

Special Article

**SUMMARIZED REPORT ON THE PROCEEDINGS OF THE 4TH CONGRESS OF THE
PAN INDIAN OCEAN SCIENCE ASSOCIATION AND THE RECOMMENDATIONS
OF ITS COUNCIL**

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1. Historical Background of P.I.O.S.A.

The Pan Indian Ocean Science Association came into existence in January, 1951, and its first Congress was held the same year in India. The Second Congress was held in Australia in 1954 and the third in Madagascar in 1957. With the approval of the Government of Pakistan, the Association was invited to hold its Fourth Congress at Karachi in November, 1960. The member countries of the Association are Australia, Antarctica (France), Burma, Ceylon, France, India, Madagascar, Malaya, Mauritius, the Netherlands, Pakistan, Portugal, Singapore, Indonesia and Thailand.

The objects of the Association are:—

(i) to discuss scientific problems specially relating to the well-being of the people and the progress of the countries encircling the Indian Ocean and make recommendations to the countries concerned as and when necessary, and

(ii) to promote feelings of brotherhood among the scientists of the countries around the Indian Ocean and thus help build up closer and stronger ties of friendship among these countries.

The following broad divisions of science were included under the organization of the P. I. O.S.A.:—Section A- Physical Science; Section B- Biological Science; Section C- Geological Science; Section D- Agricultural Science; Section E - Economics, Education and Social Science; Section F - Geography, Oceanography and Geophysics; Section G - Human Ecology. In accordance with an earlier decision of the P. I. O. S. A. Congress, seven National Committees, one for each of the above sections, were set up.

2. Inauguration

The inaugural address was delivered by Mr. A. K. Khan, Minister for Industries, Government of Pakistan. This was followed by the installation of the new General President of the Congress,

Dr. Salimuzzaman Siddiqui, by the retiring General President, Prof. J. Millot of Madagascar.

Making a reference in his inaugural address to the achievements of science, which is now reaching out to the exploration of space, the Minister for Industries emphasized that the well-being of our people still depends primarily on "our labours on this familiar old earth to win from it food for their sustenance and mineral products for their material advancement." Mr. Abul Kasem Khan also pointed out that the economically developed countries should share with Pakistan and her neighbours their greater knowledge and technical experience, in order to promote the various sectors of their national development. He said that since the advent of the new regime, everything possible was being done in Pakistan to redress the defects of the previous situation and to harness all available means for stepping up agricultural production and industrial development with a view to ensuring a balanced and well integrated economy.

In his presidential address, Dr. Salimuzzaman Siddiqui, who headed Pakistan's 10-man delegation, said that while international bodies were striving to strengthen the economies of the developing countries, regional associations such as the P.I.O.S.A. could promote a balanced progress in the various sectors of their national life due to their keener appreciation of their mutual problems. The Secretary of the P.I.O.S.A., Dr. Qudrat-i- Khuda, dealt with the problems Pakistan had been facing since her birth in 1947. He also referred to the two cyclones in East Pakistan, and added that these cyclones were a challenge to science. He held the view that scientists must do something of a permanent nature to overcome such natural calamities. The retiring President, Prof. J. Millot, thanked the Government of Pakistan for their hospitality and the Minister for Industries, Mr. A. K. Khan, for inaugurating the conference.

3. Delegates to the 4th Congress

The following delegates and observers from member countries and international scientific

societies attended the 4th Congress held in Karachi from 16th to 24th November, 1960.

I. OFFICIAL DELEGATES FROM MEMBER COUNTRIES

Australia

1. Professor A. D. Ross, Leader of the delegation and founder of P.I.O.S.A., President, Australian Academy of Science.

2. Professor L. J. H. Teakle, Deputy Leader of Australian delegation, Professor of Agriculture, University of Queensland.

3. Dr. E. P. Hodgkin, Reader in Entomology and Comparative Anatomy, University of Western Australia.

4. Mr. J. J. Basinski, Research Officer, Division of Land Research and Regional Survey, Commonwealth Scientific and Industrial Research Organisation.

Ceylon

5. Dr. N. G. Baptist, Leader of the delegation, Department of Biochemistry, Faculty of Medicine, Colombo.

France

6. Professor J. Millot, Director, Institute for Scientific Research for Madagascar.

French Antarctica

7. Mademoiselle Genevieve Pillet, Bureau Scientifique des Tarres Australes et Antarctiques Francaises.

India

8. Professor M. S. Thacker, Leader of the delegation, Secretary to the Government of India, Ministry of Scientific Research and Cultural Affairs, and Director-General of C.S.I.R., New Delhi.

