

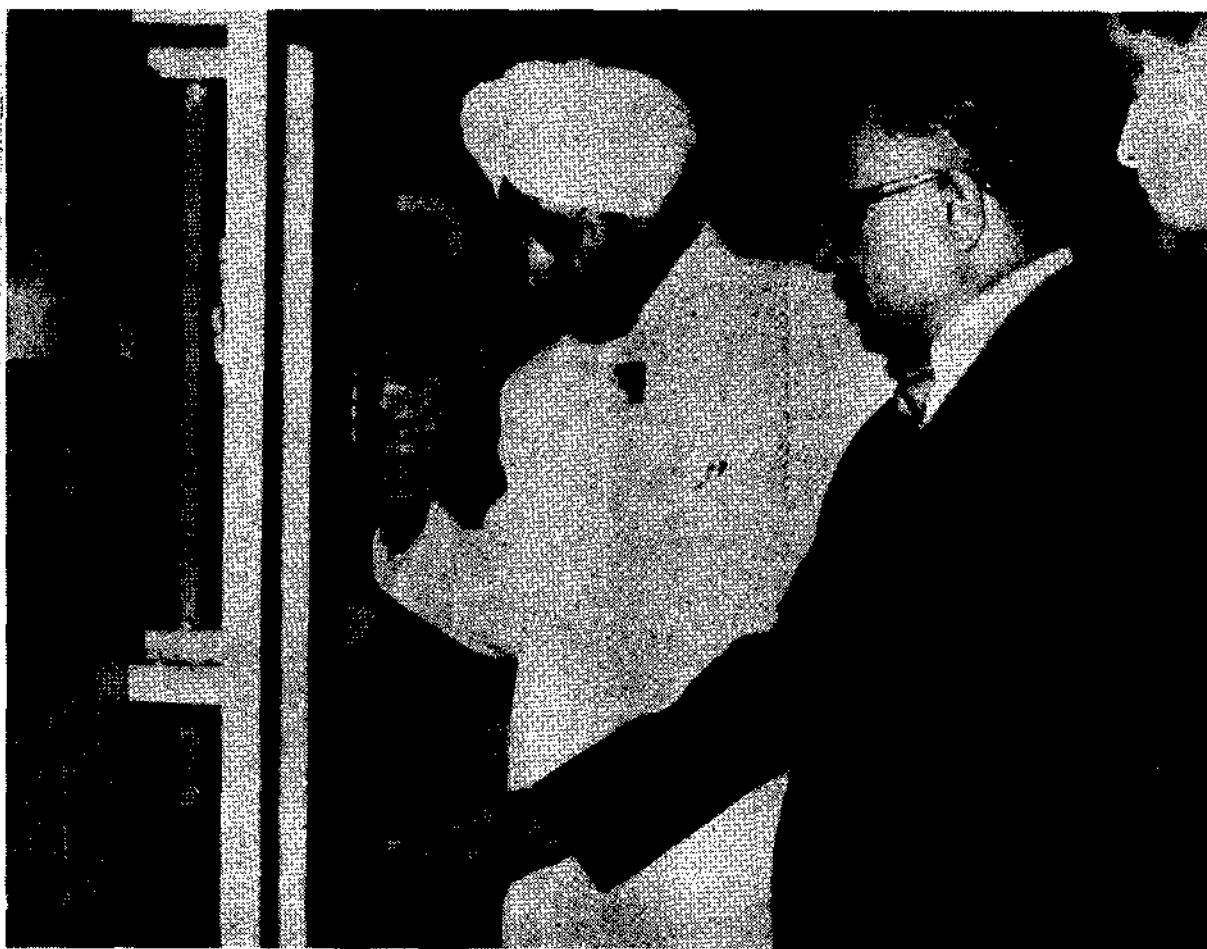


CMFRI newsletter

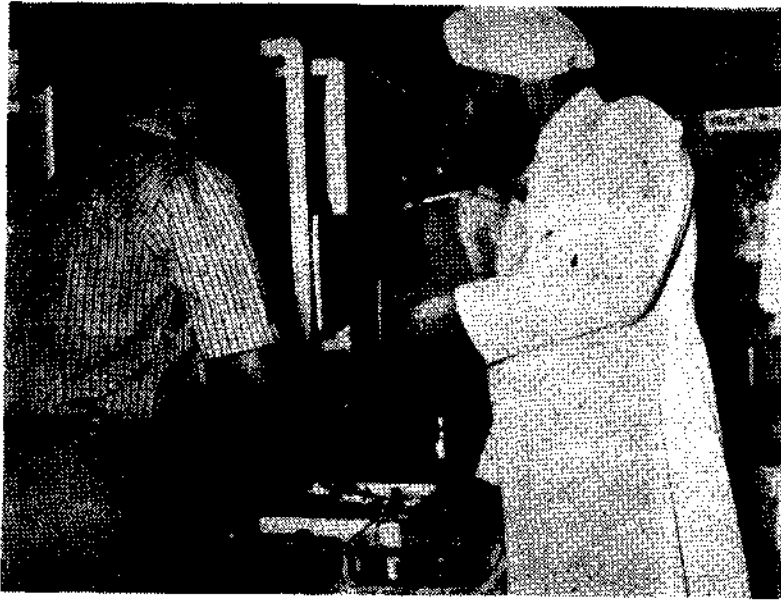
Number 16 & 17

April - September 1982

PRESIDENT VISITS FISHERIES INSTITUTES



During the visit of the President of India Shri Giani Zail Singh to Cochin an exhibition highlighting the research activities of CMFRI and CIFT was arranged at CIFT. The picture shows the President looking at the exhibits. (more pictures overleaf)



