification was responsible for the remarkable retention of the anatomical and structural details of wood in spite of the complete conversion of wood into stone. The presence of fossil wood of coniferous which grow at altitudes of about 800 metres and above only, is of critical importance in that it points to the configuration of the topography of the eastern coast. Ostensibly, here along the eastern coast, luxuriant vegetation including

conifers should have proliferated on high hills. Subsequently, the high hills were subjected to the relentless erosive forces of nature and the hills now traced along the eastern coast may well be remnants.

The magnificent fossil tree trunks of Tiruvakkarai, exposed to view by erosion are also remnants, but remnants of great value to be zealously guarded so that they may be seen, admired and studied by generations to come. Apart from those already fenced in, there are a number of other fossil wood occurrences near Tiruvakkarai. It is proposed to take up suitable measures to protect them also with the help of the Government of Tamil Nadu. Natural monuments are not always easily accessible, but, Tiruvakkarai with its centuries old temple and still older fossil trees is easily reached by a motorable road, branching off from the Tindivanam—Pondicherry road. It may not be too much to expect that before long Tiruvakkarai will find a place not only in the Tourist Map of Tamil Nadu but that of the country and attract more visitors.

Source : Geological Survey of India, Tamil Nadu Circle.



Ph. D. SECURED BY NAGARAJAN, M.L.A.

The Madras University conferred the coveted Ph. D. on Thiru K. Nagarajan, M.Sc., M.L.A., for a thesis on the Caterpillar. The studious traits and talents of Thiru Nagarajan get emphasised when we remember that he has accomplished his literary tour de force without compromising his obligations to his constituency of Vadamadurai and the numerous calls on his time for public causes and personal advancement.

Thiru K. Nagarajan, after completing his M.Sc., had put in some years service as Assistant Professor. He contested the 1971 General Election successfully at Vadamadurai. He secured his Ph. D. for his thesis on "Hisdochemical and Physiological studies on the gut-lining of some Arthropods".

Do Plants Have Emotions?

Innumerable experiments have confirmed that live plants which are in close proximity to a person respond to his joy, delight, fear and anger—to all outbursts of emotions which are quite natural even though provoked artificially by suggestion.

It might seem odd that the instrument which the Moscow psychologists employed in their experiments—the encephalograph designed to register phenomena accompanying the activity of the brain—should have been used on a plant.

In 1953 Professor Isidor Gunar, an outstanding Soviet biologist, set up at the Timiryazev Agricultural Academy a group for the study of plant irritability under Alexei Sinyukhin, a young, promising scientist. In the early stages the researchers found themselves swamped in a bog of questions. How does the plant react to irritants?

The signal from the irritated cell to the performing one could be transmitted. The signal could travel together with changes in electric potential in about the same way as in animals. But animals have nerves. Along such "telephone wires" information spreads fast though not instantaneously. It is not borne by a flow of electrons, as in a metal conductor, but by a wave of ion-charged particles which emerge in solutions.

Signalisation System

Common origin and Common laws of evolution suggested that plants in all likelihood employ a signalisation system which is similar to that of the animal. But that was in theory.

The initial experiments seemed promising: Sinyukhin's group appeared to be on the right track. The moment the plant's roots were placed in a dilute solution of table salt the self-recorder's sensor, which was fixed on its talk, registered a sharply growing difference in potentials.

Later it became clear that changes in electric potential actually did spread along a semblance of a tele-

phone cable—a bundle of fibres which conducted plant juices. True much more slowly than along nerves, but what was important was that the mechanism was similar. In 1970, Sinyukhin staged a crucial experiment.

"Language" of Plant Cells

Two plants are linked by special electronic instruments. When one is irritated both react, and react in identical ways as if they comprised one whole, like Siamese twins. But the link between them is not physical. It is a "telephone" link! It does not transmit irritation, but information about it, or in other words, fluctuations of action potentials. Does this mean the latter really have information vital to the plant coded in them?

GRIGORI POLUNOV

Do plants really have something analogous to the nervous system? Perhaps they merely appear to be insensitive to the axe and the scythe? And only because we do not suspect that they "cry"? Mimosa is called "sensitive" because it shrinks in response to the gentlest touch. And the dewplant immediately spots "by touch" an insect which inadvertently alights on it. It captures its prey with the aid of special motor devices.

These are examples of tactile sensations. Plants can also be said to have an "ear": they react to music (more exactly, to rhythmic vibrations caused by a nearby source of sound oscillations). "Vision": many flowers open their corollas under the impact of the sun's rays and turn to follow the sun. Of course, all such metaphors are questionable. But whatever the case may be, plants, which have no sense organs, perceive the same irritants as animals.

The analogy with the animal world appears to be so obvious:

It is all so like the simple reflexes of animals in response to external irritants! But are they so simple, these plant "reflexes"?

Back in the 1920s, Alexander Gurvich, a Soviet scientist, observed an amazing phenomenon. By gradually reducing the cells of plants which found themselves in direct proximity to each other for some reason divided faster. Further investigations—with yeast, cells of muscles, the heart and the liver—led to what appeared to be an incredible conclusion: live tissue is capable of emitting ultraviolet radiation. It is weak but perceptible, being easily registered by sensitive instruments.

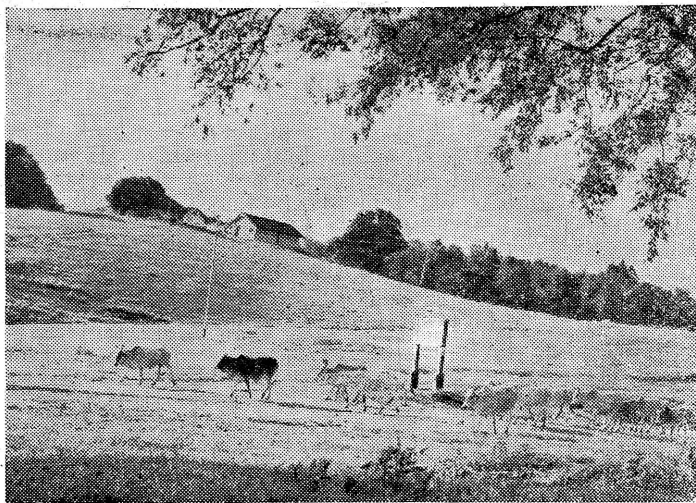
Particular Value

Perhaps it is too early to claim the results of the recent experiment as a discovery. It is a hypothesis, it may be said. But some conclusions already seem obvious. Most important, if a live plant reacts to processes that take place in man's nervous system, there must be something in common between vegetable and nerve cells, which are so vastly different. Possibly, they 'communicate' in kindred languages.

By registering the reactions of our green friend to adverse changes in the environment, instruments can notify people and controlling automats of the need for assistance, that conditions need improving. It will become easier to preserve forests, orchards, parks, to replenish timber resources on felling tracts and to raise the yield of farm crops.

Such self-regulation is of particular value for plant cultivation in outer space, which will pose the problem of rapid adaptation to conditions dissimilar to those on earth. Man will be prepared for mutual understanding with such totally new beings by the new trend in plant electrophysiology which has been developed by researchers in different fields in the Soviet Union.





The Anaimalai Wild Life Sanctuary is one year old ; it lies mostly in Coimbatore District and partly in Madurai District and is the largest of its kind in Tamil Nadu. As the past systems of management were confined only to exploitation and regeneration, no thought was given for scientific management of fauna. As a result, there was considerable reduction of Wild Life in this division. Therefore, a complete ban on shooting of Wild Life has been imposed in Tunacadavu Range since 1957. Not content with this ever since, 1963, the entire Coimbatore South Division has been closed to shooting. Subsequently steps were taken in 1971 to constitute the Anaimalai Wild Life Sanctuary and eventually this was inaugurated on 21st January, 1973.

This sanctuary is situated in the Western Ghats, with an area of 900 square kilometres. Thanks to the gifts of nature this sanctuary possesses different types of forests starting from plain thorn forests to temperate forests of high elevation to make the entire Anaimalai Hills a vast panorama of scenic wonder, providing abodes for different species of wild life at different altitudes. The main forest types to be found in this Sanctuary are namely Southern cutch thorn forest, Southern tropical dry deciduous forest, Dry Savannah, forest, Southern tropical moist deciduous forest, Southern moist bamboo brakes, Southern tropical wet evergreen forest, Southern wet bamboo brakes, Nilgiri Sub-tropical evergreen forest and Southern wet temperate forest. This rich variety of forest types in a single sanctuary

will speak volumes about plant life to be found here.

The Anaimalai Sanctuary exhibits also a rich and varied fauna (wild life) and most of the South Indian species are well represented. Elephants, Tigers, Panthers, the sloth bears, Gaurs, Nilgiri Wild Goats (Nilgiri Tahr), Deer, Wild boars, Wild dogs, Brown flying squirrels, the Nilgiri langurs, the Indian porcupines, the Black-naped hares etc., are observed. Among snakes mention may be made of the Cobra, the hamadryad, the keeled Viper etc. Besides, the Sanctuary contains equally rich and varied avifauna and variety of fishes in the reservoirs.

LOOK FOR THESE HAUNTS

The tourists can look for the important haunts viz., the Wood House Lawn, Topslip-Sungam Ghat road, Topslip-Ulundy Valley road, Seechali road, Chinnar Extension road, Pandaravarai, Perunkundru, Grass Hills, Anaikunthi shola for observing wild life. This Sanctuary abounds in scenic spots viz., Karian-shola, Anaikunthi shola, Grass Hills, many water falls, wood's grave, the Centenarian (1872) teak plantation supposed to be the oldest of its kind, Panchalingam, many dams and reservoirs. There is a net-work of good roads of which some are fair weather roads. There are accommodations available in and around the sanctuary. **The State Wild Life Officer at Madras and the District Forest Officer, Coimbatore South Division at Pollachi ad-**

By R. K. PONNUSWAMY, I.F.S.,
State Wild Life Officer, Madras.

India's Newest and Biggest Wild Life Sanctuaries is in Tamil Nadu

THE ANAIMALAI

minister the Anaimalai Wild Life Sanctuary.

Wild Life knows no frontiers of any sort and survives in suitable habitats all over the country. It is everywhere threatened by man's increasing interference, with the balance of nature. The primary objective before us is to save our wild life—a magnificent asset and hopefully to rehabilitate it and a secondary objective is to organise our National Parks, Sanctuaries and other areas in such a way that they serve the interests of nature-study and tourism. Taking into account the crisis which we are facing, it is absolutely necessary to concentrate our resources on the creation and magnificent parks and sanctuaries.

Since the present area of our land under National Parks and sanctuaries amounts to 2.3% of our forest area or 0.535% of the total land area, there is need for establishing new parks and sanctuaries and our aim should be to have at least 4% of our total land area reserved for wild life (including floristic preserves). An attempt should be made to distribute this equitably throughout the country.

Tamil Nadu with a total land area of 1,30,357 square kilometres occupies the South-eastern part of the country with a forest area of 21,033 square kilometres and this works out to 16 per-cent of the total land area. This is rich floristically. Hydel projects and multi-purpose dams have resulted in the complete deforestation of large areas and a radical change in the character of land.

NATIONAL PARK

The rapid changes and destruction of habitats are the most-serious factors leading to the depletion of wild life. Apart from these factors, forest areas are much depleted due to various socio-economic causes. Therefore it is imperative to zealously preserve the existing flora and fauna. **In spite of its greatly reduced extent, Tamil Nadu has an interesting variety of Wild Life.** Having realised the importance to ensure the territorial integrity of wild life preserves Tamil Nadu is expanding the area under Sanctuaries by constituting new sanctuaries and taking necessary steps to create National Parks. Similarly areas under forests are being expanded by extending afforestation works outside the Reserved forests. As a result there are now six wild life sanctuaries viz.,

1. Vedanthangal Water Birds Sanctuary—(1798).
2. Mudumalai Wild Life Sanctuary—(1939).
3. Guindy Park (Children's Park)—(1958).
4. Mundanthurai Tiger Sanctuary—(1962).
5. Point Calimere Wild Life Sanctuary (1967) and
6. Anaimalai Wild Life Sanctuary—(1973).

and nineteen waterfowl refuges in Tamil Nadu. The Anaimalai Wild Life Sanctuary which is recently constituted is the sixth and largest wild life sanctuary in Tamil Nadu. Nature has been extremely lavish in providing this sanctuary with thickly wooded hills, plateaus, deep valleys, waterfalls, rivers, streams, marshes and salt licks. The various flora and topography not only meet the ecological requirements of several species of animals inhabiting this area, and easily fill the heart of the visitors with joy.