9. Dr. K. S. Krishnan, Director, National Physical Laboratory, New Delhi.

10. Dr. K. Chandrasekharan, Professor of Mathematics, Tata Institute of Fundamental Research, Bombay.

11. Dr. T. S. Sadasivan, Director, University Botany Laboratory, Madras.

12. Dr. L. N. Johri, Reader, Department of Zoology, Delhi University.

Indonesia

13. Professor Dr. Ir. Tojib Hadiwidjaja, Leader of the delegation, Dean, Faculty of Agriculture, University of Indonesia, Bogor, Indonesia.

14. Dr. R. P. Oetoyo, Director, Central Veterinary Institute, Bogor.

15. Mr. Hasanuddin Saanin, Head of the Institute of Inland Fishery, Bogor.

16. Dr. Dradjat, Deputy Head of Institute of Nutrition, Department of Health, Djakarta.

Madagascar

17. Dr. R. Paulian, Leader of the delegation, Deputy Director, Institute for Scientific Research for Madagascar.

Malaya (Kuala Lumpur)

18. Professor J. R. Hendrickson, Professor of Zoology, University of Malaya, Kuala Lumpur.

The Netherlands

19. Dr. G. H. Vander Kolff, Leader of the delegation, Professor of Eastern Economics, University of Amsterdam.

20. Dr. J. Van Duijnen Montijn, Director of Oceanography and Maritime Meteorology Department, Royal Netherlands Meteorological Institute, D. Bilt.

21. Dr. J. De Wild, Professor of Agricultural Zoology (Entomology), Agricultural Institute, Wageningen.

22. Dr. H. Vlugter, Irrigation Expert to F. A. O., Punjab Club, the Mall, Lahore.

23. Dr. J. G. Vermaat, Pedologist to the F. A. O., c/o UNTAB, Sind Club, Karachi.

Pakistan

24. Dr. Salimuzzaman Siddiqui, Leader of the delegation, Director, Pakistan Council of Scientific and Industrial Research, Karachi.

25. Dr. M. Qudrat-i-Khuda, Director, East Regional Laboratories, Pakistan Council of Scientific and Industrial Research, Tejgaon, Dacca.

26. Dr. Nazir Ahmad, Textile Adviser to the Government of Pakistan, Karachi.

27. Dr. N. A. Qazilbash, Professor of Botany, University of Peshawar, Peshawar.

28. Mr. J. M. Master, Director, Geological Survey of Pakistan, Quetta.

29. Dr. S. D. Chowdhury, Director of Agriculture, Government of East Pakistan, Dacca.

30. Dr. Mahmood Hussain, Dean Faculty of Arts, Karachi University, Karachi.

31. Mr. S. N. Naqvi, Director, Meteorological Services, Karachi.

32. Col. M. K. Afridi, Vice-Chancellor, Peshawar University, Peshawar.

33. Dr. M. Raziuddin Siddiqui, Vice-Chancellor, Sind University, Hyderabad.

Portugal

34. Prof. J. Pinto Lopes, Director of Institute of Scientific Investigations.

Thailand

35. Vice-Admiral Charoon V. Bunnag, Leader of the delegation, Director of Meteorological Department, Bangkok.

36. Captain Amporn Penyapol, Royal Thai Navy, Chief of Oceanography Division, Hydrographic Department, Bangkok, Thailand.

II. OBSERVER DELEGATES

Indian Ocean International Historical Association

37. M. Andre Scherer, Director des Services, Secrétaire General de l' Association Historique International de Indian Ocean. (He also represented the Reunion Island).

Naga Expedition

38. Mr. E. C. La Fond, Ministry of Food and Agriculture, Bangkok, Thailand.

New Zealand

39. Professor A. D. Ross, Leader of Australian delegation to act as an observer of the Government of New Zealand.

Royal Society of Edinburgh's (U. K.)

40. Professor Emeritus, Balnagown, Golf Links Road, Albany, Western Australia.

Science Council of Africa South of Sahara

41. Professor J. Millot, to act as Official Observer.

Turkey

42. Mr. Omer M. Baykan, Assistant Professor of the Chair of Soil Studies, Faculty of Agriculture, Ataturk University, Turkey.