Pearl culture technique being explained to the President by Dr K. Alagaswami, Scientist S-3



The President receives pearl cultured at CMFRI from Dr E. G. Silas, Director, CMFRI

GROWTH INDUCED IN SPINY LOBSTER

Scientists of CMFRI have succeeded in inducing growth in spiny lobster.

It has been well established that the X-organ sinus gland complex in the eyestalk of crustaceans plays a major role in controlling moulting and weight gain in them. Ablation of eyestalk greatly accelerated moulting and weight gain in American lobster (*Homarus americanus*) which belongs to the group of clawed lobsters. But the experiments were unsuccessful in spiny lobsters *P. cygnus* and *P. arqus*, the native species of Australia and the U. S. respectively. Hence it was concluded that the

moulting-inhibiting factor may not be present in significant quantity in the eyestalk of Palinurid lobsters. However, encouraging results have been obtained by Shri E. V. Radhakrishnan and Shri M. Vijayakumar, Scientists of our Kovalam Field Laboratory, for the first time, in accelerating the moulting frequency and weight gain in Indian spiny lobster *P. homarus* by eyestalk ablation. Now it is possible to grow the lobsters from juvenile stage to marketable size (200g) in 140 days and double the growth in another sixty days. Normally lobster will take about 480 days to

reach 200g. The lobsters were fed clam meat *ad libitum*.

Spiny lobster is one of the most expensive sea food items of the epicurian gourmet and with the ever increasing demand, the lobster fishing grounds all over the world are being heavily exploited and this is also true to the Indian lobster fishery. Attempts for growing lobsters in captivity to augment the production have met with only partial success. The main constraints encountered in their culture are the long duration of their larval life and also slow growth rate.

PRAWN-TAGGING EXPERIMENTS THROW NEW LIGHT

Two tagged white prawns (*P. indicus*) released by CMFRI in Cochin harbour on 29 April and 22 May respectively were caught by fishermen at Ovari and Manapad (in Tirunelveli), 330 and 380 km from their place of release, 61 and 68 days later. During this period the first one had grown 42 mm and the second one 39 mm. The growth rates after tagging is comparable to those raised through culture. The implantation of tag seems to have no adverse effect on growth, moulting or migration.

A third prawn of the same species was recovered after a

lapse of 45 days by a country boat near Chinnamuttom in the south west coast, at about half way between Trivandrum and Kanyakumari, 250 km away from its point of release. Yet another white prawn was caught at Ovari, 94 days after its release at Cochin. More recoveries are expected in coming months.

CMFRI has been conducting mark recovery experiments for prawns and other important species of fish since 1975. All these experiments have indicated that the migratory movements of prawns in our back-water was restricted to within

20 km of the respective area of fishing although on a single instance a prawn tagged at Goa was recaptured 60 km north of its release point. In the present experiment under the leadership of Dr P. Vijayraghavan, Dr M. M. Thomas and Shri A. Noble, 8740 prawns belonging to the species *P. indicus*, *P. stylifera*, *P. semisulcatus*, *M. dobsoni*, *M. monoceros* and *M. affinis* were tagged and released in the shipping channel in the Cochin harbour during April-July. Many of the tagged prawns were later caught by fishermen from the

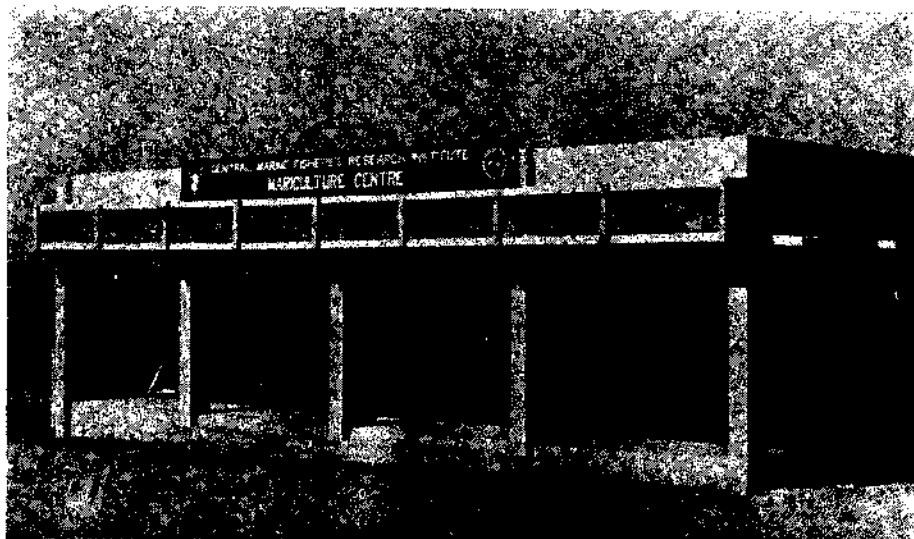
(continued on page 16)

NATIONAL CENTRE FOR MARICULTURE

CMFRI has established a National Centre for Mariculture at Muthukad, 36 km south of Madras. This would serve as an active centre of work in mariculture with composite facilities for technology testing and dissemination. The centre will take up culture of number of commercially important fishes and shellfishes and also set up a hatchery. Infrastructure will be available for research, training and transfer of technology. Shri P. R. S. Tampi, Scientist S-3 will be in charge of the Centre.

