



July-September 1984

## MANGROVES AND FISHERIES

*(Article on page 3)*

## NARAKKAL SUCCEEDS IN ARTIFICIAL INSEMINATION OF TIGER PRAWN



Artificial insemination as a technique for improving the quality of livestock is now widely practised. In fish breeding artificial insemination has been effected by stripping the ripe males and females and mixing the milt and roe in containers to ensure fertilization of the eggs. But this simple procedure cannot be followed in the case of penaeid prawns due to complexity of the fertilization process. In prawns the sperms are packaged in spermatophores and these sperm packets are transferred to the female thelycum during mating. The female stores the sperms in the

thelycum for long periods and releases them simultaneously at the time of spawning the eggs. It is said that only the sperms which are stored in the thelycum for sometime acquire the capacity to fertilize the eggs. Hence direct mixing of sperms taken from males and eggs stripped from females does not lead to fertilization of the eggs. To circumvent this hurdle, a technique of extracting spermatophores from the male by electroejaculation and transferring the sperm packet to the thelycum of a newly moulted female has been developed at the Narakkal Prawn Hatchery Laboratory of

the CMFRI by Shri M. S. Muthu, Scientist S-3 and Dr A. Laxminarayana, Scientist S-2. Using this method, artificially inseminated tiger prawn *Penaeus monodon* has been made to mature and spawn viable eggs in the laboratory and the nauplii that hatched out have been successfully reared to the post-larval stage. This is a major breakthrough which opens up new vistas in genetic improvement of prawn stocks for culture purposes by selective breeding and hybridization. The method is described in a paper which has been published in *Current Science* 53, (20), 1984.

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The occurrence of mangrove forests and swamps in the intertidal regions is characteristic of the tropical coastline. The word mangrove refers to the community of salt loving trees and shrubs which colonise soft muddy shores bordering protected bays, lagoons, backwaters and river estuaries. Wherever they have developed as forests, they are the concern of forest and revenue departments and in other places where their formation has been reduced to shrubs and marshes they are considered as wasteland or derelict forests. The important role the mangroves play in nature and their ecological significance have been realised of late and the Government, the scientific institutes and universities are paying increasing attention to the biology, conservation and management of mangrove areas. The Department of Environment has constituted a National Mangrove Committee in which Dr E. G. Silas, Director is a Member. CMFRI's team on mangrove investigations led by Shri M. S. Rajagopalan has carried out surveys of the important mangrove areas such as Andaman and Nicobar islands, Gulf of Kutch, Cochin and Killai backwaters, Kakinada and Tuticorin for understanding the characteristics of the ecosystem with special reference to fish and fisheries.

The long coastline of our country is blessed with extensive estuarine areas of large rivers, backwaters and lagoons and one would therefore expect extensive mangrove areas. But as per a recent estimate, the extent of mangrove areas in the mainland coasts is about 256,000 ha and in

the Andaman Nicobar islands it is about 100,000 ha. This is a small fraction when compared to the estimated area of about 10 million ha in the Indo-west Pacific region.

In India, one of the richest

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mangrove formations occurs, in the Sunderbans in the estuarine areas of Hoogly and Matla river system where the mangroves extend to about 100 miles inland from the coastal area. Next in importance are the rivermouth regions of Mahanadhi, Godavari, Krishna and Coleroon. Along the west coast, mangrove formations of lesser extent occur around Gulf of Kutch, Gulf of Cambay and as isolated patches of shrubbery or tree forms in the estuaries of Mandovi-Zuari, Nethravathi and the Cochin backwaters. Among



Lithograph of Mangroves near Goa, on the west coast of India, at ebb tide  
Source: Davis Ainsworth. J. R. 1907. Science in Modern Life.  
(from Dr P. Vijayaraghavan's collection)

these the mangrove of the Andaman Nicobar islands are comparatively well preserved.

### Economic Importance

The importance of mangrove to mankind has to be viewed from different angles. As a forest resource of economic importance, mangroves have been exploited rather indiscriminately for timber, fuel wood, charcoal and extraction of tannin from barks. Mangrove foliage is used as feed for cattle and camels.

The essential constituents of mangrove flora are trees and bushes comprising only a small number of species under the genera such as *Avicennia*, *Rhizophora*, *Bruguiera*, *Aegiceras*, *Excoecaria*, *Clerodendron* and *Acanthus* but representing families not very nearly related to one another. These plants with their anchoring and radial roots, breathing roots and proproots help in conso-

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*Mangroves assume great importance in the context of coastal aquaculture for production of finfish and shellfish. Many of the cultivable species such as milk fish, mullets, seabass, prawns and crabs occur in mangrove areas and this could lead to utilising such areas by man for more productive purposes.*

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olidating the loose muddy soils and build up a natural barrier between the tidal action from the sea and floods from the river. The dense stands of mangrove canopy help in minimising the fury of physical forces such as cyclones and storms.