43. Mr. Ferit Ucarci, Assistant Professor of Geo-technic, Faculty of Agriculture, Ataturk University, Turkey.

World Meteorological Organisation

44. Mr. Muhammed Samiullah, Deputy Director, Pakistan Meteorological Services.

45. Mr. Muhammed Khalil Khan, Deputy Director, Pakistan Meteorological Services.

U. S. A.

46. Mr. David C. Rife, U. S. A.

47. Mr. Robert G. Snider, Co-ordinator, International Indian Ocean Expedition.

F. A. O.

48. Mr. Ijaz Ahmad, F. A. O. Country Representative, Karachi.

Besides the above, about 100 delegates from the universities and other scientific institutions in the country attended the Congress. Invitations were extended to well known industrialists, scientists and members of diplomatic corps, specially those representing the member countries of the P. I. O. S. A., to attend the inaugural session on the 16th November 1960.

A Reception Committee consisting of eminent scientists and industrialists was formed under the Chairmanship of Mr. B. A. Hashmi, Vice-Chancellor, Karachi University, and a number of sub-committees were also constituted to ensure effective co-ordination in the management of the affairs of the Congress.

4. Sectional Meetings

Almost all the countries surrounding the Indian Ocean are now running on a deficit with regard to the production of major food crops, and are also economically undeveloped because of lack of technical data necessary for the adequate utilization of their natural resources. It was accordingly agreed by all the scientists within the country and also by the members of most participating countries that the main focus of discussions in the Congress should be on food and the utilization of indigenous resources for national development. The first day was devoted to the reading of presidential addresses in the various sections, which served to provide the keynote for the discussions and for the papers that were read during the whole period of the Congress.

A. PHYSICAL SCIENCE

(i) *Physics*.—In the meeting of the Physical Science Section presided over by Prof. K. S. Krishnan of India, Dr. M. M. Qurashi of the Central Laboratories, P. C. S. I. R., in the course of discussions on the rapid estimation of the oil content of a single cottonseed, showed how the water content of the seed would influence the electrical properties of cottonseed and the cake. Dr. Qurashi also described the results of measurements on the intermolecular energy of activation in some hydroxylic liquids.

While discussing the effect of surface smoothness of some crystals on the thermal conductivity measurements, Dr. Tirmizi of Karachi University showed that these measurements were sensitive to the nature of surface of the crystals. Dr. Mujtaba Karim of Karachi University presented two interesting papers on the determination of atmospheric radio-activity and its correlation with weather conditions, nuclear explosions and other phenomena, for example the solar eclipse.

The Chairman, Dr. K. S. Krishnan, gave a brief review of some recent researches on the fundamental side being carried out in his laboratories, with special reference to an elegant new method for determining the absolute value of the thermionic emission co-efficient for various substances.

Mr. S. N. Naqvi of the Meteorological Department, presented a series of papers, one of which dealt with periodicity in the cyclonic storms and depressions which cause floods in the Indus basin.

(ii) *Chemistry*.—The majority of the chemical papers were of an applied character, dealing with

the better utilization of indigenous raw materials and industrial waste products. Particular mention must be made of papers on (1) preparation and application of betulin-based modified rosin esters by Mr. M. Aslam; (2) Copper fungicide based on rosin by Mr. M. Aslam; (3) Synthetic tanning material from black (lignin) liquor by Dr. E. Dubash; (4) Examination of indigenous bentonites for refining cottonseed oils by Dr. M. K. Bhatt; (5) Survey of indigenous aromatic plants by Mr. Shafiq.

B. BIOLOGICAL SCIENCE

In the Biological Section's meetings, which were presided over by Dr. Millot of Madagascar, sea fish and inland fish resources in Pakistan and their development were exhaustively discussed. Dr. Millot presented a number of papers on zoological and botanical work carried out in the Herquelien Island in the south of Indian Ocean. Mr. S. Saanin, an Indonesian delegate, read papers describing results obtained regarding the effects of fertilization on the luminology of paddy fields and of the toxicity of insecticides on the cultivation of fish in Indonesia.