The Headquarters of the Sanctuary is at Pollachi which lies at 40th Kilometre from Coimbatore on the State High Way. The Anaimalai Wild Life Sanctuary in Tamil Nadu is situated on the Western ghats. It spreads over Pollachi and Udumalpet Taluks of Coimbatore District and partly in Kodaikanal taluk of Madurai District ; and is contiguous to Parambikulam Wild Life Sanctuary in Kerala State. The sanctuary has an area of 900 square

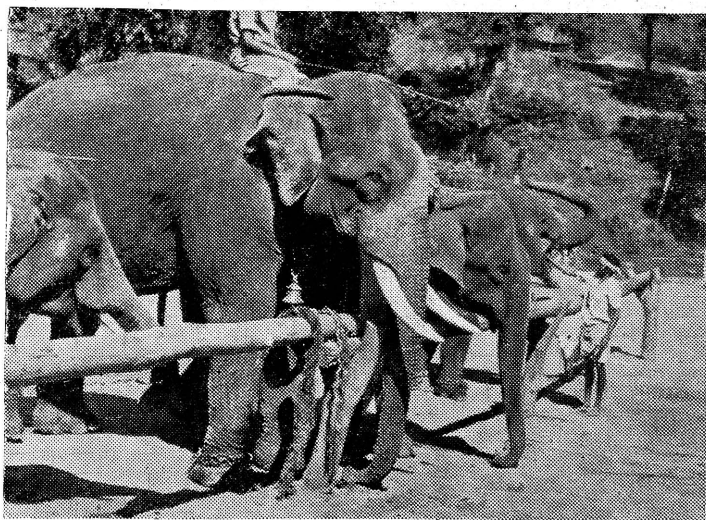
kilometres. Out of seven Reserved Forests which constitute the Anaimalai Wild Life Sanctuary, Anaimalai Reserved Forest forms about 70% of the total area of the Sanctuary (627 square kilometres). But the entire sanctuary area is known as Anaimalai (i.e., in Tamil language 'Anai' means elephant, 'Malai' means mountain) or Elephant Hills as wild elephants are predominant and found quite commonly everywhere. A pair of Hills known as Peria Anaimalai (MSL 2151 metres) (Big Elephant Hill) and Chinna Anaimalai (MSL 1888 Metres) (Small Elephant Hill) are located near Kadamparai. They look like a pair of elephants lying side by side. Thus the name Anaimalai is having different sources of origin.

Topographically the entire sanctuary area occurs on the Anaimalai Hills which are a continuation of the western ghats situated immediately south of the Palghat Gap. The northern slopes of the Anaimalai Hills descend precipitously to the cultivated plains of Coimbatore District. The main range of the Anaimalai Hills has a general direction of north-west to south-east. The elevation ranges from about 900 metres to 2,500 metres. The sanctuary is well drained by Amaravathi river in the eastern portion and by the Thorakkadavu, the Aliyar, the Sholayar, the Kallar, the Italiar, the Tunacadavu. The Periyar, the Chinnar and innumerable small stream in the western portion.

CLIMATE, RAINFALL AND DAMS

Wide variations of annual rainfall, elevation and aspect have resulted in a highly variable climate. December and January are the coolest months of the year and the climate on the hills is often marred by dense chilly mists. The period starting from end of February to end of May, remains the hottest part of the year. Towards the end of May, the south-west monsoon brings welcome relief and the climate continues to be pleasant and cool until August when the monsoon abates. September again is sultry, but October and November, experience an equable climate when the North-east monsoon is in full swing in the eastern areas of Tamil Nadu. Of all the sanctuaries in India, Anaimalai Wild Life Sanctuary is having wider variation in annual rain fall among its different parts.

Besides the Amaravathi Reservoir in Udumalpet, the Parambikulam—Aliyar Multipurpose project resulted in the construction of Dams like Sholayar, Upper Aliyar, Aliyar and Tirumurti in Tamil Nadu and Parambikulam Dam in Kerala State. At present, construction of a weir across Nirar and Kadamparai Dam across Kadamparai river is in progress. Though these projects have resulted in the destruction of a sizeable forest areas of the sanctuary, yet they provide permanent source of water for wild life ; and network of roads for the tourists.



At the Anaimalai Elephant Camp



Picture Left: The oldest elephant is now called the I.G. of Anaimalais.

The Different Types of Forests that Occur in the Sanctuary

The great diversity in its topography, and variety in climate and rainfall, that the sanctuary embodies naturally bespeak a vegetation of wide and striking variations. The elevation varies from 350 metres in the foot hills to over 2,400 metres in the Grass Hills of Punachi range with a corresponding variation in rain-fall from just about 50 centimetres to nearly 750 centimetres. At the foot of the hills, the day temperature ranges between 23 degree C and 40 degree C and the night temperature from 18 degree C and 29 degree C. At higher elevations the temperature is naturally lower, often dropping below the freezing point in the Grass Hills during winter. The mean annual humidity in the plains is 51 percent while at higher altitudes where there is greater rain fall the relative humidity is as high as 70 per cent. These variations combined with difference of soil and aspect have resulted in a considerable variety of vegetational types.

ANIMAL LIFE INCLUDES THE RARE WHITE BISON

The Sanctuary exhibits a rich and varied fauna and most of the South Indian species are well represented. Elephants, gaurs, tigers, panthers, sloth bears, wild boars, wild dogs, porcupines, blacknaped hares, Brown flying squirrels, jackals, common langurs, the Nilgiri langurs, Pangolins, civet cats, barking deer, the spotted deer, the melanistic variety of the panther, etc., are observed. The Nilgiri Tahr or the sportsman's 'Ibex' is restricted to the grassy slopes and precipitous crags on the ridges and peaks along the high hills.

'White Bison.' It seems probable that what was observed as the 'White-bison' by some forest officers in the past might have been quite likely a comparatively lighter coloured gaur, or manifestation of albinism.

Among snakes of special interest occurring in the forests of this division, mention may be made of the cobra, the Keeled viper, the Anaimalai Viper, the Russel's viper and the Hamadrayad, all of which are poisonous. Pythons are plentiful in the drier tracts. There are host of non-poisonous snakes, also. Of the other reptiles, the Indian Monitor, the beautiful black and yellow tortoise are commonly observed. Crocodiles are present only along the Amaravathi and Chinnar rivers.

BIRD LIFE

The Sanctuary abounds in a variety of birds. The avifauna consists of Racket-tailed Drongo, Red-whiskered Bulbul, Black-headed Oriole, Tree pie, Grey Malabar Hornbill, Painted Partridge, Shama, Whistling Thrush, Paradise Flycatcher, Emerald Dove, Spotted Dove, Green Pigeon, Hill Myna, Blue Jay, Jungle Babbler, Tickell's Flower-pecker, Green Barbet, Crow pheasant, Golden backed Woodpecker, the Rufus Woodpecker, Rosewinged and Blue winged Parakeets, Crested Hawk, Crested serpent Eagle, the Grey Jungle Fowl, the spur fowl, shrins, Red-vented Bulbul, Indian Robin, Black Drongo, Purple-rumped sub-bird, Kestrel, Jungle Babbler, Pea-fowl, Baya Crested Hawk, Partridge, the common Myna, Kites, Parakeets, Blue Rock Pigeon, various fly catchers, Crested Eagle, Jerdon's Chloropsis, the Ped Hornbill, Black-naped Oriole, the Nilgiri Whistling thrush, Paldi Laughing Thrush, Bonellis Eagle, Red-headed Merlin, Small Minivet, Large Barget, Nut thatches, Tits, etc.

TROUT FISHING

The Amaravathi, the Tirumutnagar and the Aliyar Dams are the only three irrigation dams in the sanctuary. The reservoirs of these three dams are frequented by a number of feathered inhabitants such as the Pond Heron, the Grey Heron, the Little Cormorant, the Large Cormorant, the Cattle Egret, White breasted King Fisher, Yellow wattled lapwing, and the common sand piper.

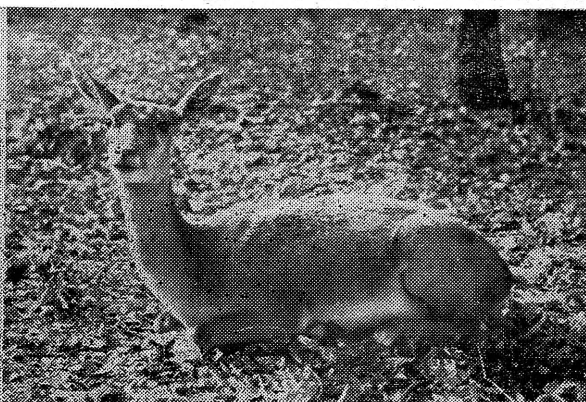
1. Southern cutch thorn forest ;
2. Southern tropical dry deciduous forests—Dry teak—forest ;
3. Dry Savannah forest ;
4. Southern Tropical moist deciduous forest ;
5. Southern moist bamboo brakes ;
6. Southern tropical wet evergreen forest ;
7. Southern wet bamboo brakes ;
8. Nilgiri-sub-Tropical evergreen forest ;
9. Southern wet temperate forest.

Descriptive details of the nature of these forest types and the predominant species are given in the revised classification of forest types in India by Champion and Seth.

The Manjampatti valley of Udumalpet range is alone said to harbour the rarest animal i.e.,



Cow elephant with its calves near Ambuliparai



Sambar Deer near waterfalls in Mount Stuart Block

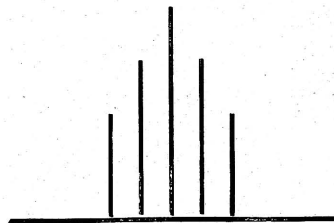
The reservoirs abound in a great variety of fishes, the rearing of which is handled by the State Fisheries Department in most of the reservoirs, Catla, Rohu, Mrigal, Labeo, Mahseer and cat fish are some of the fishes reared. In addition to these, a great variety of smaller fishes exist naturally in the reservoirs and in the perennial rivers flowing through the forests. The Konalar river which traverses the Grass Hills is managed by the Konalar Fishing Association. The Rainbow trout is reared in this river by the Association.

WILD LIFE OBSERVATION POINTS

(i) **The Wood House Lawn :** This is a grazing ground and natural 'pen' for spotted deers from 6 p.m. to 6 a.m. The size of the herd is more or less constant throughout the year as this is controlled by 'the Forest Family Planning authorities'—cuon alpinus. (wild dogs)

(ii) A drive along the network of roads enables the tourists to see and admire magnificent herds of elephants and Gaurs ('Indian Bisons')

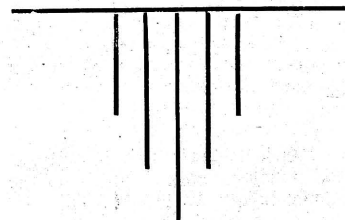
(iii) Pandaravarai, Kolambumalai, Umayamalai, Perunkundry of Tunacadavu range, Variyatuthitu and the Grass Hills of Punachi range are ideal abodes for Nilgiri Tahr. One has to hike a distance of 10—16 kilometres along steep slopes of these peaks to enjoy the beautiful scene of herds of Nilgiri tahr which lives in complete peace and freedom. One may even mistake them for "Cattle pens." These hills have a rare and unique beauty with their vast stretches of grass lands interspread with numerous compact sharply defined small woodlands called "Sholas."