*Oyster encrusting on mangrove proproots in the inter-tidal region*

### Mangroves and Fisheries

The swampy areas formed by the mangroves and the net work of canals, creeks and waterways in estuarine areas attract a large number of fish, prawns and molluscs especially in the critical stages of their early life history and provide shelter and food. In addition to these visiting fauna, the mangroves have their own characteristic resident fauna belonging to both aquatic and terrestrial environments, consisting of aquatic birds, mammals and reptiles at the higher trophic levels and fish, crustaceans, filter feeders, and phytoplankton at the lower levels. The considerable quantities of litter fall from mangroves and their degradation by fungi and bacteria enriches the surrounding water bodies with detrital food which not only sustains the food web within the ecosystem but also enriches the adjoining inshore marine environment on which coastal fisheries are dependent.

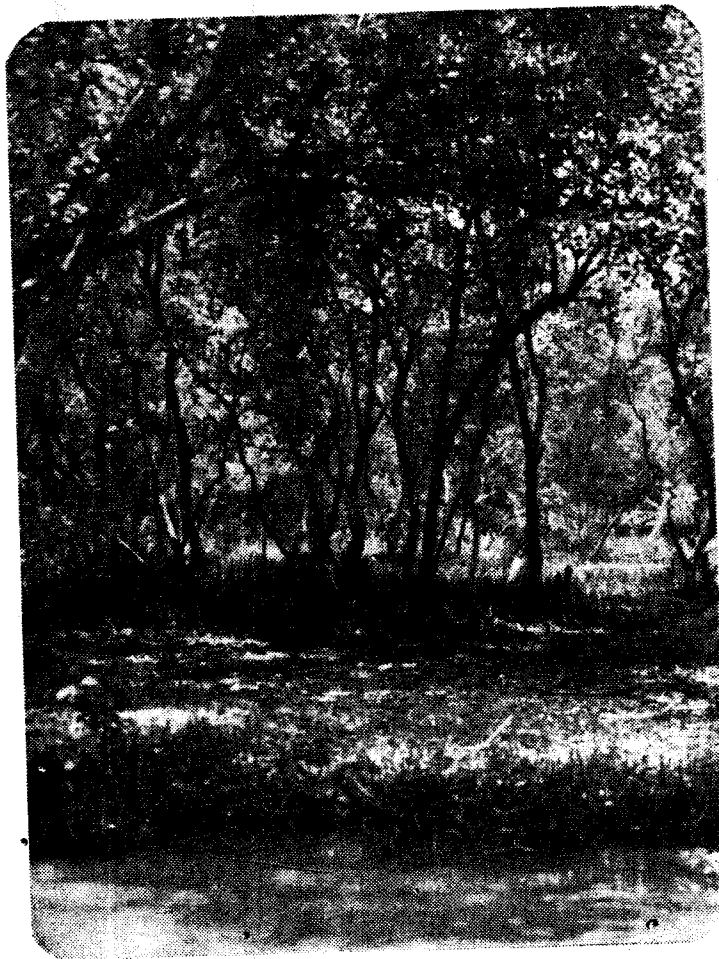
The migratory habits of fish and prawns along with tidal inflow and outflow in mangrove areas are exploited by local fishermen who operate fixed stake nets, bag nets, or use cast nets for a sustenance type of fishery. The migration of juveniles of prawns and fish into the mangrove areas is taken advantage of in the traditional methods of coastal aquaculture as it is practised in Kerala and West Bengal. In South East Asian countries the system of converting mangrove areas (Tam-bake) for milk fish culture has been in vogue since a long time.

Mangroves assume great importance in the context of coastal aquaculture for production of finfish and shellfish. Many of the cultivable species such as milk fish, mullets, seabass, prawns and crabs occur in mangrove areas and this could lead to utilising such areas by man for more productive purposes.