A stretch of 36.5 ha land has been acquired for this purpose from the Government of Tamil Nadu at an expenditure of Rs 5,40,001. An amount of Rs 0.4 million is proposed to be invested in this Centre. The first phase of the programme has already been initiated and a set of stocking and harvest has been successfully carried out for *P.monodon*. The field laboratory of CMFRI at Kovalam provides scientific support for culture operations. A transfer of technology programme for prawn under the Lab-to-Land is going on since 1979 at Muthukad and a mussel culture programme at Karikkattukuppam.

With the development of this National Centre and related activities, it is hoped that the local people also will be benefited by way of involvement in culture and construction operations.



Muthukad Field Laboratory building



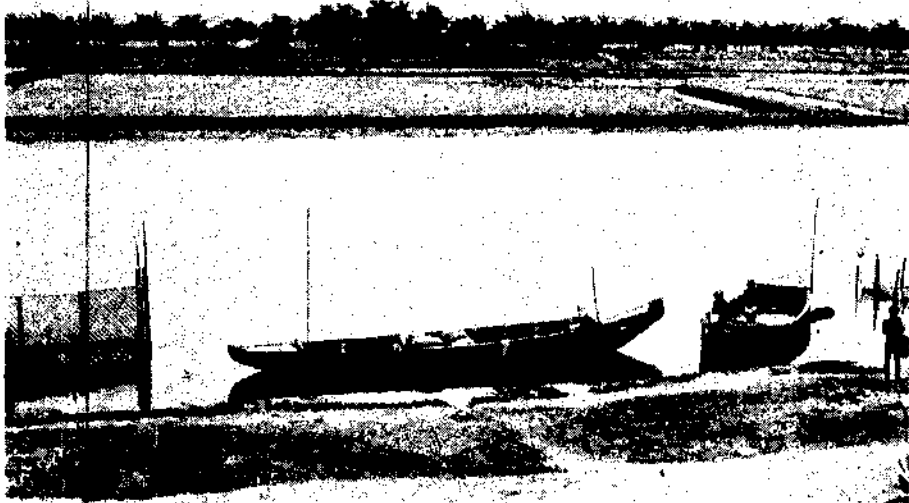
Deepening of ponds



Completed nursery ponds



Completed grow-out ponds



Formation of outline of ponds with sea in the background



Nylon-webbed hapa for rearing adult prawns

SUCCESS IN PRODUCTION OF OYSTER SPAT BY HATCHERY TECHNIQUE

The edible oyster *Crassostrea madrasensis* was induced to spawn successfully in the hatchery laboratory of the CMFRI at Tuticorin and spatfall was obtained in large number in August, 1982 for the first time in the country.

The oysters spawned under thermal stimulation. Sexually ripe oysters were exposed to low water temperature of 20-22°C for one or two days and water temperature was raised to 30-32°C at which the oysters spawned.

After fertilization and development, the larvae attained the straight hinge stage at the end of 20 hours, umbone stage on the seventh day and pediveliger stage on eighteenth day. The larvae were fed with the micro-alga *Isochrysis* produced under controlled conditions. On the nineteenth day after fertilization, the pediveliger which measured 310µ settled on spat collectors suspended in the tanks and metamorphosed to spat. The success in rearing

the oyster larvae to spat stage is a major achievement which will facilitate mass production of oyster seed through hatchery systems for oyster farming.

The work was carried out in a research project of CMFRI under the leadership of Shri K. Nagappan Nayar. S/Shri M. E. Rajapandian and C. P. Gopinathan were the Research Associates and Shri A. D. Gandhi gave technical assistance.

Record Collection of Milkfish Fry

Scientists of Regional Centre at Mandapam Camp succeeded in making a record collection of fry of milkfish *Chanos chanos*. This large collection of fry will be used for different experimental purposes and for rearing them in saline ponds and impoundments. The Regional Centre also supplied 20,000 fish fry to CMFRI's fish farm at Tuticorin. Mortality in transit was negligible. The culture of milk fish and pearl spot are important projects of CMFRI under fish and shellfish culture.

Forty Whale Sharks Landed

At trawler landing centre at Bhidiya at Veraval on 12 April nine specimens of whale shark (*Rhincodon typus* Smith) were observed by Shri G. Sudhakara Rao, Scientist at Veraval Research Centre. The sharks

were not caught accidentally but hunted for their liver oil which is used for painting boats and other wooden accessories used for fishing. The liver of this shark does not contain much vitamins. All the nine sharks were caught by a method similar to harpooning and brought ashore alive. The abdomen was cut open and the liver removed. The flesh was thrown back to the sea as it does not have any market value. The weight of the shark, on an average, was estimated at five tonnes. All sharks landed were more or less of the same size.