Within the sanctuary area the following accommodation are available through Forest Department :

1. Wood House at Topslip—Two suites of rooms ;
2. Forest Rest House at Varagaliar—Two suites of rooms ;
3. Forest Rest House at Sethumadai—Two suites of rooms ;
4. Forest Rest House at Amara-vathi—Two suites of rooms.

For reservation in the above Rest Houses, the District Forest Officer, Coimbatore South Division at Pollachi, Tamil Nadu may be addressed. Besides, there are a number of rest houses under the control of the Public Works Department and Electricity Board which are available for the stay of the tourists. In Pollachi, a variety of private accommodation can be hired.



(iv) Anaikunthi 'Shola' is home of the Lion tailed macaque and gaur. This has been preserved.

(v) Teak forests just before the onset of south-west monsoon put forth new buds. At this stage teak forests invite Nilgiri langurs which feed on the merging buds. The entire teak forests will look like 'Park of Nilgiri langur.' This scene is very significant under the background of green veil of teak forests, Brown flying squirrels, Malabar squirrels are commonly seen.

(vi) The Amaravathi Reservoir is having plenty of crocodiles. During the summer season, though water recedes in the reservoir they find refuge in "Thoovanam Waterfall" which lies just a kilometre from the Amaravathi reservoir towards upstream.

As this sanctuary is about a year old, steps are being taken to provide more number of salt licks. Spotted deers, Gaurs, and Sambars are frequently seen in salt licks. There are also a few natural saltlicks in all grazing grounds of the wild animals.

PRIDE OF PLACE FOR ELEPHANT CAMP

A visit to the Elephant camp at Varagalai river from Topslip is a source of enjoyment and fund of delight to a visitor. In addition the camp attracts 'Bisons'; Nilgiri langurs, Malabar squirrels and flying squirrels and variety of birds. Visiting the elephants at Varagaliar elephant camp during feeding gives a very rare experience to tourists. It is delightful to see how the huge animals readily respond to the words of command of elephantmen (Mahouts and Cavadies). Young calves always play mischief and this is a source of enjoyment for tourists.

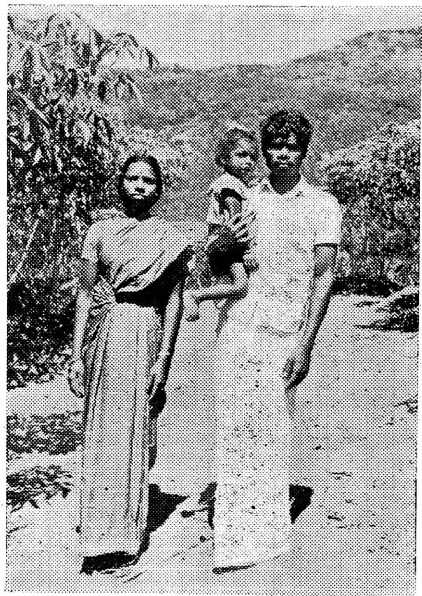


Photo left showing Hill tribe husband and wife with a child. He is working in the Electricity Board.

Photo above showing a group of hill tribes known as Gadar.

HILL TRIBES IN THE ANAI-MALAI WILD LIFE SANCTUARY

There are six different hill tribes namely the Kadaras, Malasars, Malai Malasars, Pulayars, Muduvars and Eravalars. Of these, the Eravalars constitute but a small minority generally restricted to the foot hills. The other five hill-tribes are spread out in different settlements. Each settlement known as 'pathy' consists of group of ten or more huts, huddled together on the banks of a stream or on an open glade within the forest. The huts are generally built of bamboo; the walls and roof are thatched with grass and reed leaves. The Government of Tamil Nadu has constructed good houses under Social Welfare Scheme in some of the settlements which have got easy accessibility.

SCENIC SPOTS

There are many places of scenic beauty in the sanctuary which the visitors should not miss. The following will form the list of places of scenic beauty :

Karianshola : The tropical evergreen forests occur here as post-climax. It exhibits a bewildering multiplicity of vegetation. There is also an arboretum at the entrance of Karianshola and this is of botanical interest.

Waterfalls : There are a number of magnificent waterfalls in this region which attract tourists quite frequently. Water falls near Lower Punachi, near Aliyar, near Kadamparai, near Mount Stuart, Panchalingam Waterfall near Tirumurti Koil and 'Thoovanam' near Amara-vathi Reservoir are worth mentioning.

Wood's Grave : An area of 80 metres long and 60 metres wide, symmetrically disposed round the grave of the late Hugo Wood in the 1916 teak plantation below the Mount Stuart Bungalow has been preserved. This was raised by the late Hugo Wood himself in 1916 by dibbling seeds and this will form in perpetuity a living memorial to him.

Oldest Teak Forests : Trials with tea planting were started in Mount Stuart in 1856 and subsequently systematic planting of teak was taken up in several regions. After the states re-organisation in 1956, the oldest teak plantation that has been retained in Tamil Nadu is the one which was raised in 1872 in an area of 2.43 hectares by dibbling seeds. This is preserved being oldest "Man Made Forest" in Tamil Nadu.

Panchalingam : This is a serene and religious spot located in the Panchalingam Waterfall. This lies

about 770 metres up the Palar river from Tirumurti Temple. The panoramic view of the green valley with its serenity, the magnificent waterfall, splendid Palar river and the religious spots viz., the Panchalingam and Tirumurti temple are the sources of attraction for Pilgrims and tourists.

Anaimalai Estates.—Vast stretches of contiguous Tea Estates with pockets of Cardamom and Coffee adjoin the Anaimalai Wild Life Sanctuary. This is a special feature of the Anaimalai.

HOW TO REACH THE SANCTUARY AND WHERE TO STAY?

From the airport and the Railway junction of Coimbatore, Pollachi is accessible by State Highway. There are regular and frequent bus services from Coimbatore to Pollachi. There is also Railway Station at Pollachi on Coimbatore-Madurai line and Olavakkodu—Dindigul line. The black topped roads viz., Pollachi-Parambikulam road, Pollachi-Valparai road and Udumalpet—Munnar road are running through the Anaimalai Wild Life Sanctuary. There are regular bus services plying from Pollachi to these places. The best period for visiting the Sanctuary is from May to December.

Mudumalai Wild Life Sanctuary An attraction To The Tourists



Gaur with Calf in Sechali Valley of Anaimalai sanctuary

Mudumalai Wild Life Sanctuary is one of the important sanctuaries in India. It is a major tourist attraction in the Nilgiris. Numerous tourists from all over the world visit the sanctuary every year. It lies in the Nilgiris district of Tamilnadu State abutting Kerala and Mysore States. It is situated at an elevation of 1,000 metres and extends over an area of 324 sq. km. Nature has been lavish in providing this sanctuary with thickly wooded hills, plateaus, deep valleys, waterfalls, rivers, streams, marshes and salt licks.

FAUNA AND FLORA IN THE SANCTUARY

The sanctuary is rich in animal life. Herds of elephants are very commonly seen in bamboo forests along the water courses. Chital population is so high that no one can miss them especially in the Masinagudi area. Sambar, though not plentiful, are available in sufficient numbers. One can also see gaur (Indian bison), wild boar, barking deer, mouse deer, Indian porcupine

etc., in the sanctuary. Packs of wild dogs can be seen chasing the chital. Other animals commonly seen are malabar squirrel, flying squirrel, common langur, bonnet monkey, blacknaped hare etc. A panther and occasionally a tiger may also be seen if one has real good luck. Bears may be seen mostly in the early hours of the morning and late in the evening.

Pythons are among the advertised reptilian attraction of the sanctuary but there are a number of snakes more commonly seen, including cobras, rat snakes and the saw scaled viper. Monitor lizards are a special feature of the Masinagudi scrub where they attain a large size.

For bird watchers, the sanctuary is a paradise. Their chorus at dawn is a delight to the visitor. One can see a variety of birds such as grey jungle fowl, peafowl, spur fowl, grey partridge and quail crossing the forest roads. Shama, common iora, golden oriole and scarlet minivet entertain the visitors with their

sweet melodies. Racket tailed drongo, malabar grey hornbill, malabar trogon, paradise fly catcher, nightjar, hill mynah, woodpeckers, pigeons etc., are also seen.

The sanctuary will appeal as much to people interested in the flora as to those who care for wild animals. The vegetation within the sanctuary varies from deciduous to evergreen type. In the drier localities of the sanctuary species of Acacia and Albizzia, with a low undergrowth of lantana and other thorny bushes and short grasses are seen with a sprinkling of sandalwood. In the other areas of Mudumalai, one comes across valuable timber species such as rosewood, teak, ventea, vangai etc. Screw pine can be found along the streams and streamlets. Bamboo brakes are a special feature of the sanctuary and they are found in the moist regions.

THE ELEPHANT CAMP

The Elephant camp where tamed elephants are kept is situated in the heart of the sanctuary at Theppak-

kadu. A visit to the elephant camp during the feeding time in the morning or evening is a 'must'. You can also see and enjoy the baby elephants performing tricks. Elephants are available for ride through the sanctuary. Four adults can ride on one elephant for Rs. 10/- which is exclusive of visiting charges. The rides are available at 6.00 A.M., 8.00 A.M. and 4.30 P.M. Advance booking is required for elephant ride.

MOYAR WATER FALLS

The Moyar is the main river of the sanctuary and provides perennial water, satisfying the needs of all animals, big and small, for drinking, wallowing and bathing. In places it is a deep, fast flowing river with an impressive series of cascades at the waterfall in Theppakkadu which no one should miss. The Kargudi view point is near Kargudi rest house. From here one gets a panoramic view of the country around.

ACCOMMODATION AND OTHER FACILITIES.

There are four well equipped rest houses in the sanctuary viz., Abhyaranyam, Kargudi, Sylvan Lodge and Masinogudi rest houses. The reservation for Sylvan Lodge is done by the State Wild Life Officer, Madras-6. Locally, reservation will be done subject to availability, by Wild Life Range Officer, Kargudi. The reservation for other rest houses and elephant ride is done in the District Forest Office, Nilgiris North Division, Ootacamund. Vans and jeeps are available to go round the sanctuary on payment.

HOW TO REACH THE SANCTUARY?

From the Coimbatore airport Mudumalai is accessible by good road, the distance being 160 km.

The nearest railheads are Ootacamund and Mysore. Visitors can reach Kargudi by bus from Ootacamund and also from Mysore. It is 64 km. from Ootacamund and 95 km. from Mysore. Ootacamund Mysore main road runs through the sanctuary. There are bus stops at Abhyaranyam rest house and at the Office of the Wild Life Range Officer, Kargudi. Tourist buses are available during the season at Ootacamund in the months April and May for visiting the sanctuary. Regular buses also ply from Ootacamund to Mysore, to Moyar, to Gundalpet etc. via this sanctuary.

BEST TIME TO VISIT.

It is ideal to visit the sanctuary between February and June when the tall elephant grass dries up, increasing visibility considerably. The most suitable time to go round the sanctuary is between 6 and 9 in the morning and between 4 and 6 in the evening.

The rates are as follows :—
Abhyaranyam (two suites) Kargudi (two suites) and Masinagudi (three suites)

	Rs.
Single person ..	5.00
Every additional person ..	5.20
Sylvan Lodge (4 suites)	
1. For a single person ..	7.50
2. For Husband and Wife ..	11.25
3. For each son or daughter over 12 years ..	4.00
4. For each person over 12 of age other than son or daughter ..	5.00

Tent (Near Sylvan Lodge) :—Re. 1/- per person per day

Visiting Charges :—Re. 1/- per head for adults and Re. 0.50 per head for children above three years and below twelve years.