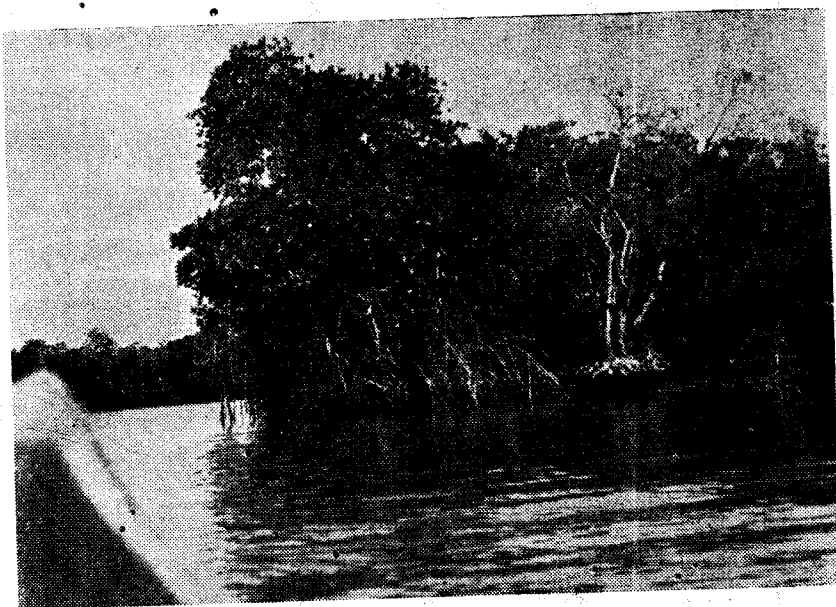
The Pichavaram mangroves in the Killai backwaters (Tamil Nadu) comparatively rich with 10-15 species of mangrove flora spreading to an approximate area of 10,000 ha are one of the best studied mangroves in the marine environment. The meandering waterways and creeks support abundant quantities of post larvae and juveniles of cultivable species of penaeid prawns, mullets, pearl spot and milk fish and the area is recognised as one of the richest for seed resources. From the adjacent sea more than 100 species of commercially important fishes ingress into the mangrove canals which are exploited by the village fishermen. The FAO/BOBP has a project in this area to help the local fisherman in the culture of prawns in pens. This area would provide an ideal situation for coastal aquaculture if proper farm management systems with measures to protect the mangroves are worked out.

#### **Mangroves as sanctuary for wildlife**

Mangroves forests also afford sanctuary for wildlife. The Sunderbans forests shelter the famous Bengal tiger, wild pig, rhesus monkey among mammals; king cobra,



*Deforestation of mangroves due to indiscriminate felling*



*Soil erosion in the inter-tidal region affecting the mangroves  
(Note tree in the foreground)*

python, lizards, monitor and crocodiles among reptiles. The Bittorkanika sanctuary in Orissa is famous for its marshy crocodile farm. The aquatic birds are represented by sea-gulls, open bill storks, pelicans, ibis, herons, egrets etc. The migratory flamingos annually visit the swamps of Kutch and Point Calimere for nesting and feeding.

#### **A versatile ecosystem in jeopardy**

The versatile ecosystem which is of importance to mankind has been in jeopardy due to tremendous human pressure. The large scale felling,

*(Continued on page 9)*



## Training in Use of Fish Finding Devices and Biomass Estimation

CMFRI organized a training course in Acoustic Methods for fish Detection and Abundance Estimation from 12-25 September at Cochin. This training, organized under the project Training in Application and Operation of Acoustic Equipment for Fishery Scientists led by Shri S. Natarajan, is the first of its kind to be held in the country. Among the many techniques employed in marine fishery resources assessment acoustic methods have several advantages in making biomass estimation of different fish populations in relatively short time. This is one of the important methods used in the

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Nineteen scientists from the ICAR fisheries institutes, CIFNET, agricultural and other universities participated in the training. The course curriculum included basic principles and application of electricity, elect-

ronics, acoustic instrumentation, acoustic survey and fishery oceanography.

The training was inaugurated by Dr C. T. Samuel, Head of the Department of Industrial Fisheries, University of Cochin. Dr V. K. Aatre, Director, Naval Physical Oceanographic Laboratory, Cochin gave the valedictory address. Dr Aatre in his address said that the major part of the oceanographic work was achieved during this century and a large part of work was motivated by defence and strategic requirements. Following are the excerpts from the address.



*Modern acoustic instruments for fish finding.*

“Over the last two decades oceanographic work has taken on new dimensions. With the dwindling energy and food resources on land, man has diverted his attention to the ocean for energy and food. With the extended 200 mile EEZ, the coastal states have become more aware of the potential riches from the seas. Though the traditional methods of fishing are still sustaining, they have their limitations and with increase in demand for food and other resources from the sea, the emphasis has been on developing new technologies for efficient exploitation of the resources from the sea. Acoustics and use of it for underwater detection and estimation is at the hub of many developments.

The behavioural and physiological understanding of fish is critical to the design and interpretation of new acoustic experiments which must precede the development of improved instrumentation. Application of acoustics to the fisheries requires the unified use of three techniques (1) deterministic mathematical models based on the physiology of fish (2) statistical description of the random distribution of fish and (3) the willingness to use more sophisticated instrumentation.

The characteristics of individual fish are deterministic. That is, the acoustic features of the fish as targets can be directly inferred from the mathematical models based on their physiology and behaviour. The acoustic consequences of fish grouping can be separated into three classes depending on the density of the fish

low, medium and high. Estimation of number of fish is done directly or indirectly depending upon the density of fish distribution.