Again on 13 and 15 April thirteen whale sharks were landed making a total of 22. However enquires with the fishermen indicated the landings of 40 sharks in all. Fishermen informed that a number of sharks were sighted in the sea during the period.

Gopalan (1968) and Kunjipal (1976) reported the

occurrence of this species of shark along the Veraval coast. But in both these instances only solitary specimens were caught. The occurrence of the sharks along the coast is probably due to ingression of oceanic waters in to the inshore areas. Close vigil is being kept to record the landings in future and also to gather data on morphometrics of these specimens.

Biggest Size Mackerel Caught

The biggest size mackerel, ever reported, measuring 360 mm in length and weighing 560 gm was caught in a purse seine near Karwar. Occurrence of 3.5 tonnes of white sardines (*Kowala coval*) which has not been reported so far was also observed. Bumper catch of catfish, *Arius thalassinus* continued. Huge catches of *Megalaspis cordyla*, *Kowala coval* and 5000 numbers of black pomfrets were also landed.

Pollution Studies

CMFRI Scientists at Cochin have carried out on-the-spot studies on the deleterious effect of highly acidic water discharged from Eloor industrial area on estuarine fishes. Pollution was aggravated by the construction of a bund across the Periyar river to prevent incursion of saline water during summer months. The Kerala Water Pollution Board has been appraised of the situation and requested to take remedial measures. CMFRI has a project on the study of marine pollution in relation to protection of living resources.

Shark Flesh Finds Market In Cochin

Till recently the sharks landed at Digha in West Bengal were valued mainly for their fin which was exported to foreign markets and to certain extent for oil content of their liver. The liver oil was given to the State Fisheries Department in return for kerosene. The fins at Digha fetch a price of Rs 180 per kg for A grade (9" above), Rs 100 for B grade and (below 9" but above 5") and Rs 30 to Rs 40 for C grade (below 5").

The shark flesh which was hitherto thrown away in the beach and allowed to rot has now found a market in Kerala, reports Shri S. S. Dan, our Field Officer at Contai. During 1980-'81 and 1981-'82 fishing seasons, good quantities of processed shark and skate flesh were sent to Cochin

where they fetched a good price. At present, six local traders are engaged in the processing of shark meat.

The processing is done in a tent on the beach after the sharks and skates are procured from adjoining fish landing centres extending from Digha in Midnapur District to Talsari in Balsore. The animals are first beheaded, degutted and cut into large fillets and washed well in the sea water. The washed fillets are then spread over a mat in layers, one over another, with salt about one inch thick at the top, the bottom and also between the layers. After two days the fillets are taken out, washed again in sea water and kept in fresh salt, packed in bamboo baskets with polythene lining at the inner surface and wrapped in old gunny cloth and transported to Cochin by trucks. The price offered by Cochin traders at Digha is Rs 120-130 per 40 kg. During 1981-'82 fishing season about 18,000kg of cured meat was marketed. A truck normally

carried 150 baskets, each weighing 80kg. The traders made a good profit even after meeting a freight charge of Rs 9000/- from Digha to Cochin.

Science Camp

A two-day camp for students of vocational stream was organised by KVK on 24 and 25 May at Narakkal. The Camp was intended to create awareness among the students about the importance of fisheries. Twenty five students drawn from Little Flower High School, Narakkal participated in the camp. The camp was inaugurated by Shri Paul Thomas Mampilly, President Narakkal Panchayat. The programme included talk, demonstrations, field visits, audio-visual programmes and group discussions.

Six film shows on fisheries including the one about mariculture were screened at Kedamangalam and Narakkal. The films were projected by Shri P. Chacko, Projector Operator, of CMFRI

LAB TO LAND PROGRAMME

PRAWN HARVEST AT VALAPPU

a) Quantity	Ponds' AB'	Pond'C'	Pond'D'	canal	Total
kg					
Items	(0.84 ha)	(0.36 ha)	(0.4 ha)	(0.36 ha)	(1.96 ha)
<i>penaeus: indicus</i> }	160.50	77.80	54.70	36.70	329.70
Other: prawns }	64.75	—	18.00	74.20	156.95
Total:	225.25	77.80	72.70	110.90	486.65
b) Value (Rs)	3986.85	1575.45	1210.70	895.25	7668.25

FAREWELL TO



FIRST BATCH M Sc OF



Outgoing students with Dr Silas

JUNIOR FELLOWS



SILAS COMPLETES COURSE

All the nine Junior Research Fellows of the first batch of M Sc at the Centre of Advanced Studies in Mariculture, CMFRI completed the two-year course. A meeting was held on 16 September to bid farewell to the outgoing fellows. Dr E. G. Silas, Director of CMFRI who is the Sub-Project Coordinator of the CAS programme presiding over the meeting, briefly outlined the activities of CAS. Dr Silas observed that the postgraduate course offered by the Centre will go a long

way in meeting the expertise requirements for R & D programmes in mariculture. Dr T.V.R. Pillai, Leader of the FAO World Aquaculture programme delivered the valedictory address and gave away the course completion certificates to the students. Some of the outgoing students as well as CAS faculty members spoke. Dr P. Vedavyasa Rao, Scientist S-3 who has been assisting Dr Silas in the coordination of the project at the CMFRI proposed vote of thanks.