USE OF PRIVATE CARS AND VANS INSIDE SANCTUARY

Rs. 5/- per car per day and Rs. 7.50 per van will be charged for the use of private vehicles inside the sanctuary. Vehicles are permitted inside the sanctuary only at the RISK of the owner.

Camera Charge:—A sum of Rs. 2/- is charged for an ordinary still camera per day and Rs. 10/- for a movie camera per day.

FOREST DEPARTMENT VEHICLES HIRE CHARGES.

Jeep

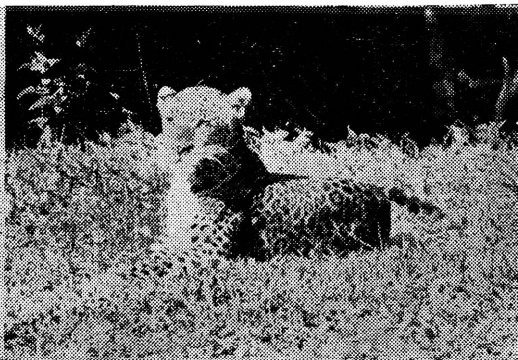
Mini bus (10 seats)—Re. 0.25 paise per person Mini bus (20 seats) Van (20 seats) subject to a minimum of Rs. 1.50 per km.

Guide Services :—For all assistance and necessary arrangements the Wild Life Range Officer, Kargudi may be contacted (Phone Gudalur 26) At Ootacamund, the District Forest Officer, Nilgiris North Division may be contacted for information and guidance (Phone 2335). Payment has to be made in advance, to confirm reservation in the District Forest Office.

Tips to Visitors .—When out for a look at the Sanctuary's wild life, dull coloured clothes are the best and if they are the older and more "seasoned" all the better. While on an elephant ride, avoid conversation and do not project your legs beyond the planks provided for rest. Smoking is strictly prohibited during the rides. Even with all these precautions, a close look at any wild beast is largely a matter of luck depending very much on its mood and its tolerance of your proximity.



Teddy Cat near Chinnar.



Panther near Singam Ghat Road, both of Anaimalais.

UNIQUE PROBLEMS FACED IN THE DEVELOPMENT OF Hill areas

The hill areas of the Indian economy have historically been a neglected lot despite their strategic and ecological significance. In several deliberations that have been held to devise ways and evolve strategies for spurring development in the hill areas, attention has been drawn to their peculiar physiogeographical conditions, difficult climate and terrain, inadequate rate of growth, near absence of even the basic minimum of social and economic overheads, abject poverty, etc. It is often said that the hill areas lead a semi-autarchic life and have a pattern of relationship with the plains which is more in the nature of international trade than of integrated participation. It is also stressed that the resource homogeneity in the hill areas enhanced by climatic and geographical conditions has such a decisive influence on the potentialities of development that the approach to their problem has to be found largely within the regional setting of the hills.

The problems of the hills are quite different from the problems of the development of the country as a whole. The main causes for the backwardness of hill areas could be seen in :

(a) thin and very uneven dispersal of productive resources (yielding private incomes) in relation to the vastness of the area ;

(b) high cost of provision of infra-structural and social service facilities because of low density of population spread very unevenly over the area ;

(c) lack of knowledge about resources endowment and about research and operational experience specifically relevant to the conditions and problems of the hill areas ;

(d) failure to identify and plan for the integrated development of these areas on the basis of priorities, norms for resource allocation,

procedures, staffing patterns and incentives and disincentives specifically evolved on the basis of local conditions, experiences and potentials and

(e) continuance of development schemes from plan to plan without any systematic appraisal.

CENTRAL ASSISTANCE

The Centre has been aware of these problems and even before the Fourth Plan it had assumed larger responsibilities for the hill areas than for the other areas in the country. The pattern of central assistance was much more liberal for the hill areas than for the plains, and for a number of border districts the Centre was meeting almost the entire expenditure on development schemes. In the Fourth Plan also, which otherwise lays down that the development of the backward regions is essentially the responsibility of the States, and therefore, does not provide for any additional or specific central assistance to the States for these areas, considerable incentive for making sizeable allocation to the hill areas had been offered by providing between 50% and 90% grants from the Centre within the central assistance accruing to a State on account of the expenditure incurred in the hill areas. As against this liberal proportion of grant for the hill areas for the rest of the areas the proportion of grant and loan is only 30 : 70. Apart from providing this incentive, the Planning Commission had also been urging the States to treat their hill areas as separate planning regions and to make separate provisions in their Annual Plans for these areas in the light of their problems, potentials and priorities.

Experience of the first three Five Year Plans as well as of the Fourth Five Year Plan has shown that the accelerated development of the hill areas requires much more than mere earmarking of larger alloca-

tion of financial resources. In a number of cases it has also been found that even though substantial allocations were made, these could not be adequately utilised. Even where actual expenditure matched the allocations, the impact of the development programmes taken up was neither adequate nor sufficiently wide-spread to cover the different areas and sections of the population. The main problem seemed to be the absence of planning specifically oriented to local conditions. This could lead to the formulation and implementation of programmes in consonance with topographical and agro-climatic conditions, availability of natural resources, characteristic composition of population, peculiarities of socio-cultural structure and the nature of linkages and interaction between the hill and the plain areas. This aspect is particularly important in the case of small States like Nagaland, Meghalaya, Himachal Pradesh and Assam where a sizeable portion of the population belongs to the scheduled castes and scheduled tribes. Further the carving out of a number of small units in the hill areas has created serious imbalances between natural resources and the availability of financial resources for their exploitation. With the present financial structure, many of these units find it difficult to raise adequate resources for taking up multi-purpose irrigation and power projects or the setting up of forest and other resources-based industries with their own funds. In any case, the population and size of some of these units are so small that there are obvious difficulties in taking investment decisions with reference to their requirements alone, or without considering the costs and benefits of alternative proposals for investment in other contiguous areas. In recognition of this, some work has been done for a general assessment of resources and the identification of investment opportunities and development potentials in the North-East Resources Region. Already North Eastern Regional

Council has been set up for better coordination and planning.

EXISTING PROCEDURES

It has also been observed that in the approach adopted till now for the development of the hill areas, the existing procedures and machinery of planning are oriented to decision making at the Central and State levels. As a result, the priorities adopted and the programmes launched in various areas are not in consonance with the requirements and potentials of those regions which are significantly different from other areas with regard to resource potential and the size and characteristics of the financial and human resources. In addition to this basic problem, there is also the serious problem of the availability of reliable and comprehensive statistics. For a very large portion of the hill region, the maintenance of records and the collection of agricultural statistics is at a rudimentary stage. Most of the research programmes undertaken by the different institutions have also been oriented to the problems of the plains and even where some research has been done on the problems of hill areas, the results obtained are not adequately reflected in the development schemes taken up in the hill areas. So far as the smaller States in the Himalayan region are concerned they suffer from a serious handicap of the paucity of technical personnel. While it may be possible for some States like U.P. to draw upon the resources of an institution like the U.P. Agricultural University and a large number of academic and technical institutions, States like Nagaland, Meghalaya, Assam or Jammu & Kashmir are obviously operating under serious disadvantages.

While the problems of hill areas are in a way unique and very much complicated, administrative machinery available to some of the hill States is also inadequate both in terms of numbers as well as expenditure. From time to time Expert Committees and Visiting Teams have attempted to formulate some ideas of the approach to the planning of hill areas but these have generally not proved very useful because the conclusions were based largely upon very limited direct observation. The absence of a suitable system of data

collection has also impeded the development of the areas in the Himalayan Region by making it very difficult for the States to undertake proper monitoring and appraisal of the development schemes introduced in these areas. As a result a number of programmes which were patterned on the experience in the plains were introduced in the hill areas and have continued for a long time in spite of their not having met with much success.

NEW APPROACH

The policy for the Fifth Plan with regard to the accelerated development of hill areas has been formulated on the promise that the States will prepare separate integrated plans and programmes for their hill areas taking into account the local resources, potentialities and priorities. The Centre will provide technical and methodological assistance to the States in this behalf during the Fifth Five Year Plan. In order to promote the preparation of separate integrated plans for the hill areas, the Planning Commission have set up a Hill Area Cell, the principal responsibilities of which will be to provide methodological assistance, and to liaise with Departments and Ministries having a stake in the development of the hill areas. Further, it has also been decided that in addition to continuing favourable pattern of Central assistance and the determination of the plan size of the hill States on the basis of their essential requirements as in the Fourth Plan, additional allocation of funds will be made to supplement the funds set apart by the States from their Plan resources. It is expected that the supplementary funds which will accrue to the States for purposes of hill area development, will strengthen their economy and create pre-conditions for their successful take-off during the Fifth Five Year Plan.

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MADRAS FERTILISERS ACHIEVE ONE MILLION TONNES FERTILIZER PRODUCTION

The Madras Fertilizers Limited (MFL) achieved the Production of one Million tonnes of fertilizers as on April 9, 1974. The Plant went into commercial production on November 1, 1971 and is now in the third year of production.

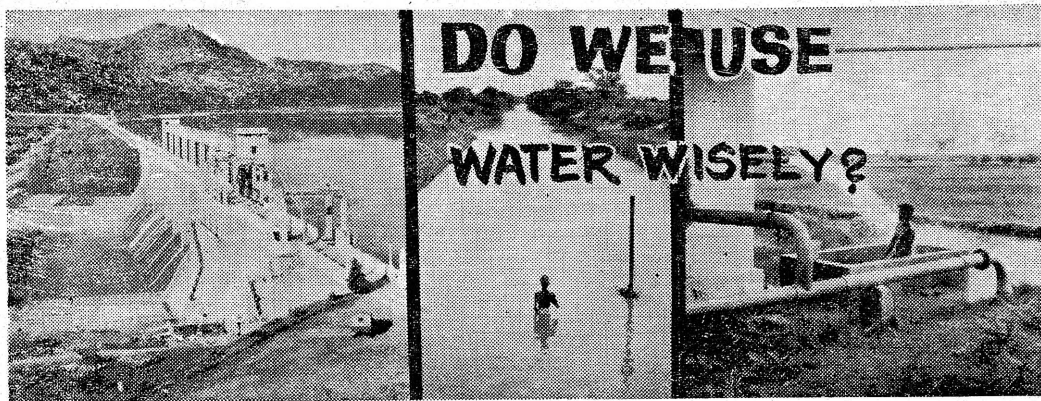
MFL ranked as the second largest producer of fertilizers in India during 1972-73, having produced 412,000 MT of fertilizers, comprising of 126,000 MT Urea and 286,000 MT NPK. The Plant attained a production of 441,526 MT of fertilizers for the year 1973-74 consisting of 173,817 MT of Urea and 267,709 MT of NPK. The cumulative production as on 9-4-1974 is one million tonnes, consisting of 372,000 MT of Urea and 628,000 MT of NPK.

The plant achieved 1.8 million man hours lost time accident free operation in November 1973, which is a good safety record.

The Rs. 65 crores fertilizer project is a public sector undertaking with Indo-American-Iranian co-operation. The Government of India holds 51% shares while the Amoco India Incorporated, a subsidiary of Standard Oil Indiana, USA holds 24.5% shares and the National Iranian Oil Company of Iran holds 24.5% shares.

The MFL fertilizer complex consists of Ammonia Plant with a rated capacity of 750 MT per day, Urea Plant with a rated capacity of 885 MT per day and NPK Plant with a rated capacity of 1,100-1,300 MT per day.

As part of the expansion plans, the plant has signed a contract with DORR-OLIVER for construction of a third train of NPK. When this train is commissioned the NPK production capacity is expected to increase by 50% i.e., by 181,500 MT per annum, thereby raising the total NPK production capacity to 544,400 MT per annum.