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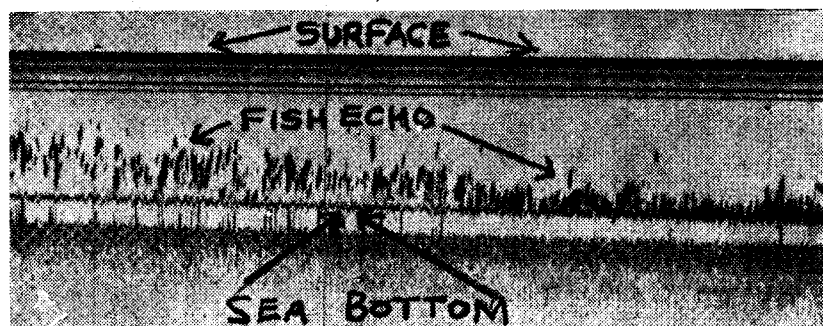
Identification of species is a significant problem on which a number of new acoustic



methods can be employed and lot more is to be done in this regard. There have been some important studies on this in certain countries namely England and Japan.

Fishing, aquaculture, deep sea mining and pollution monitoring are activities which require urgent scientific consideration. Surely, ocean has great impact on a densely populated country like ours. Oceans are ours to use but we must use them wisely. Many problems with oceans need better research for we have learned from Bacon, “Nature to be commanded must be obeyed.”

Use of echo sounders and sonars for fish detection and scientific studies in Indian waters was initiated in the late fifties by the vessels of the erstwhile Indo-Norwegian Project. Typical echogram patterns of some of the important commercial species and groups have been available from these studies. Extensive surveys for the important fish resources of the south-west coast of India were carried out by the Pelagic Fishery Project from 1971 to 1978. These surveys using echosounder, sonar and echo integrator estimated the biomass of standing stocks of different fish resources.

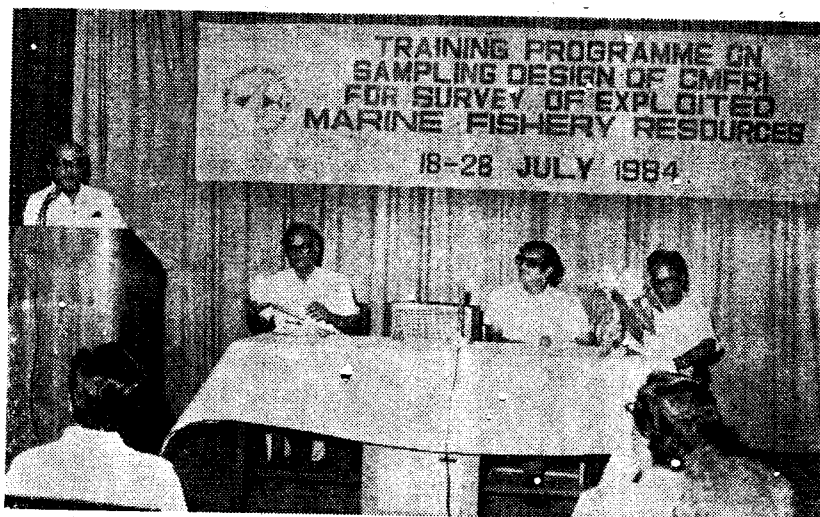


A typical echogram of a mixture of golden scad and silver bellies from the inshore waters of the southwest coast of India. (An echogram is a graphical representation of the ecosignal reflected by the fish)

## Training in Sampling Methods

A training on the sampling methods for collection of data and estimation of marine fish landings was held at CMFRI during 18-28 July for the officials of the state fisheries departments. This was organized as per the recommendations made at the meeting of the chief ministers and fisheries ministers of maritime states held in Hyderabad in June, 1983. The multistage stratified random sampling design developed and followed by CMFRI was found to be most suitable for collection of fish catch statistics and adoption of this method by the agencies involved in the estimation of marine fish landings would help in standardising the sampling method and streamlining the process of data collection.

Twenty participants from various maritime states and



*Dr E. G. Silas, Director, CMFRI speaking at the valedictory. Seated are Shri Chandrasekhar, IAS and Dr K. Alagaraja and Shri S. K. Dharma Raja, Scientists, CMFRI*

union territories were trained in the first batch. The curriculum included basic theory on sampling and sampling methods for estimation of fish landings and practicals on preparation of field programmes

and field collection of data.

Dr E. G. Silas, Director, CMFRI inaugurated the training. Shri K. M. Chandrasekhar, IAS, Director of Fisheries, Kerala was the Chief Guest for the valedictory function.

## Inservice Training for Technical Staff

To appraise the technical staff of various categories at CMFRI of their role and expose them to various R & D activities CMFRI organized the first training programme at Cochin during July. Thirtyfive technical staff drawn from various research centres and field centres of CMFRI participated in the training. A need for such a training for technical staff, who form an important base for the scientific programmes, was expressed at the Joint Staff Council meeting. While inaugurating the course, Dr E. G. Silas, Director, said that the training would help focusing attention on the role played by the individual technical staff, and make them understand the utility of the

data collected by them. Dr Silas said that CMFRI proposes to continue this course and the second course will be conducted early 1985. The ten-day training explained the objectives and activities of CMFRI, ICAR office procedures and resource assessment methods. Special lectures on developing the communication skill and motivation for work were given by Dr D. Devesh Kishore and Dr K. V. Subba Rao of National Academy of Agricultural Research Management, Hyderabad.