Above:

Receiving of Course- Completion Certificates

1. Shri P.K. Asokan
2. Shri R. Srinivasan
3. Shri T.I. Charles John Bhaskar
4. Shri K.P. Lakshmikantham
5. Shri P. Eswara Prasad
6. Shri K. Krishna Kumar
7. Shri K. Udaya Kumara
8. Shri P. Jayasankar
9. Kumari Pramila Rajan

Mobile Laboratory Commissioned

The Mobile Laboratory acquired by CMFRI has been commissioned. Dr Martha Vannucci, Director of UNESCO Programmes in India lit the sacred lamp and commissioned the Laboratory at a simple function arranged at Pelagic Fisheries Laboratory premises on 6 July. The Laboratory will carry out field-oriented investigations pertaining to water quality and farm management problems in aquaculture. These investigations will help the scientists to explore, on the spot, the economic feasibility of new culturable areas, water quality, management and farm engineering. Anthropogenic interference in the aquasystems can be monitored and remedial measures can be suggested to fish farmers.

The Mobile Laboratory has carried out on-the-spot studies at culture fields at Valappu and Neendakara in Kerala and Valinokkam in Tamil Nadu. The suitability of estuaries and backwaters at Pinnakayal, Vaipar, Vembar, Athankarai and Sethukarai in Tamil Nadu coast has been evaluated. Data on pollution in Vembanad Kayal due to discharges from FACT at Ambalamedu and Newsprint Project at Vellur are being gathered. Attempts have also been made to estimate the damages of flora and fauna of Tuticorin waters due to effluents from Thermal Project, SPIC and DCM. Causal factors for the occurrence of cotton shrimp at Tirunelveli is also being investigated.

Bulletin on Tuna Resources

The World Scientific Meeting on Biology of Tunas and related species held in 1962 at California indicated the possibilities of the development of tuna fisheries in the Indian Ocean. Not much information was available unfortunately, on Indian tunas and tuna-like fishes. The Bulletin Number 32 by Dr E.G. Silas and Dr P. P. Pillai published by CMFRI brings together the information known about Indian Ocean tunas, their ecology and fisheries including present levels of exploitation. Dr Silas was one of the participants in the International Indian Ocean Expedition in 1964 on board Anton Bruune which gave him the opportunity to watch the problems of tuna resources closely.

Dr Vannucci lighting the sacred lamp



VISITORS

Hon'ble Union Minister of State for Agriculture and Rural Development Shri R. V. Swaminathan accompanied by Chief Engineer, Fisheries Harbour Projects, Kerala with his senior officials and the Director of Fisheries, Kerala visited Vizhinjam Research Centre of CMFRI on 13 May. After seeing the various research activities Hon'ble Minister visited the mussel and oyster culture sites.

Mr Makato Yamasaki, Fisheries and Marketing Specialist, Fisheries and Aquaculture International Co. Ltd., Tokyo visited Vizhinjam Research Centre.

Dr Jean yvzs Le gall, French Expert in tuna fisheries visited CMFRI and gave a talk on French experience in tuna fisheries.

Dr Leonard J.V. Campagno, Tiburon Centre for Environmental studies, San Fransisco State University, Tiburon, California, a world specialist in elasmobranchs visited CMFRI and gave two lectures on sharks, their biology and utility and 'megamouth', a new finding.

The Following persons also visited CMFRI during the period.

Shri K. P. Padmanabhan, Deputy Director of Fisheries, Pondicherry.



Hon'ble Minister Swaminathan with the scientists at Vizhinjam

Shri M. D. Sahidulla, Deputy Director, Marine Fisheries, Chittagong, Bangladesh.

Dr. J. G. Rumea, FAO Representative in India and Dr A.C. Mandiratta, Personnel Officer UNDP.

Professor M. M. Taqui Khan, Director, Central Salt and Marine Chemicals Research Institute, Bhavnagar.

Shri R. Vijayakumar, IAS, Subcollector, Tuticorin.

Shri S. Srinivasan, IAS, Secretary, Ministry of Forests and Fisheries, Tamil Nadu.

Shri Sankarasubbiah, IAS, Director of Fisheries, Tamil Nadu.

Dr. O.P. Makhija, Scientist. Post graduate Agricultural Education and Research, ICAR, New Delhi and Shri V. Kumar, Administrative Officer, UNDP Cell.

R. V. SKIPJACK

CMFRI'S Research Vessel R.V. Skipjack is expected to be taken over on 1 December. Dr R.M. Acharya, Deputy Director-General (Animal Sciences) ICAR will be taking delivery of the Vessel on behalf of CMFRI.