Water conservation is a subject of growing concern in Community everywhere. As the demand for water is increasing day by day for drinking, Industries and Agricultural purposes, the public and Government are studying ways and means of conserving the same and utilise it for the maximum benefit possible. As more than 85% of water available is used for the irrigation of agricultural lands, there is a great scope in saving water which is used for agricultural products increases; more land inevitably will be put under irrigation. This poses a demand for additional water from supplies that are already in great demand in this State. But experience with conservation farming on irrigated land and the improvements in irrigation efficiency that has been attained by various research workers can help to meet future water problem. These possibilities are given below in this paper.

1. Reducing losses in storage and conveyance. The first big drain in the irrigation water is through evaporation and seepage from reservoirs and canals. It has been estimated that nearly 50% of the water withdrawn from the reservoir is not reaching the farm where it is used. Even in garden land conditions, about 1/5 of the water pumped is not available for irrigating the lands. In Tamil Nadu, there are about 40,000 tanks big and small. The loss on evaporation will be tremendous since ours being a hot country. Another means of water loss is transpiration by non-beneficial plants that grow along canal and stream and around the edge of reservoirs and tanks.

It is possible to increase the area of irrigation if we prevent the

losses mentioned above. The seepage losses can be reduced or prevented by lining canals and carrying water through underground pipe lines. Similarly, the evaporation losses can be avoided to some extent by having monomolecules films on the water surfaces in tanks and reservoirs. Further it is possible to remove the unwanted and useless plants on the sides of canals, reservoirs etc.

By

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The improvements of storage and conveyance system may be expensive, but the amount of water which is going to be saved will prove worth to take up this water saving measures.

2. Improving water use efficiency by suitable irrigation method : After water is conveyed to the point of use, it must be used beneficially on the Farm. Irrigation is done by basin, check basin, border and furrow methods. The type of irrigation and the optimum size of the particular system has to be worked out for different soils and crop systems. This is true even in

the case of paddy fields. Studies conducted at Tamil Nadu Agricultural University, Coimbatore on cotton crop has indicated that furrow is the best method for cotton wherein 20–30% of water can be saved comparing the other methods without affecting the yield. Similar studies conducted on grapes and banana have shown that flooding to the entire basin of the plant is not necessary and the optimum size of the basin for each crop may differ from place to place and this has to be found out in order to improve the water use efficiency.

Though the potential irrigation efficiency is in the range of 85 to 90%, if we increase the efficiency by 10% to 15% from the present level, this would increase the irrigated acreage more than one third with the available water.

3. Adopting improved irrigation method like sprinkler and drip irrigation : The method of irrigation is as old as civilization in our country. There is no improved irrigation methods though some advances in this regard have been made by advanced countries like, sprinkler and drip methods.

In sprinkler method, water is applied in the form of spray like rain. Though this method was started in 1900, this has not been adopted in our State. Sprinkler has been used in all soil types and on lands of widely different topography and slopes and for many crops. Studies conducted for groundnut and cotton crops have indicated that we could save about 30% of water without affecting the yield.

The cost of installation works out about Rs. 1,500—2,000 per acre. This method is practiced in plantation crops in the State.

The latest method adopted to conserve water is the drip irrigation. The main theme in this type of irrigation is to give water directly to each plant. This method is possible since low cost plastic tubing is available in the market. The cost of system works out to Rs. 2,500—3,000 per acre. Experiments conducted for vegetable crops at Tamil Nadu Agricultural University, Coimbatore has shown that only about 1/3 to 1/5 of the water used in the conventional method is sufficient. At the same time, the yield is increased by 10—40%. By introducing drip irrigation method, it is possible to save large amount of water which can be used to bring more area under irrigation.

4. Reducing irrigation requirements by applying the water when it needs : Irrigation requirement refer to the quantity of irrigation water per unit area of land required at the farm to adequately irrigate the crops. Climate, soil, plant, irrigation system, management factor that affect a water consumption mechanism alters irrigation requirement.

Numerous possibilities for reducing requirements exists through better crop adoption, variety selection and improvement and improved cultural practices. Water use can be reduced by irrigating the crop when it needs. Some crop can tolerate stress in the early stage of growth and others at later stages. By knowing the critical stages of growth for each crop and if irrigation is done at that time, there is possibilities of reducing water. Yet another method of reducing irrigation water is in use of varieties that inherently have a low evapotranspiration such as millet crops. Significant reduction in transpiration might be affected through plant breeding in selection to incorporate a reduction in number of location of stomates or a change in other leaf characteristics which influence transpiration.

Crop cultural practices warrant consideration in assessing possibilities for reducing irrigation requirements. The adjustments of planting dates for shorten the growing season, to avoid high (ET) Evapo-

transpiration in summer, selecting proper row direction, plant spacing etc. may be thought of in this direction. By proper weed control alone, the irrigation efficiency can be increased considerably.

5. Irrigation for maximum production : The aim of supplying water to the crop is to get maximum production. This does not mean that if we give, more water, the yield is increased proportionately. The yield increase depends water stress, soil structure, interaction with fertility and other various factors. Hence it becomes necessary to determine the yield response in relation to water input. Such a relationship is known as water production function. Thus effective use of water is possible only if information is available to permit estimation of the economic contribution of irrigation to crop production. It is therefore very essential to find out the water production function to each and every crop grown in the region or State so that the maximum benefit could be arrived from the available water. For example, by applying 120" of water the yield of sugarcane is 80 tonnes but by restricting water to 80", the yield obtained was 60 tonnes where the water is limiting factor, it is advisable to give 80" of water to obtain 60 tonnes instead of giving 120" of water to produce 80 tonnes. This kind of study should be undertaken in a systematic manner for all crops. This study will be very useful in years of less than normal rainfalls in order to predict the effects of water shortage of crop yields.

6. Water delivery system : More than 40% of water used is drawn from the irrigation projects in this State. The method of water delivery has definite effect on project irrigation efficiency. The application of irrigation water must be closely adjusted both to the requirement of the crop and to the available water holding capacity of the soil root zone. The method adopted in this State is the continuous flow system. In this method water is wasted and this contributes to water logging in some area. The other methods which can be followed are :

- (1) The demand system and
- (2) the Rotation system.

In the demand system, water is delivered to the Farm at times and

in quantities as requested by the water user. This system offer many opportunities for a project to encourage wise use of water and thereby higher irrigation efficiency. But this requires alert, ingenious and flexible operational ability and good communication system.

The Rotation system is probably the most flexible of all methods. Under this system water is delivered to each farmer in sufficient quantities for a fixed period of time under pre-arranged schedule. By careful management, good irrigation efficiency can be recommended under this system. Our present practice of allowing water continuously may be modified in order to obtain maximum project efficiency.

To practice and follow the above methods, intensive research on water use and management is to be taken up.

Though considerable knowledge in watershed management, storage, conveyance, application of irrigation water and water use by crop has already been produced by research workers, substantial improvements in water use efficiency could be achieved only by utilising knowledge currently available. This call for programmes of education both for farmer and for personnel of irrigation and revenue departments and of extension services. Substantial improvement in water management practices in agricultural production could be achieved by suitable adaptation of knowledge existing in other areas. Emphasis should be given on those research projects which will immediately benefit the farmer for using less water without affecting the yield. This is necessary for our State in view of the fact that we have already harnessed the available water.

PURE WATER UNDER OCEAN

The first European settlers in Australia noticed that the aborigines in the northern part of the country obtained water from the sea through long bamboo pipes. A similar method is still employed today by the inhabitants of Bahrain island in the Persian Gulf, who use long reeds instead of bamboo pipes. The fact is that there are fresh water springs on the bottom of the ocean as well as on land.

THE ORGANISATION AND ADMINISTRATION OF Tamil Nadu FIRE SERVICE Department

The Fire Service Organisation is a humanitarian service dedicated to the saving of life and property in the event of natural calamities like floods, cyclone, earth-quake and also from fire and other accidents and its services are available to the public at all times. The provincialised Fire Service came into being in 1942, when there was no Fire Service in this State except in Madras City where a small Fire Brigade was maintained by the Corporation of Madras. It is functioning as a separate permanent department from October, 1967.

Functions and activities of the Department

The activities of the Fire Service Department are primarily and mainly the prevention and extinction of fire. However, at other times, the Department also renders valuable help and assistance to the public in a variety of ways, such as protection from fire at fairs and festivals, rescue of human beings and animals from collapsed structures, wells and floods and other major disasters, transportation of the sick and the injured to hospitals for immediate medical attention and aid. They also aid and assist the Public Health Department in cases of epidemics. Their services are also requisitioned by the Police during elections, riots and other bandobust duties. Besides these varied humanitarian services, the personnel of the Fire Service Department are also charged with the duty to inspect premises licensed or to be licensed under many Acts and Rules, namely, the Places of Public Resort Act, the Tamil Nadu District Municipalities Act, and the Madras City Municipal Corporation Act, the Tamil Nadu Village Panchayats Act, the Arms Act and Rules framed thereunder, the Tamil Nadu Factory Rules, etc.

Administrative Set up

The Director of Fire Service is the Head of the Fire Service Department. He controls and manages the Fire Service organisation in the State. He is assisted by an Administrative Personal Assistant at the Headquarters in Madras City.

Tamil Nadu

Fire Service

Week Special

For the purposes of Fire Service Administration, the State is divided into Regions as North and South, each under the charge of a Deputy

Director of Fire Service, with Headquarters at Madras and Madurai respectively. Each Region comprises a few Fire Service Divisions. Each Division consists of one or more continuous revenue districts. A Divisional Fire Officer is in charge of each Fire Service Division. He controls and manages the Fire Stations in the districts within his division. Each Divisional Fire Officer has an office of his own with the requisite administrative staff. Further, he is assisted by one or more Assistant Divisional Fire Officers at his Headquarters on operational matters. The details of the two Regions, number of Fire Service Divisions in each Region, the revenue districts comprising each fire service division and the

<i>Region</i>	<i>Sl. No.</i>	<i>Name of Fire Service Division</i>	<i>Name of Revenue District Comprising the Division</i>	<i>No. of Fire-Stations functioning.</i>
Northern Region	1	Madras City	Madras	14
	2	Vellore Division	Dharmapuri North Arcot Salem	1 7 1
	3	Cuddalore Division	Chingleput South Arcot	4 6
	4	Tiruchirappalli Division	Tiruchirappalli Pudukkottai Thanjavur	5 1 1
Southern Region	5	Coimbatore Division	Coimbatore Nilgiris	7 2
	6	Palayamkottai Division	Kanyakumari Ramanathapuram Tirunelveli	1 6 4
	7	Madurai Division	Madurai	7
Total				73

number of fire stations functioning are given in the previous page :

The Fire Station is the basic unit of the Department. The normal jurisdiction of a Fire Station extends to the Municipal, Panchayat or township limit within which it is located. It is placed under the charge of a Station Fire Officer. One or more fire appliances are generally attached to a Fire Station. Each appliance is under the charge of a Leading Fireman under whose immediate supervision and control the rest of the crews of the appliance work. Fire Stations function round the clock. Therefore, the staff attached to the Fire Station work on two shifts.

Scheme for opening of new Fire Stations

For the purpose of opening of Fire Stations the Government have approved a priority list. There are 55 towns in which Fire Stations have to be opened. In order to quicken the pace of establishment of fire stations in all the towns in the priority list, the Government have

approved the proposal of establishment of single unit fire stations i.e. one Mobile Tank Unit carrying a Portable Pump as against two unit fire stations as before.

Ambulance Service

In addition to Fire Units, Ambulances are attached to Fire Stations on a suitable scale in each town. Casualties of all types of accidents are quickly removed to the nearest hospital free of charge. Even sick patients, who cannot afford to meet the Ambulance hire charges are conveyed free to hospital.

Training

The Fire Service State Training School, Madras, is the only central institution where the men and officers of this Department are given the initial training, and also refresher courses of training thereafter. The School functions throughout the year without break.

Repairs and Maintenance

This department maintains a

Workshop at Madras for attending to major repairs to departmental vehicles, equipments, etc. In each of the seven Divisional Headquarters a Mobile Repair Squad functions to attend to the normal repairs to the vehicles at various fire stations in the Division.