### **Zonal Workshop of the Survey Staff**

The Zonal workshop of the survey staff of CMFRI posted in the various maritime states

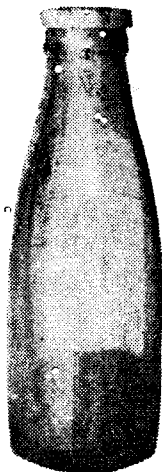
of India was held during 10-20 September at Waltair, Madras, Mangalore and Bombay

The workshop was attended by the field staff, senior scientific and technical staff of the FRA Division and the officers-in-charge of the concerned research centres.

The major points discussed were unified sampling procedure for collection of data, timely submission of reports, appraising headquarters of the events of importance and updating the list of landing centres.

Problems faced by the field staff in the collection of data at the fish landing centres were also discussed.

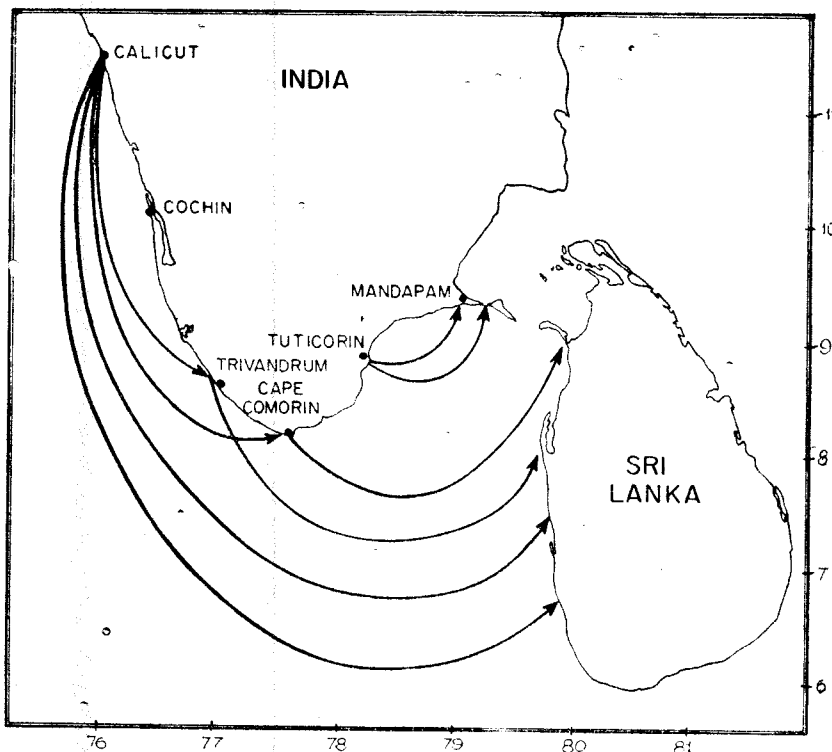




*The Drift Bottle*

A dozen of drift bottles released off Calicut in April have been recovered from the north-east coast of Sri Lanka in July. This is an evidence to show that the coastal current at that time goes past Sri Lanka. CMFRI has been releasing drift bottles all along the Indian coast to study the coastal current.

## Drift Bottles Recovered from Sri Lanka



*(Continued from Page 5)*

of mangroves for timber, poles, firewood and charcoal has considerably eroded its extent in Sunderbans, Gulf of Kutch and other areas. The continuous removal of leaves for fodder has denuded even shrubby mangroves in Gujarat. Large extent of mangrove swamps have been reclaimed for residential flats, industrial estates, harbour extension and docks as in Bombay and Cochin.

In the Cochin estuarine system, mangrove areas have been progressively converted into coconut groves, paddy and prawn culture fields. The construction of barrages and bunds for irrigation have brought about imbalances in

the mangrove ecosystem in a number of estuaries.

Common sources of marine pollution such as oil spillage from tankers, sewage, effluents from industries and agriculture pesticides have also been a threat to the mangrove fauna.

The destruction of mangroves will affect the natural habitats of reptiles, aquatic birds and mammals, some of which are endangered species.

### Visitors

#### Tuticorin

N. Cdr. S. C. Rampal,  
Commanding Officer,  
Bihar Naval Unit NCC  
Patna.

Shri N. K. Vasudevan,  
Principal,  
Fisheries Staff Training  
Institute, Madras.

Shri H. Mahmood,  
Manager, Coastex,  
New Delhi.

Shri V. N. Srinivasan  
Superintendent of Police,  
Tirunelveli (West).

Shri S. R. Sunil Kumar  
S P I C,  
Tuticorin.

Shri D. Rajasekhar Kamak  
17, Great Cotton Road,  
Tuticorin.

Shri C. P. Singaram,  
District & Sessions Judge,  
Tirunelveli.