MEETINGS

Official Language Committee

The Second Sub-Committee of the Parliament Official Language Committee met at Veraval Research Centre of CMFRI on 28 August. S/Shri Nathuram R. Mirdha, Ramavathar, G. H. Bhaghat and N. Makwana, four of the Committee Members were present at the meeting. Action taken in implementing official language at CMFRI and CIFT were discussed. The Committee appreciated the progress made by these Institutes and suggested that more publications in Hindi should be brought out. The Committee also assured necessary action to get the post of Hindi translators and typists sanctioned. Shri C. C. P. Rao, Director, CIFT, Dr S. V. Bapat, Joint Director, Dr S. Ramamurthy, Shri G. Sudhakara Rao and Dr H. Moahamad Kasim, Scientists from CMFRI attended the meeting.

Officials of CMFRI attended the following meetings

Dr E. G. Silas, Director attended the following meetings.

The Coordination Meeting of ICAR Fisheries Institutes called by Deputy Director-General, ICAR at New Delhi, 12-14 April.

International Convention on Deep Sea Fishing organised by the Association of Indian Fisheries Industries at New Delhi, 23-25 June.



Members of the Parliament Sub-Committee with Shri C.C.P. Rao, Director, CIFT, Shri S. V. Bapat, Joint Director, and the Scientists of CMFRI

Shri K. Nagappan Nayar, Scientist S-3 attended the Second All India Workshop on Lab-to-land Programme at Jabalpur.

Shri G. Sudhakara Rao, Scientist S-1 has been nominated to represent CMFRI as Member, Consultative group for the Porbandar base of EFP.

Conservation of seaturtles—a feature by Shri M. Rajagopalan was telecast by Door Darshan, Madras in its Science Spectrum Series.

A talk on Brackishwater farming by Shri P. Karunakaran Nair, Senior Training Assistant, KVK was broadcast over All India Radio, Trichur in its Farm and Home Programme.

An interview with the 69th batch of KVK trainees has been recorded for broadcasting by AIR, Trichur.

A talk by Shri Madan Mohan,

Scientist S-1 on the research work done at Minicoy Research Centre of CMFRI was broadcast over All India Radio, Calicut in its Lakshadweep Programme.

A staff seminar on the action to be taken on the recommendations of High-Level Evaluation Committee of Kirshivigyan Kendras was held at KVK, Narakkal, 8 July.

Under the Social Forestry of Prime Minister's 20 Point Programme saplings of different varieties of wild trees supplied by the local Block Development Office was planted in the KVK and NPCL campuses and in the adjacent colonies and also on either sides of the road leading to KVK.

The third phase of the short-term course in mussel culture training programme at Karwar concluded on 14 May.

STAFF NEWS

Deputations

Dr K. Alagarwami, Scientist S-3 proceeded for three months training in Reproductive physiology of fishes and shellfishes at University of California and Institute National de la Recherche Agronomique (INRA), France.

Shri D.C.V. Easterson, Scientist S-2 underwent training in Bioenergetics at Bidegia Marine Laboratory, U. S. A.

Shri D. Kandaswamy, Scientist S-1 was deputed to undergo training in Nutrition at the Kagoshima University, Japan.

Dr M. K. George, Scientist S-1 has been deputed for training in Endocrinology at Fisheries Department, Scotland, U. K.

Shri P. Radhakrishnan, Training Assistant, KVK participated in six days training programme on Operation and maintenance of audio-visual aids and preparation of audio-visual aids at Trainers' Training Centre, Central Institute of Agricultural Engineering, Bhopal.

Shri N. Neelakanta Pillai and Dr A. Geethanand Ponniah, Scientists S-1 attended the Summer Institute on Advances in cytogenetics and their application in livestock improvement and production at National Dairy Research Institute, Karnal.



Shri S. Mahadevan, Scientist S-2 and Officer-In-Charge, Mandapam Regional Centre confers with Burreson at Virginia Institute of Marine Science. (Photo appeared in Daily Press of Gloucester Point, Virginia along with a write up on Shri Mahadevan's visit to VIMS)

Smt. V. Chandrika, Scientist S-1 participated in the summer institute on Organic matter recycling for fuel, feed and fertilizer at Department of Microbiology, Haryana Agricultural University, Hissar.

Dr P. Vedavyasa Rao, Scientist S-3 and Shri M.S. Muthu Scientist S-2 were appointed Guest Lecturers for M.Sc. Marine Biology IV Semester at the University of Cochin.

Sagitta, 32 feet boat was taken delivery by CMFRI at Mandapam Camp.

Two windmills have been erected, one at Karapad Field Laboratory and other at the farm site attached to Tuticorin Research Centre of CMFRI.

Award of Degree



Sri P. M. Aboobaker, Technical Assistant T-II-3 passed M. Sc. Marine Biology of the Karnataka University with first rank and distinction.

Appointments

Shri P. R. S. Thampi, Scientist S-3 on transfer from ICAR Headquarters, 6 May.

Dr M. M. Thomas, Scientist S-2 as Scientist S-3 (Agricultural Extension) at KVK, 29 September.

Shri K. K. Datta as Scientist S-1 (Agricultural Economics) at Cochin, 19 June.

Shri S. G. Raje, as Scientist S-1 (Fish and Fishery Science) at Veraval, 11 June.

Shri M. Sivadas as Scientist S-1 (Fish and Fishery Science) at Madras, 24 June.