Welfare

The Tamil Nadu Fire Service Benevolent Fund-cum-Welfare Organisation founded in 1962 is intended to render financial help to members of the force in distress and for promoting their welfare. Financial assistance is granted to members to purchase nourishing diet for themselves or their dependants, who suffer from tuberculosis, leprosy, cancer, etc., to meet the cost of college education of their children, to provide relief to the families of deceased members, to meet the funeral expenses of their dependants and also token grants to the retired members who did not avail any assistance from the fund during their Service.

FIRE PREVENTION PROTECTION AND FIGHTING IN COTTON SPINNING AND WEAVING MILLS

Introduction.—Cotton is the vegetable fibre which covers the seed of the cottonplant. It consists of almost pure cellulose and ignites and burns quickly and easily. Burning cotton gives off dense smoke and cotton is liable to spontaneous combustion, under the usual conditions. Therefore the fire problems in the cotton and spinning mills are grave and are on a large scale.

Constructions of Mills.—Generally cotton mills are of several storeys and with load-bearing walls. Modern mills are with double boarded wooden floors laid on reinforced concrete and supported on unprotected cast iron columns. The roof may be with re-inforced concrete as well. Two or more stone staircases may be found and the hoist serving the various floors with sliding or self-closing doors. Power may be from steam or electricity.

Process : (i) *Spinning.*—Cotton is fed through the bale-breaking machine into wood enclosed bins called the mixings. There it is

passed by the hopper feeders into openers which repeat the cleaning and opening process ending in the scutching machine. Dust is extracted in these processes. Then the carding process takes place in which the cotton becomes a thin sliver.

(ii) *Weaving.*—Taping is a preliminary process in the weaving process where the thread is finished with size, in large steam-heated machines and then another process "drawing" is undergone by which the ends of warp threads are drawn through the healds.

Fire Risks : (i) *Cotton Storage:*—Cotton is imported in highly compressed bales of approximately 400 to 700 lbs. weight covered with jute sacking and banded with steel.

(ii) In the spinning process dust is extracted while cleaning and passed through dust chambers in the lowest floors. The dust is highly inflammable and presents therefore a high fire risk in the mills.

(iii) In the carding section, the carding machines are of great delicacy and value. There may be 200 in a room and the cotton in the carding stage also presents a high fire hazard.

Causes of Fire : (i) Sparks due to friction or foreign bodies or over-heated bearing in the machines are frequent causes of fires in the cotton mills.

(ii) Electrical sparks and short circuits do also cause fires.

(iii) Human carelessness, that is careless smoking have also caused numerous fires in these mills.

Fire Protection : (i) Where cotton is handled in fine stages, the entire length and breadth of the storage rooms, cleaning section, carding section etc., are fully sprinklered. The Sprinklers are fed by static water supplies ranging from 80,000 to 2,000,000 gallons.

(ii) A wet or a dry riser may also found in the mills.

(iii) Hose reel equipment fed by over-head tanks are not un-common in these mills.

(iv) Portable fire extinguishers are provided in addition to the sprinklers.

(v) Automatic fire doors to isolate the involved section are common provisions.

Fire Fighting.—Fires in the mills should be attacked from the inside of the building with speed and medium for fire extinction. Hand-controlled and Diffuser Branch Pipes help to save water damage. In certain sections, steam nozzles may also be installed to maintain humidity. This may also be availed of in case of fires. Salvage operations are an important item in fire fighting as much damage can be saved by covering, draining and judicious use

of water. Cotton stains and shrinks when drenched in the process-completion stage. Breathing apparatus should be worn while fighting fire in dense smoke.

By

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FIRE PREVENTION AT TIMBER FORESTS

It is most intriguing to note that an element of danger is invariably associated with even the most indispensable of God's creations like Fire. As the tentacles of modern science and Technology spread in every nook and corner of the world, the perils and hazards, which are the byproducts of the march towards progress, also increase at a rapid rate. Fire poses a serious threat to human efforts in the accumulation of huge piles of stock. Fire prevention thus assumes a major role in ensuring the safety of materials.

Timber stocks are the victims of many a fire accident in the country. They result more due to the negligence of the personnel in the depots rather than anything else. Sawdust chips, barks and other waste may easily ignite and so they should not be allowed to accumulate. Sawdust presents a serious hazard in the sense that burning may occur without any flame being present and all that may be visible is a darkening of the surface and occasional glowing embers covering the surface. The real threat lies in the fact that a fire may burrow deep into a heap and lie dormant for a long time but it is bound to flame when disturbed.

The Timber yard should be kept clear of grass, weeds etc. But if it is found impracticable, such vegetation should be cut short and the cuttings cleared from the premises. Smoking is another source from which serious fire accidents result. Efforts should be taken to prohibit smoking in and around the storage area. Notices to this effect should be prominently displayed.

Heating-Lighting and Cooking :—

The use of naked flames, whether for cooking or boiling water should be permitted only in offices, Canteen and Workmen's cabins. All heating equipments must be securely

and permanently fixed. If heating is by solid fuel :—

- (a) Unless the room in which the stove is installed has a concrete floor, such stoves should stand on concrete bases atleast 6" in thickness.
- (b) Stoves and flue pipes should not be within 2' from any unprotected wooden articles. If this is unavoidable, they should be protected either by a metal sheet with an air space of atleast 1" between the sheet and the wooden materials.
- (c) When the flue pipes pass through any wall, partition or ceiling or roof constructed wholly or partly of combustible material, they should be surrounded by stoneware sleeves or collars with an internal diameter of not less than 2" greater than the external diameter of the flue.
- (d) all flue pipes should be fitted with efficient spark arrestors.
- (e) Asbestos cement flue pipes should not be used, if electrical heating and cooking equipments are used.
- (f) they should be securely fixed either to the wall or floor.
- (g) If the floor is of combustible material, concrete or brick base should be provided.

Petrol driven vehicles should not be left unattended near the timber storage space. The storage and handling of petroleum and other inflammable liquids and particularly, refuelling near the storage space, is extremely dangerous and should be strictly prohibited.

Buildings within the storage area should be provided with fire extinguishers. With the increasing use of electrical equipment and

mechanical appliances using diesel oil and petrol, these may be special risks calling for the use of special types of extinguishers. Extinguishers for use in timber stacks should be of Soda-acid and water. They should be kept at prominent and strategic points in the area.

Much of the loss sustained in timber fires is due to unsatisfactory siting of stack, the absence of access lanes or failure to keep access lanes free from obstructions.

If, owing to delay in detection or for some other reason, a fire has become well alight, it may be that in spite of the initial efforts to extinguish it, its progress will only be arrested by a fire break of suitable width. The nature and size of firebreaks will tend to vary according to the layout of each particular site.

When Railway sleepers, logs and mining timber are staked by mechanical means and the stacking does not exceed 20' in height, fire-breaks of 60' in width should be maintained for each 50,000 sq. ft. of storage area. Above this height, wider breaks should be provided.

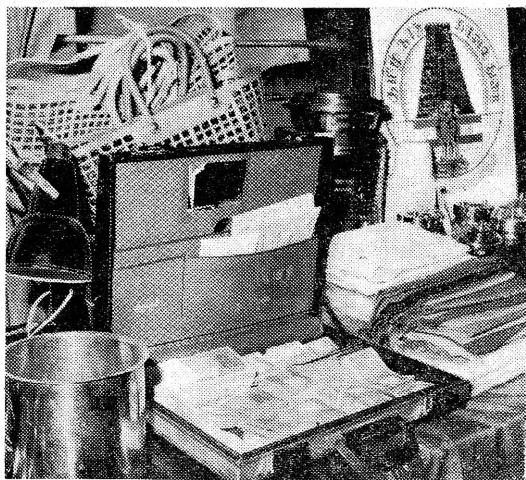
For mining timber and other forms of roundwood, firebreaks of 120' width should be provided for every 2,00,000 sq. ft. of storage area.

There should be easy access to supplementary water supplies, open water such as canals and rivers. Position of hydrants should be clear and unobstructed. There must be proper and constant maintenance of hydrants, hose, and similar equipments and steps should be taken to ensure that hydrant outlets and indicator plates are of the type in use by the local fire service.

By

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DETECTION OUTSTRIPS NEW MODES OF THEFT

Thieves are always alive and alert to the change of time and tide. More often than not, they prefer to be in advance of the trends of scientific and technological invention. In this connection the Tamil Nadu Police, true to its traditions of outstanding performances in the past, have done a creditable service to the department as well as the public by unearthing and bringing to limelight the new but novel modes and methods of theft in the State.

IDOL THEFTS

Idol thefts from temples are not uncommon as they fetch fabulous prices as art objects in foreign markets. In this line, a new modus operandi has come to notice recently in Thanjavur district. The culprits, with the connivance and active participation of the priest of the temple concerned, removed the original idols cladestinely and substituted cheap faked ones in their place. Five such instances of substitution of faked idols were unearthed by the staff of the Special Cell of the Crime Branch, C.I.D. between August, 1973 and January, 1974. The idols involved in these instances are Chandrasekarar and Prathoshanainar idols in Vilavaneswar temple at Thiruvaiagarur, Nataraja idol in Agastheeswarar temple at Serugudi village, Somaskandarswamy and two Amman idols in the Sathiasvagar temple at Mathur, Vinayagar and Prathoshanayanar idols in Viswa nathaswamy temple at Valgudi and Nataraja and Sivakami idols in

Siva temple at Thiruvidadasal. The cases are under further investigation.

PETHIDINE INJECTION MURDER

The Tamil Nadu Crime Branch, C.I.D. unearthed during the year, a dangerous criminal gang consisting of nine members under the leadership of Vaitheeswaran, a Pharmacist in Madras, who were responsible for a series of gruesome murders. The culprits posing themselves as Customs or Enforcement Officers selected their victims and killed them with heavy doses of pethidine injections under the pretext of giving "truth serum" and abandoned their bodies in far-off places after removing the heavy cash which they carried. The Crime Branch, C.I.D. arrested all the nine members of the gang and recovered gold ingots valued Rs. 23,500, gold jewels, sarees, etc., worth Rs. 45,000, cash Rs. 18,000 and seven cars and scooters all valued over Rs. 1,28,000. The case is now under trial.

Another notorious gang of wire thieves headed by Natarajan along with five associates was arrested by Tamil Nadu Crime Branch C.I.D. The ramification of this gang extended to Chingleput East, Chingleput West, South Arcot and Tirunelveli districts and a series of wire theft cases were detected.

NOVEL METHOD OF CHEATING

A novel method of cheating hundreds of youngsters on the

pretext of selecting new faces for a film proposed to be produced come to the attention of the Tamil Nadu Crime Branch, C.I.D. The culprits advertised in the dailies calling for new artistes under the caption : "PUDUMUGAM THEVAI" for acting in a new picture to be produced by 'SAFIRE FILMS OF INDIA, MADRAS.' On receipt of hundreds of applications from various parts of Tamil Nadu, Karnataka, Kerala, Andhra Pradesh, Orissa and Madhya Pradesh from aspiring youngmen and women, the culprits sent out invitations informing them of the inaugural function on 16th September, 1973 at Vijaya Gardens, Madras, and made them part with a sum of Rs. 50 each by money order. A substantial sum of Rs. 19,150 was thus collected from the applicants who received a rude shock, when they found that no such function was arranged. Six accused were taken into custody and investigation is proceeding.

A BOGUS DOCTOR

The Crime Branch, C.I.D. took into custody a youth who was practising medicine in the City with high sounding medical degrees. The culprit who was unemployed and educated upto the Secondary School level, posed himself as a doctor and started his medical practice at Kondithope, Madras under the Pseudonym Dr. R. M. Narayanan, B.S.C., M.B., B.S., M.D., Authorised Medical Attendant, General Hospital, Madras.

Who are the Physically Handicapped ?