Shri R. Vasudevan,  
Special Deputy Collector (RS)  
Tirunelveli.

Shri K. R. Veeraswami,  
Chief Judicial Magistrate,  
Tirunelveli.

Miss Zohra Fatima,  
Leader Coastex,  
Karol Bagh, New Delhi.

Shri G. K. Menon,  
Bangalore.

Dr D. A. Chandra Bose,  
Professor & Head of  
Department of Zoology,  
Scott Christian College,  
Nagercoil.

Sr Dona,  
Holy Cross College,  
Tiruchirapalli.

Shri A. Sunderesan,  
Peacock Oil Manfg. Co.,  
Virudhunagar.

Sr S. Antoniammal,  
Headmistress,  
St. Ignatius Higher Secondary  
School, Palayamkottai.

Shri Ashwin Muthiah,  
Loyola College,  
Madras.

## Cochin

Dr A. G. Kalawar, Kerala  
Fisheries Expert Committee,  
"Ban on Trawling"-Kalawar  
Committee.

Mr Wilfred Vogeler, Mini-  
ster, Embassy of Federal Re-  
public of Germany, New Delhi.

## Mangalore

Shri B. Laxman, Agriculture  
Project Officer, Syndicate Bank,  
Karnataka Regional Office,  
Mangalore.

Shri B. Venkatesh and Shri  
Raghavendra, Development  
Officers, NABARD, Bangalore.

Shri B. Jacob, Deputy  
Director, Export Inspection  
Agency, Mangalore.

Shri P. M. Madhusudhan,  
Professor and Head of Zoology  
Department, Shri Narayana  
College, Nattika.

## CMFRI Wins Best-Pavilion Award

The Pavilion put up by the  
Madras Research Centre of  
CMFRI was adjudged the best  
among the 65 pavilions and  
was awarded the rolling trophy  
in the exhibition jointly orga-  
nized by the All India Radio,  
and the Committee on Science  
and Technology in Developing  
Countries (COSTED) at Madras  
in connection with the Fourth  
Science Samelan. The exhibi-  
tion was organized at Indian  
Institute of Technology, Madras  
from 1-10 September with the  
objective of creating awareness

about the scientific develop-  
ment in India among the masses  
and to highlight and popularise  
the fundamentals of science  
and technology. Other parti-  
cipating organizations included  
CSIR laboratories, transport  
and oil corporations, Depart-  
ment Food, Small Scale Indus-  
tries, Electricity Board, Public  
Health Directorate and Viswes-  
warayya Museum. The rolling  
trophy for this year was insti-  
tuted by Madras Refineries  
Ltd., Manali.



Shri K. Rangarajan, Officer-in-Charge,  
Madras Research Centre receiving the trophy

## Staff News

### Engagements

Dr E. G. Silas, Director att-  
ended the following.

Meeting of the ICAR Panel  
for Fisheries at New Delhi, 3  
July

Meeting of the Directors  
of Fisheries Institutes and Pro-  
ject Coordinators under ICAR  
at New Delhi, 4 July.

First Meeting of the Rese-  
arch and Development Forum  
on Fisheries at ICAR, New  
Delhi, 5 July.

Meeting of the Sea Turtle  
Specialist Group of the Depart-  
ment of Environment at New  
Delhi, 11 July.

Workshop on Reorientation of Zoology Programme at Madras University at the Christian College, Madras, 12 July.

Meeting convened by the Department of Ocean Development regarding finalization of national cruise programme of research vessels *Gaveshini*, *Sagar Sampada* and *Sagar Kanya* at New Delhi, 10 July.

Meeting of the ICAR Ad-hoc Committee to examine the norms of recurring contingencies during the VII Plan at New Delhi, 17 August.

First meeting of the Committee on Introduction of Exotic Fishes at CIFRI, Barrackpur, 19 August.

Meeting of the Committee constituted by the Director General, ICAR under the chairmanship of Deputy Director General (Education) for formulation of policy for ICAR publications at Delhi, 25 August.

Meeting of the Director General, ICAR with the Secretary, Department of Agriculture regarding Pelagic Fisheries Laboratory at New Delhi, 10 September.

Meeting of the Standing Committee for coordinating the function of the Fisheries Institutes under the Ministry and ICAR at New Delhi, 10 September.

Meeting of the Bureau of Fish Genetics for deciding organizational set up at Allahabad, 10 September.

ICAR has nominated Dr E. G. Silas, Director as a member of the Committee to consider the question of introduction of new species of fish into the country.

Dr P. V. Ramachandran Nair, Scientist S-3 attended the Inter Agency Workshop for preparing cruise plans of ODV *Sagar Kanya* and R V *Gaveshini*, 2-4 July.

Dr K. Satyanarayan Rao, Scientist S-3 participated in the management training at NAARM, Hyderabad, 18-28 September.