Shri A. P. Lipton, Scientist S-1 at Veraval on transfer from ICAR Research Complex for NEH Region, Shillong, 26 July.

The following Scientists have been promoted through five yearly assessment with effect from 1 July, 1979.

S-1 to S-2

Dr T. Appa Rao

Dr R. S. Lal Mohan

S to S-1

Shri D. Sivalingam

Shri M. M. Meiyappan

Shri P. Natarajan

Shri Mohamed Zafar Khan

Shri T. S. Velayuthan

Shri K. N. Rasachandra Kartha, Training Assistant (T-4) as Senior Training Assistant(T-6) at KVK, 21 September.

Shri U. K. Sathyavan, Senior Technical Assistant (T-4) as Field Officer (T-6) at Cochin, 21 September.

Shri A. Bastin Fernando, Senior Technical Assistant (T-4) as Curator (T-5) at Mandapam Camp, 28 July.

Shri K. Purushothaman Kani as Training Assistant (T-4) at KVK, 30 July.

Shri B Narayana Rao, Technical Assistant (T-I-3) as Technical Assistant (T-II-3) at Waltair, 13 September.

Shri T. S. Balasubramanian, Junior Technical Assistant (T-2) as Technical Assistant (T-II-3) at Goa, 15 September.

Shri Y. Muniappa, as Field Assistant (T-1) at Mangalore, 1 April.

Shri Kamble as Field Assistant (T-1) at Bombay, 5 April.

Shri James George as Driver (Boat) (T-1) at Waltair, 22 April.

Shri M. Prasad Rao as Field Assistant (T-1) at Waltair, 27 April.

Shri K. Subramanian as Field Assistant (T-1) at Karwar, 7 June.

Shri Devidas Y. Naik as Field Assistant (T-1) at Karwar, 28 July.

Shri Sarang J. D. as Field Assistant (T-1) at Bombay, 24 August.

Shri K. Anandan as Punch Card Operator (T-1) at Cochin, 30 August.

Shri R. Dorairaj, Assistant Administrative Officer on *ad hoc* as Assistant Administrative Officer on regular basis at Mandapam Camp, 30 July.

Shri R. S. Guruvel, Assistant as Superintendent (Audit and Accounts) at Cochin, 8 July.

Shri K. M. Karuppiyah, Assistant on *ad hoc* as Assistant on regular basis at Cochin, 8 July.

Shri S. B. Tambe, Senior Clerk as Assistant at Bombay, 16 September.

Shri G. Pednekar, Assistant as Superintendent at Tuticorin, 9 June.

Smt T. K. Ponnamma, Senior Clerk as Assistant at Cochin, 20 April.

Shri K.P. Chandrasenan, Senior Clerk on *ad hoc* basis as Senior Clerk on regular basis at Cochin, 20 April.

Kumari Tharamathi as Junior Clerk at Cochin, 30 June.

Kumari N.K. Suseela as Junior Clerk at Cochin, 1 July.

Kumari R. Radha as Junior Clerk at Cochin, 2 July.

Kumari G. Ambika as Junior Clerk at Cochin, 2 July.

Shri V. Chandrasekharan as Junior Clerk at Cochin, 8 July.

Shri K. Baburajan as Junior Clerk at Cochin, 8 July.

Smt P. V. Shanbhag, Senior Clerk on *ad hoc* as Senior Clerk on regular basis at Bombay, 16 September.

Shri P. Gadankush as Motor Driver at Bombay, 15 September.

Shri V. C. Gopalan as Cook (Boat) at Cochin, 21 September.

Shri C. Unnikrishnan, as S. S. Grade I (Oil Man) at Cochin, 22 May.

Shri E. F. Francis, S.S. Grade I (Watchman) as S. S. Grade II (Watchman) at Cochin, 14 May.

Shri Rajan, S.S. Grade I (Peon) as S. S. Grade II (Peon) at Cochin, 14 May.

Smt S. Daisy, S. S. Grade I (Safaiwala) as S. S. Grade I (Safaiwala) at Tuticorin, 14 May.

Shri Ganesan, S. S. Grade I (Watchman) as S. S. Grade II (Watchman) at Cochin, 14 May.

Shri K. E. Joseph Victor, S. S. Grade I (Watchman) as S. S. Grade II (Watchman) at Calicut, 14 May.

Shri V. Viswanathan, S. S. Grade I (Watchman) as S. S. Grade II (Watchman) at Vizhinjam, 14 May.

Shri C. Chandran as S.S. Grade I (Watchman) at Cochin.

Shri K. Vellayan, S. S. Grade I (Watchman) as S. S. Grade II (Watchman) at Mandapam Camp, 24 June.

Shri L. Sathan, S. S. Grade I (Safaiwala) as S. S. Grade II (Safaiwala) at Mandapam Camp, 24 June

Smt. S. Nagammal, S. S. Grade I (Safaiwala) as S. S. Grade II (Safawala) at Mandapam Camp.

Shri T. Nagalingam as S. S. Grade I (Watchman) at Kovalam, 26 July.

Shri S. Rajan as S. S. Grade I (Messenger) at Madras, 4 August.