In order to properly implement the scheme of helping the physically handicapped, a quick survey was conducted. The Quick Survey of the number and economic status of physically handicapped persons in Tamil Nadu has revealed the following facts :—

1. They number 2,34,313, of whom 1,35,073 are males and 99,240 are females.

2. As many as 1,66,210 handicapped persons are found in the rural areas, the rest numbering 68,103 only in urban areas.

The other main observations are :

(i) The incidence of handicapped population is 57 per thousand of the State population ;

(ii) The incidence of the physically handicapped varies from 29 per ten thousand in Madras to 76 per ten thousand in Tirunelveli District ;

(iii) As between males and females, the ratio of incidence is roughly 60 : 40 ;

(iv) as between rural and urban areas, the ratio is roughly 70 : 30 ;

(v) categorywise, the largest incidence has occurred in the case of orthopaedically handicapped who constitute about half of the handicapped population. About one third of the handicapped population are deaf and/or dumb and about one fourth blind ;

(vi) the incidence is more in the higher age groups. The incidence is about 50 per 10 thousand in persons below 30; 55 per 10 thousand in the age group 30-50 and it is as much as 102 per ten thousand in the age group 50 and above.

The definition of the 'Physically Handicapped' adopted for the present survey was similar to that of the 1961 census study (of 2 districts, Madras & Chingleput) and it included under its purview the following categories — blind, deaf, dumb, orthopaedically handicapped and any combination of these.

How many are they?

The schedules covering the various details of the physically handicapped were prepared by the Economic Analysis and Research Division of the Finance Department. The schedule by itself was self-explanatory but a form of instructions was also sent to each enumerator to avoid ambiguities and to ensure uniformity in the collection of the data. The survey was intended to be completed in a very quick time. As a result, the work relating to the conduct of the survey had to be very much decentralised involving gramasevaks, youth corps volunteers and other village and block development staff in the case of village and town panchayats and the local body staff in the case of Municipalities and Corporations. While the Panchayat Union Commissioners and the Municipal Commissioners were assigned the responsibility of supervision at the respective levels, the District Collectors were entrusted with the overall supervision.

For all practical purposes the present survey gives broad information on various socio-economic aspects of the physically handicapped population in Tamil Nadu.

THE INCIDENCE AND EXTENT

The survey reveals that there are 2,34,313 (roughly 57 per 10,000 of the population) physically handicapped persons, out of whom 1,35,073 are males and 99,240 females. The 1961 census study of physically handicapped persons conducted only in two districts, viz., Madras and Chingleput gave a figure of 142 per ten thousand. It is stated that allowing for a 20 per

cent margin of error, the true position may be that the handicapped persons may constitute 70 per 10,000 in our State.

Male and Female

As between the urban and rural areas—taking the Corporation, Municipality and Town Panchayat areas as urban and the rest as rural—handicapped population in the State is found to be more in the rural areas. There are 1,66,210 handicapped in rural areas as against only 68,103 in urban areas. If the rural and urban handicapped population are related to the total rural and urban population in the State, then the incidence of handicapped per given population is greater in rural areas than in urban areas. There are 63 handicapped in rural areas for every ten thousand of rural population as compared to 46 handicapped in urban areas for every ten thousand of urban population. In all, there are 57 handicapped persons for every ten thousand persons in the State. Similarly, if the male and female handicapped population are related to the total male and female population in the State, the incidence of handicapped among males is much higher than among females. There are 65 handicapped males for every ten thousand of male population as compared to the 49 handicapped females for every ten thousand of female population. The TABLE I gives the details of handicapped population in the State in respect of their rural, urban and male female distribution.

Incidence of the Handicapped — Districtwise

While the incidence of handicapped for the State as a whole works out to 57 per ten thousand of total population, it is found that there are wide variations as between different districts. The incidence varies from 76 per ten thousand in Thirunelveli district to 29 per ten thousand in Madras. The following districts have an incidence greater than the State average : Thirunelveli (76), North Arcot (72), the combined districts of Tiruchirappalli, Thanjavur and Pudukkottai (66), South Arcot (65), and Ramana-thapuram (59). The incidence

TABLE I

DISTRIBUTION OF HANDICAPPED PERSONS : SEXWISE
RURAL & URBAN

S. No.	Item	Number	Percentage	Incidence per ten thousand of respective Population
1.	Males	1,35,073	57.6	65
	(i) Rural	96,305	41.1	..
	(ii) Urban	38,768	16.5	..
2.	Females	99,240	42.4	49
	(i) Rural	69,905	29.8	..
	(ii) Urban	29,935	12.6	..
3.	Total Rural	1,66,210	70.9	63
4.	Total Urban	68,103	29.1	46

TABLE II

INCIDENCE OF THE HANDICAPPED PER TEN THOUSAND
POPULATION

District	Handicapped male per ten thousand male population	Handicapped female per ten thousand female population	Total Handicapped per ten thousand population
(1)	(2)	(3)	(4)
Madras ..	30	27	29
Chingleput ..	71	51	62
North Arcot ..	61	84	72
South Arcot ..	76	53	65
Dharmapuri ..	68	46	57
Salem ..	53	33	43
Coimbatore ..	46	33	40
The Nilgiris ..	49	35	42
Madurai ..	47	34	41
Thiruchirappalli } ..	81	54	66
Thanjavur } ..			
Pudukkottai } ..			
Ramanathapuram ..	69	50	59
Thirunelveli ..	88	64	76
Kanyakumari ..	85	51	68

in the following districts is below the State average : Madras (29), Salem (43), Coimbatore (40), The Nilgiris (42) and Madurai (41). The incidence in Dharmapuri district is equal to the State average. In all districts, the incidence for the male population is much higher than for the female population with the single exception of North Arcot District.

The TABLE II illustrates in detail the incidence of handicapped per ten thousand of population districtwise and for males and females.

Incidence of the Handicapped — Categorywise :

Conditionwise, the orthopaedically handicapped comprising the categories of polio, congenital deformities and amputees form the major portion numbering 1.15 lakh which is nearly half of the total handicapped population. Next in line comes the deaf and dumb — inclusive of deaf, dumb and deaf and dumb categories — numbering about 73 thousand which constitute 31 per cent of the handicapped population. The blind category comes third numbering about 46 thousand and constituting about 20 per cent of the handicapped. For the population in the State as a whole, there are 57 handicapped persons for every 10 thousand, of whom 28 are orthopaedically handicapped, 18 deaf and/or dumb and 11 blind.

The TABLE III illustrates the pattern of distribution of the handicapped categorywise.

Incidence of the Handicapped : Age groupwise

An age groupwise distribution of the handicapped population shows that the majority of them belong to the working age group of 16—50 constituting 45 per cent. While a considerable portion viz., 23.2 per cent of them belong to the age group of 6—16, almost the same percentage viz., 23 per cent of them are in the other end of the "50 and above" category. About 8 per cent of them belong to the age group below six. The TABLE IV illustrates the distribution of the handicapped population according to their age group and the incidence

of handicapped population to the corresponding age group of total population.

A direct relationship is noticed between the incidence of the handicapped and age. The highest incidence occurs in the age group of '50 and above' wherein the incidence is more than 10 per ten thousand population. It is 55 per ten thousand in the age group of 30—50 and 48 in the age group of 16—30. The exact population figures in the age group below 16 is not available and it is guessed that the incidence might be around 48 per ten thousand. Thus the incidence is much higher among persons aged above 30 years.

Educational Status

The incidence of illiteracy among the handicapped is found to be very much higher than the illiteracy level in the State in general. The literacy rate among the handicapped works out to about 39 per cent which is lower by about 10 per cent of the State average. Among the literates, many have not crossed the level of elementary education. Only about 6 per cent have reached the higher elementary standard, while only 3 per cent, the level of secondary education. Only one per cent of the handicapped have had higher education.

Employment Status

The employment status of the physically handicapped population truly reveals that their status is much lower than the average status enjoyed by the State population in general. Only about 2 per cent of them have been employed on a regular basis while 14 per cent on casual basis and the rest of them, constituting about 84 per cent remain unemployed. Those who are employed constitute only about 16 per cent of the total handicapped while the working population in the State constitute 35.7 per cent of the total population. If the persons falling in the age-groups of below 16 and above 50 are excluded the work-participation rate among the handicapped belonging to the age group 16—50 works out to 35.7 per cent as compared to the work participation rate of 70.8 per cent in the same age group for the State population as a whole.

TABLE III
DISTRIBUTION OF THE PHYSICALLY HANDICAPPED
CONDITIONWISE

S. No.	Condition	No.	Percentage to Total	Incidence per 10,000 of State population
(1)	(2)	(3)	(4)	(5)
1.	Polio	53,300	22.7	13
2.	Congenital deformities	25,474	10.9	6
3.	Amputees	36,454	15.6	9
4.	Deaf and Dumb	28,467	12.1	7
5.	Deaf	25,287	10.8	6
6.	Dumb	18,897	8.1	5
	Deaf and dumb 4+5+6	72,741	31.0	18
7.	Blind	46,121	19.7	11
	Unclassified	223	0.1	..
	Total	2,34,313	100.0	57

TABLE IV
DISTRIBUTION OF THE PHYSICALLY HANDICAPPED
AGE-GROUPWISE

S. No.	Age Group	Number	Percentage to Total	Incidence per 10,000 persons in respective age groups
1.	Below 6	19,637	8.4	50
2.	6—12	32,885	14.0	
3.	12—16	21,608	9.2	
4.	Sub-total (2L3)	54,493	23.2	
4.	16—30	51,992	22.2	48
5.	30—50	54,122	23.1	55
	Sub-total (4L5)	1,06,121	45.3	51
6.	50 and above	54,062	23.1	102
	Total	2,34,313	100.0	57

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Vice-President :

THIRU P. KASTHURI PILLAI

Treasurer :

THIRU S. PALANISWAMY, M.A.,

—oOo—

Authorised Share Capital	—	Rs. 2.5 crores
Paid up Share Capital	—	Rs. 2,09,07,300
Loan outstanding against Primary House Mortgage Societies and Building Societies	}	Rs. 12,40,07,729

Long term Loans for Construction of new houses, additions and improvements etc., repayable in twenty years are granted to individuals through the Primary House Mortgage Societies and the various types of Building Societies in Tamil Nadu for the following purposes.

MAXIMUM INDIVIDUAL LOAN

1. Construction of new houses	—	Rs. 25,000
2. Improvements, additions and alterations to the existing houses	}	Rs. 10,000
3. For minor repairs	—	Rs. 1,000

P. K. PATHMANATHAN, B.A., H.D.C.,
Joint Registrar and Secretary.

Nuclear Blast

Culmination of a Tough, Demanding Project

The success of Indian scientists in testing an underground nuclear device is the culmination of a sustained attempt at self-reliance in this most sophisticated and highly sensitive field of technology which has gathered about itself more awe than awareness. It has been a tough and demanding project for India. By the very nature of atomic energy and by the fact that in its initial stages in terms of know-how and technology, not much was available or forthcoming, an emphasis on self reliance was natural. The atomic energy effort in India began in 1948 and has throughout been sustained by a determined though costly effort to promote indigenous technology. It has successfully bridged the gap between process know-how and industrial production. The decision of the Department of Atomic Energy to rely on its own technology was thus a bold one and speaks volumes about the confidence reposed by it in indigenous technology.

THE NUCLEAR DICTIONARY

With India having demonstrated her nuclear capability, articles on nuclear science are frequently appearing in the press. The following glossary of nuclear terms will help readers :

Activation : The process of making a material radioactive by bombardment with neutrons, protons or other nuclear particles.

Atom : A particle of matter indivisible by chemical means. It is the fundamental building block of the chemical elements. The elements such as iron, sulphur, uranium etc. differ from each other because they contain different kinds of atoms.

Atomic Energy : Nuclear Energy: The energy liberated by a nuclear reaction (fission or fusion) or by radioactive decay.