Shri G. Subbaraju, Scientist S-2 has been nominated to serve as member of Peer Group VI on Oceanography, Marine Resources and Coastal Engineering of National Natural Resources Management System (NNRMS)

Shri Subbaraju has also been nominated to serve as member of Planning Commission's Task force on Remote Sensing in Oceanography, Marine Resources Management and Cost Studies.

### Management Committee Meeting

The sixteenth meeting of the Management Committee of CMFRI was held on 30 July. The following members attended the meeting.

Dr E. G. Silas, Director  
Dr P. V. Ramachandran Nair, Scientist S-3  
Dr M. J. George, Scientist S-2  
Dr M. V. Pai, Scientist S-3  
Shri P. T. Meenakshisundaram, Scientist S-2  
Shri V. K. Sridar, Administrative Officer

### Meeting of the Institute Joint Council

The fifth meeting of the Institute Joint Council was held on 19 July and the following members attended the meeting.

Dr E. G. Silas, Chairman

#### Members

Dr M. J. George  
Shri S. Mahadevan  
Shri M. Kumaran  
Shri M. P. Chandrasekharan  
Shri V. K. Sridhar (Secretary, official side)  
Shri T. N. Padmanabha Kurup (Secretary, staff side)

Smt Krishna Srinath, Scientist S-1 visited Bay of Bengal Project at Madras for discussion on audio-visual production for fisheries extension, 3-5 September.

### Training abroad

Shri M. Vijayakumaran, Scientist S-2 has been deputed for six-month training in aquatic pathobiology at the University of Stirling, Scotland.

### Assessment

The following Field / Farm Technicians - Category I & II have been promoted (With effect from 1 July, 1983)

#### T-1 - T-2

Shri T. Krishnankutty  
Smt K. K. Valsala  
Shri K. Chellappan  
Shri K. Chandran

Shri K. K. Balasubramanian  
Shri K. C. Yohannan  
Shri Joseph Andrews  
Shri M. Abdul Nizar  
Shri M. Ganapathy  
Shri S. M. Hussain  
Shri P. A. Vasu  
Shri S. Thiagarajan

Shri Mathew Joseph  
 Shri M. N. Kesavan Elayathu  
 Smt T. A. Omana  
 Shri K. K. Surendran  
 Shri K. Narayana Rao  
 Shri M. Chandrasekhar  
 Shri C. S. Sasidharan  
 Shri V. Achutha Rao  
 Shri C. Manimaran  
 Shri N. Vaithinathan  
 Shri G. Arumugham  
 Shri S. Rajapackiam  
 Smt P. Swarnalatha  
 Shri G. Srinivasan  
 Shri M. Chellappa  
 Shri A. Ramakrishnan  
 Shri T. Dhandapani  
 Shri M. Bose  
 Shri J. Narayanaswami  
 Shri K. T. Thomas  
 Shri Saileda Satya Rao  
 Shri A. K. Velayudhan  
 Shri P. Poovannan  
 Shri P. Venkatakrishna Rao  
 Shri A. Prosper  
 Shri N. Varatharajan  
 Shri K. Rathna Kumar (1 Jan, '83)  
 Shri V. Vedanayagam  
 Shri P. Muniasamy  
 Shri V. Maria Alwaris

#### T-2—T-1-3

Shri K. P. Viswanathan  
 (1 Jan, '83)  
 Shri V. Sivaswamy  
 Shri N. Palaniswamy  
 Shri T. Chandrasekhara Rao

#### T-II-3 - T-4

Shri E. Johnson (1 Jan, '83)  
 Shri K. L. K. Kesavan  
 Shri A. Agastheesa Pillai  
 Mudaliar  
 Shri K. K. Balasubramanian  
 Shri K. V. S. Seshagiri Rao

The Following have been  
 granted advance Increments  
 with effect from 1 July, 1983.

#### T-1

Shri M. Manivasagam  
 Shri S. Sankaralingam  
 Shri R. Somu  
 Shri M. Radhakrishnan  
 Smt V. K. Janaki  
 Shri M. P. Sivadasan  
 Shri V. G. Surendranathan

Shri C. J. Sosekutty  
 Shri M. K. Gopalakrishnan  
 Shri K. S. Leon  
 Shri E. Sivanandan

#### T-2

Shri C. K. Dhandapani  
 Shri O. M. M. J. Habeeb

#### Appointments

Shri N. Rajamuniswamy,  
 Assistant as Superintendent at  
 TTC, Narakkal, 7 August.

Smt D. Geetha, Junior  
 Stenographer as Stenographer  
 at TTC, Narakkal, 1 September.

Shri M. Ganapathy, Senior  
 Clerk as Assistant at Cochin,  
 12 September.

Shri R. Thankappan, Senior  
 Clerk on ad-hoc basis as Senior  
 Clerk on regular basis at Cochin,  
 13 September.

Shri S. M. Yousuff, Supp-  
 orting Staff Grade II as Supp-  
 orting Staff Grade IV (Lab  
 Attendant) at Mandapam Camp,  
 14 August.