Shri A. Vairamani as S. S. Grade I (Fieldman) at Mandapam Camp, 18 August.

Shri K. Thangavelu as S. S. Grade I (Fieldman) at Mandapam Camp, 18 August.

Shri G.K. Rajan, as S.S. Grade I (Pump Driver) at Mandapam Camp, 18 August.

Shri J. Hameed Sultan as S.S. Grade I (Pump Driver) at Mandapam Camp, 18 August.

Shri W. Sathyavan Neelraj as S. S. Grade I (Fieldman) at Tuticorin, 6 September.

Shri K. Muthuvel as S. S. Grade I (Fieldman) at Tuticorin, 8 September.

Transfers

Shri G. Subramanya Bhat, Junior Technical Assistant (T-2) from Bombay to Mangalore

Smt. K. M. Fatima Beevi, Stenographer at Cochin to CTCRI, Trivandrum on inter-institutional transfer.

Shri M. Samuel Sumithrudu, Field Assistant (T-1) from Bombay to Waltair.

Shri Y. Muniyappa, Field Assistant (T-1) from Mangalore to Bombay.

Shri K. Narayana Rao, Field Assistant (T-1) from Kakinada to Waltair.

Shri S. K. Murali, Senior Clerk from Cochin to Madras.

Shri Antony George Ratnam, Senior Clerk from Cochin to Tuticorin.

Shri J. M. Vaz, Senior Clerk from Tuticorin to Cochin.

Shri K. Rama Kurup, Motor Driver from Cochin to Calicut.

Shri M. Xavier Mohandas, Motor Driver from Cochin to Tuticorin.

Shri K. Ambalagan, Driver (Boat) (T-1) from Cochin to Mandapam Camp.

Shri E. Sivanandan, Cook (Boat) from Mandapam Camp to Vizhinjam.

Shri D. Bosco Fernando, Deckhand from Tuticorin to Cochin.

Shri K. C. Devassy, Deckhand from Cochin to Tuticorin.

Relief

Shri V. Josanto, Scientist S-1 on reversion to National Institute of Oceanography, 30 April.

Shri S. J. Rajan, Field Officer (T-7) on superannuation, 31 August.

Shri Jaganathan, S.S. Grade III (Laboratory Attendent) superannuation, 30 April.

Shri. P. Ettymurugesan, S. S. Grade III (Laboratory Attendent) on superannuation, 31 May.

Shri T. Mohamed Iqbal, Field Assistant (T-1) at Calicut on termination, 5 July.

Shri A. Kondan Chattiar, Motor Driver on superannuation, 31 July.

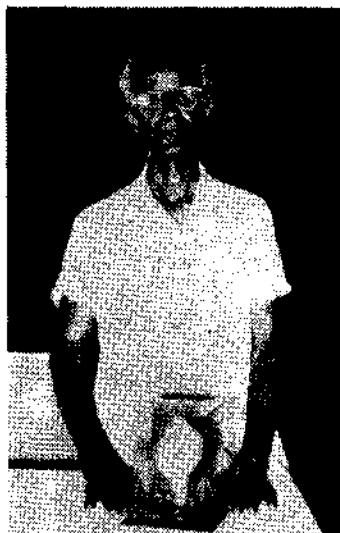
Shri P. C. Appukkuttan, Motor Driver on superannuation, 31 August.

Shri K. G. Damodaran, S. S. Grade III (Laboratory Attendant) on superannuation, 31 July.

Shri U. S. Ramakrishnan, S. S. Grade III (Binder) on superannuation, 31 August.

Smt. S. Lalitha, Junior Stenographer on appointment elsewhere, 28 August.

Kumari P. I. Rosy, Junior Clerk on resignation, 17 September.



Shri Damodran

Shri H. S. Mahadeva Swamy, Field Assistant. at (T-1) Mangalore married Kumari B. M. Mangala, 20 May.

Shri G. Subramanya Bhat Junior Technical Assistant (T-2) at Bombay married Kumari Sharada at Thaire, 20 May.

Shri R. G. Naik, Junior Clerk at Karwar married Kumari Sarita, 19 May.

Shri B. G. Kalmate, SS G. I. (Messenger) at Bombay, married Kumari Sushila 2 June.

Weddings

Shri N. Palaniswami Technical Assistant at Fisheries Harbour married Kumari Selvi at Udumalpet, 7 April.

Obituary

Shri R. G. Nadig, S. S. Grade III (Laboratory Attendant) expired on 8 June.

Shri S. Russel Conrad Samuel, Junior Technical Assistant (T-2) expired on 3 July.

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backwater areas. It is evident from the present recoveries that the prevailing southwesterly drift along the west coast to the Gulf of Mannar in the east coast may be responsible for the migration in such a

short time. That the stock of prawns occurring at Cochin could be distributed over such an extensive belt along our coast would undoubtedly alter the existing concepts in the migratory propensities of the species. This finding will have far-reaching implications both to the fishing industry as

well as to the scientists involved in the management problems of shrimp fisheries. Based on the above results preparations are under way for releasing nearly 30,000 prawns of migrating size during the next migratory period, off Cochin to confirm the present findings more substantially.