Body Burden : Radioactive material may be absorbed by the body and retained. The total amount present at any time is said to be the body burden.

Boiling Water Reactor (BWR) : A reactor in which water is used as coolant and moderator and allowed to boil in the core. Steam is produced directly in the reactor vessel under pressure and in this state can be supplied to a turbine, but will be slightly radioactive.

Breeder Reactor : Popularly a nuclear reactor which produces more fissile atoms than it burns. Strictly

the term should be confined to a nuclear reactor which produces the same kind of fissile material as it burns, without specifying whether or not there is a net gain of fissile material. The new fissionable material is created by capture in fertile materials of neutrons from fission. The process by which this occurs is known as breeding.

Burn Up : The fraction or percentage of atoms in a reactor fuel which has undergone fission. Also the total amount of heat released per unit mass of fuel ; usually expressed in megawatt days per tonne (MWD).

Ceramic Fuel Elements : Usually refers to reactor fuel elements fabricated of uranium dioxide or uranium carbide. They are more resistant to radiation damage and can be used at higher temperatures.

Cladding : This term refers to a thin layer, usually of metal, which covers a solid fuel element in a reactor to prevent corrosion in the presence of the coolant, and to prevent escape of fission products. Aluminium or its alloys, stainless steel and zirconium alloys are common cladding materials.

Cloud Chamber : A device in which the tracks of charged atomic particles such as cosmic rays, x particles etc., are displayed.

Control Rods : Rods, plates or tubes of steel or aluminium containing boron, cadmium, hafnium

or some other strong absorber of neutrons. They are used to hold a reactor at a given power level, or to vary the rate of reaction. By absorbing neutrons, a control rod prevents the neutrons from causing further fission.

Coolant : A liquid or gas which is circulated through or about the core of a reactor to maintain a low temperature and prevent the fuel from overheating. If the coolant is very hot, it can be used to give power. Common coolants are water, carbon dioxide, liquid sodium and sodium potassium alloy.

Critical : Critical is the term used to describe the condition in which a chain reaction is being maintained at a constant rate, i.e., it is just self-sustaining.

Diffusion Plant : Plant for making uranium rich in the 235 isotope. The process is based on the fact that gas atoms or molecules with different masses will diffuse through a porous barrier or membrane at different rates. A large gaseous diffusion plant requires an enormous amount of electric power.

Fast Breeder Reactor : A reactor that operates with fast neutrons and produces more fissionable materials than it consumes.

Fast Neutron : Neutron resulting from fission that has lost relatively little of its energy by collision, etc. ; it has energy exceeding approxi-

mately 0.1 MeV *i.e.*, 100,000 electron volts and therefore travels at high speeds.

Fast Reactor : A nuclear reactor in which most of the fissions are caused by neutrons moving with the high speeds they possess at the time of their birth in fission. Such reactors contain little or no moderator to slow down the neutrons from the speeds at which they are ejected from fissioning nuclei.

Fertile Material : Isotopes capable of being readily transformed into fissionable material by the absorption of neutrons, particularly uranium-238 and thorium-232 ; (sometimes called source material). When these fertile material capture neutrons, they are partially converted into fissionable plutonium-239 and uranium-233 respectively.

Fissile : Capable of undergoing fission ; sometimes used to mean capable of fissioning when hit by a slow neutron, *e.g.*, the isotopes U///, Pu///, and Pu/// are fissile. Sometimes used as a synonym for fissionable.

Fission : The splitting of a heavy nucleus into two (or very rarely, more) approximately equal fragments—the fission products. Fission is accompanied by the emission of neutrons and the release of energy. It can be spontaneous, or it can be caused by the impact of a neutron, a fast charged particle or a photon.

Flux (Neutron) : In nucleonics, the product of the number of particles per unit volume and their mean velocity, *i.e.*, it is the number of neutrons passing through one square centimeter of a given target in one second.

Heavy Water (Symbol : (D/O)) : Water consisting of molecules in which the hydrogen is replaced by deuterium, or heavy hydrogen. It is present in water as about 1 part in 6,500 . It is used as a moderator in reactors because it slows down neutrons effectively and also has a low cross section for absorption of neutrons.

Hot Laboratory : A laboratory designed for the safe handling of radioactive materials.

Ion : An atom or molecule that has lost or gained one or more electrons.

Moderator : The material in a reactor used to reduce the energy, and hence speed, of fast neutrons, as far as possible without capturing them. Slow neutrons are much more likely to cause fission in a U/// nucleus than to be captured in a U/// nucleus so, by using a moderator a reactor can be made to work with fuel containing only a small proportion of U/// *e.g.*, ordinary water ; heavy water, graphite.

Neutron : A nuclear particle having no electric charge and the approximate mass of a hydrogen nucleus. It is found in the nuclei of atoms. Outside a nucleus a neutron is radioactive, decaying with a half-life of about 13 minutes to give a proton, an electron and neutrino. Neutrons sustain the fission chain reaction in a nuclear reactor.

Nucleus : The core of an atom which may be said to comprise protons and neutrons. It is very small and about 10/// cm in diameter (a millionth of a millionth of a cm). The detailed structure of nuclei is not fully known. The nucleus contains most of the atom's mass.

Plutonium (Symbol Pu) : The element No. 94, produced by neutron irradiation of U-238. Its most important isotope is fissionable plutonium-239, produced by neutron irradiation of uranium-238.

Reactor : Nuclear Reactor ; Atomic Reactor : A device in which a fission chain reaction can be initiated, maintained and controlled. Its essential component is a core with fissionable fuel. It usually has a moderator, a reflector, shielding and coolant and control mechanisms.

Reprocessing : The procedure of removing fission products from fuel before re-using it. One main aim is to remove poisons which would absorb and waste neutrons ; another is to remove mechanical stresses due to irradiation especially in the case of metallic fuels.

Somatic Effects of Radiation : Effects of radiation limited to exposed individuals as distinguished from genetic effects which also affects subsequent unexposed generations.

Power Reactor : A reactor designed to produce nuclear power.

Swimming Pool Reactor/Pool

Reactor : A reactor using water as coolant, reflector and moderator, usually ten or more feet deep so that the water is also a shield for the core which comprises sets of plates suspended deep into the pool, from above the water level. Often used for study of shielding problems, *e.g.*, for marine reactors, It is usually used for research and training.

Thorium (Symbol Th.) : Element No. 90 and atomic weight 232 ; a naturally radioactive metal, the mineral sources of which are widely spread over the earth's surface, particularly in monazite beach sands. It can be converted to uranium-233, an excellent nuclear fuel, by neutron irradiation.

Transuranic Elements : The artificial elements Nos. 93 and higher which have heavier and more complex nuclei than uranium. They can be made by neutron bombardment of uranium and are radioactive, *e.g.*, plutonium.

Tritium : The radioactive isotope of hydrogen of mass 3. It is very rare and can be made by the neutron absorption in lithium.

Uranium (Symbol U) : Radioactive element with the atomic number 92. Natural uranium contains both the heavier uranium isotope U///, which is a not readily fissile material, and is the parent material from which plutonium is created, and the lighter isotope of uranium, U///, which is the fission material or fuel of most reactors. In 140 parts of natural uranium, 139 parts are of U/// and one part only is U///. Uranium is the basic raw material for nuclear energy.

Van De Graaf Generator (Accelerator) : An electrostatic generator in which a high potential is produced by the accumulation of electric charge conveyed to an insulated conductor by a continuously moving belt. The potential generated is used for accelerating charged particles. Named after R. S. Van de Graaf who invented the device in 1931.

Zero-Power Reactor : An experimental reactor operated at such low power levels that a coolant is not needed and little radio-activity is produced.

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THE TAMIL NADU CABINET AND PORTFOLIOS OF MINISTERS

With the induction of two new Ministers and the exit of Thirumathi Sathyavani Muthu, the Tamil Nadu Ministry comprises sixteen Ministers with effect from 4—5—1974. The Portfolios of the Ministers are given below :

1. DR. M. KARUNANIDHI, .. Public, Finance, Planning and General Administration, as also Chief Minister (C.M.) matters relating to Indian Civil Service and Indian Administrative Service Officers, District Revenue Officers, Police, Elections and Film Technology.
2. DR. V. R. NEDUNCHEZHIAN, Education including Technical Education, Official Language, Minister for Education (M E&T) Legislature and Tourism and Tourist Development Corporation.
3. THIRU K. ANBAZHAGAN, .. Public Health, Medicine; Tamil Nadu Water and Drainage Board Minister for Health M (H) and Town Planning.
4. THIRU N. V. NATARAJAN, .. Backward Classes, Information and Publicity, Registration, Ex- Minister for Backward Classes Servicemen Prosperity Brigade, Youth Service Corps, Bhoodan M (BC) and Gramdan.
5. THIRU P. U. SHANMUGAM, .. Public Works, Minor Irrigation including Special Minor Irriga- Minister for Public Works M (W) tion Programme Works, Highways and Ports.
6. THIRU S. MADHAVAN, .. Industries, Textiles, Yarn, Handloom, Mines and Minerals, Iron Minister for Industries M (I) and Steel Control, Employment and Training, Companies, Law, Courts and Prisons.
7. THIRU S. J. SADIQ PASHA, .. Revenue, Board of Revenue, District Revenue Establishment, Minister for Revenue M (R) Deputy Collectors, Commercial Taxes, Prohibition and Excise, Revenues and Waqfs.
8. THIRU SI. PA. ADITHANAR, .. Agriculture, Food Production, Agricultural Engineering Wing, Minister for Agriculture M (A) Animal Husbandry and Agro-Engineering and Service, Co-operative Societies at all levels.
9. THIRU A. P. DHARMALINGAM, Municipal Administration, Community Development and Pan- Minister for Local Administra- chayatats and Panchayat Unions. tion, M (LA)
10. THIRU MANNAI P. NARAYA-.. Food, Co-operation and Agricultural Refinance. NASWAMY, Minister for Food & Co-operation M (F & C)
11. THIRU K. RAJARAM, .. Labour, Housing, Accommodation Control, Legislation on Weights Minister for Labour M (L) and Measures, Statistics and Slum Clearance Board.
12. THIRU C. V. M. ANNAMALAI, .. Social Welfare including Women's and Children's Welfare, Fishe- Minister for Social Welfare, ries, Beggars' Home, Orphanages, and Approved Schools and M (SW) Vigilance Service.
13. THIRU O. P. RAMAN, .. Electricity, Forests and Cinchona, Legislation on Moneylending, Minister for Electricity M (E) Rural Indebtedness, and Legislation on Chits.
14. THIRU S. RAMACHANDRAN, .. Transport, Nationalised Transport Motor Vehicles Tax, Stationery Minister for Transport M (T) and Printing and Government Press.
15. THIRU M. KANNAPPAN, .. Religious Endowments, Khadi and Village Industries and Rural Minister for Religious Endow- Industries Project, Milk, Operation Flood Project, and Tamil ments M (RE) Nadu Dairy Development Corporation.
16. THIRU N. RAJANGAM, .. Harijan Welfare, Indians Overseas and Refugees and Evacuees, Minister for Harijan Welfare Newsprint Control, Passports and Cinematograph Act. M (HW)

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FOR A REAL
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Tamil Culture

Kaveripoompattinam, known as Poompuhar in its more fortunate days was a well laid out port town which boasted of a separate settlement for the foreigners. Much of the archaeological remains still are there for us to see.

In addition, the recently constructed art gallery is the first attempt, after many centuries, at group-sculpture for which Tamil Nadu is justly famous. In the form of group-sculpture and also in individual figures a remarkable edifice to recreate the life and times of the Tamil classic "Silappathikaram" Story of the Anklet has come up at Kaveripoompattinam in its art gallery.

FOR FURTHER DETAILS

CONTACT:

RECEPTION OFFICER,

Poompuhar Art Gallery

[VIA] Sirkali, Thanjavur Dist.