Shri M. Anbu as Suppor-  
 ting Staff Grade I (Messenger)  
 at Madras, 2 July.

Shri R. Raveendranathan  
 Nair as Supporting Staff Grade  
 I (Messenger) at Cochin, 16  
 July.

Shri M. R. Anjalo as Su-  
 pporting Staff Grade I (Watch-  
 man) at KVK, Narakkal, 23 July.

#### Transfers

Shri S. Muthusamy, Scie-  
 ntist S-1 from Karwar to Cochin.

Smt T. S. Naomi, Scientist  
 S from Karwar to Cochin.

Shri S. S. Sugawekar, Field  
 Assistant (T-1) from Cochin to  
 Ratnagiri

Shri S. Ramadoss Gandhi,  
 Junior Technical Assistant (T-2)  
 from Ratnagiri to Bombay.

Shri S. D. Kamble, Field  
 Assistant (T-1) from Bombay  
 to Dahanu.

Shri K. Srinivasagam, Field

Assistant (T-1) from Madras to  
 Tuticorin.

Shri R. Thangavelu, Tech-  
 nical Assistant (T-I-3) from  
 Tuticorin to Madras

Shri M. Rengan, Cook  
 (Boat) (T-1) from Tuticorin to  
 Mandapam Camp.

Shri G. V. Pednekar, Supe-  
 rintendent from Tuticorin to  
 Cochin.

Shri P. Ganesan, Assistant  
 from Vizhinjam to Cochin.

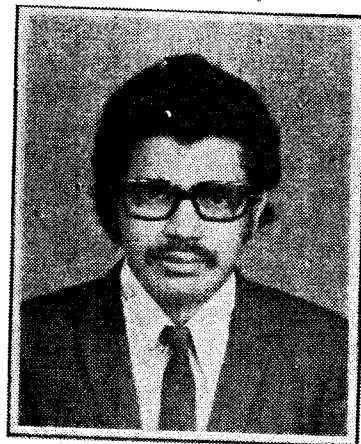
Shri S. Mani, Supporting  
 Staff Grade III (Fieldman) from  
 Tuticorin to Mandapam Camp.

Shri P. Mahalingam, Supp-  
 orting Staff Grade II (Watch-  
 man) from Vizhinjam to Tuti-  
 corin.

Shri R. Madhusudhanan  
 Nair, Supporting Staff Grade I  
 (Watchman) from KVK, Narak-  
 kal to Vizhinjam

Shri C. M. Rajappan, Supp-  
 orting Staff Grade III (Lab  
 Attendant) from Mandapam  
 Camp to Vizhinjam.

#### Ph D Awarded



Shri S. Lazarus, Scientist S-2  
 has been awarded Ph D in  
 Aquatic Biology and Fisheries  
 by the Kerala University. His  
 thesis was on the Sardines of  
 South-West Coast of India.  
 Shri Lazarus worked under the  
 supervision of Dr M. D. K. Kuth-  
 alingam, Scientist S-3, CMFRI.

## Sports

### Atchutha Rao Retains Championship

Shri V. Atchutha Rao of Palasa Field Centre retained the Athletic Champion Award for the third time in succession. In the fourth ICAR zonal sports held at Trivandrum hosted by CTCRI from 24-29 September, he sprinted first in 100, 200 and 400 m breaking the previous meet records set by him.



*Shri Atchutha Rao - A wonderful performance on the track*

His wonderful and consistent performance on the tracks with his inimitable rhythmic gallops proved beyond doubt his dedication and devotion to sports. Shri A. Kumar, the favourite in highjump, belied hopes and gained second place. Shri L. K. Suvarna who came second in 5 km cycling race missed the first place by a few cms. In pole vault Shri M. Alfred bagged the third prize. The CMFRI's 4 x 100 m relay team

represented by V. Atchutha Rao, M. Radhakrishnan, G. K. Rajan and A. Kumar won the third place. The volleyball, badminton and table tennis teams of CMFRI played well. The CMFRI contingent of 23 players had presented a satisfactory performance.

The Fifth ICAR Inter-Institutional Sports meet is proposed to be held at Cochin, to be hosted by CMFRI, during 1985.



*The CMFRI contingent*

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### Reliefs

Shri L. Joebai Fernando, Oilman-cum - Deckhand (T-2) on resignation, 13 June.

Shri Johnson K. Kuriakose, Engine Driver (T-II-3) on resignation, 8 June.

Shri R. G. Kavitar, Field Assistant (T-I) on resignation, 2 May.

Shri C. Gangadharan, Bosun (T-II - 3) on resignation 25 May.

### Weddings

Kumari A. Rajeswari Menon, Hindi Translator (T-4) at Cochin married Shri Krishnan at Ernakulam, 9 July.

Shri A. Y. Jacob, Fieldman at Cochin married Kumary P. S. Mary at Azheekal, 9 September.





*View of one of the mangrove areas in Geshin backwaters*