C. & F. COMBINED. GEOLOGY, GEOGRAPHY, OCEANOGRAPHY AND GEOPHYSICS

Climate.—In the combined sectional meetings of geology, geography, geophysics and oceanography, presided over by Vice-Admiral C. V. Bunnag of Thailand, Dr. Mentia described the need of international cooperation for compilation and publication of information on climatology and the climatological Atlas of the Indian Ocean. Prof. M. I. Chowdhry of Pakistan described his findings based on extensive studies of morphological changes in the Bengal Basin. Dr. David D. Smith described the work on the geomorphic studies of the Makran coast and Lasbella area in West Pakistan. He also mentioned investigations on beach rocks which may be described as cemented beach sand of very recent origin.

Mr. M. M. Rizki of the the Meteorological Department read a paper on the chlorinity and salinity of the Arabian Sea and Bay of Bengal, based on analysis of the samples collected by P. N. S. Zulfikar. Mr. A. H. Qureshi of the Survey of Pakistan gave a history of survey and cartography in Pakistan and of the important programmes the Survey of Pakistan is engaged in.

D. AGRICULTURAL SCIENCE

Under the presidentship of Prof. L. J. H. Teakle and Dr. S. D. Chowdhury, the Agricul-

tural Section discussed papers on food and food Products. Dr. C. M. Ishaq of the North Regional Laboratories, P. C. S. I. R. described the fruit resources of Pakistan and emphasised the enormous possibilities of building up the economy through proper processing of the fruits. Dr. Bhatti in a paper on commercial vinegar manufacture demonstrated that with the raw materials available in the country there exist good possibilities of developing this industry on an economic basis.

Dr. H. N. De of the East Regional Laboratories, P.C.S.I.R., discussed the starch resources of East Pakistan, their potential amylose and amylopectin contents and other properties which would suggest the suitability of these starches for industrial and edible uses. In presenting the papers on the biogenesis of starch and vitamin C in two varieties of potato, Dr. De also showed that, although the white skin variety possessed more starch, it contained less vitamin C than the red skinned one. In the discussion on the effect of utensils used for the cooking of vegetables, it was pointed out that all types of utensils, earthen, aluminum and iron, cause a loss of about 65 per cent of vitamin C.

Dr. D. K. Das presented a paper on the mangrove plants of East Pakistan and emphasised the importance of vegetation in conservation of the coastal area by preventing erosion, and the use of such plants as raw material for newsprint manufacture and also for fuel.

In dealing with the longer storage life of parboiled rice it was shown by Dr. De of the East Regional Laboratories that this is mainly due to inhibition of any loose activity in the parboiled rice for which less reducing sugar is formed leading to a retarded growth of the microorganisms. It was further shown that parboiled rice requires smaller quantities of water for cooking and also the gruel water left from it was lower in starch content as compared to the cooking of raw rice.

In discussing the nutritive value of sundried 'Sukti' fish, it has been reported that the application of different spoilage tests, as developed in the East Regional Laboratories, shows no evidence of spoilage in this traditionally processed foodstuff of East Pakistan.

A report about the high protein formulated diets prepared for improving the nutrition of school-going children was submitted by Dr. De. He mentioned that fish flour, egg powder and the vermicelli prepared by blending these protein sources with the sweet potato starch by a new technique can withstand severe climatic conditions without showing spoilage.

E. ECONOMICS, EDUCATION AND SOCIAL SCIENCE

In the section of economics, education and social sciences, which met under the presidency of Dr. G. H. Vender Kloff of Amsterdam, two significant papers relating to (1) fear arousing communication, and (2) juvenile delinquency, were read and discussed.

G. HUMAN ECOLOGY

(i) *Nutrition*.—Papers read at meetings of the Human Ecology Section were mainly devoted to the nutritional problems in the countries surrounding the Indian Ocean. Dr. N. G. Baptist of Ceylon, who presided over the meeting of this section, discussed the protein and amino acid requirements of the people of this region. Dr. Dradjat of Indonesia showed how the nutritive value of food may be improved by fermentation processing.

Dr. A. K. M. Wahed in his paper gave an account of the problems of old age in their social contact and suggested that home for the care of old and the aged should be instituted.

Problems of man's existence in space were mentioned by Dr. Musa Khan and he described how air could be fairly well supplied by algal cultivation in the space ship.

Dr. Ilyas brought to the notice of the members the alarming situation about the malnutrition of school children as revealed in the surveys.

(ii) *Irrigation Problems*.—In the joint session of agriculture and human ecology, held under the presidency of Prof. L. J. H. Teakle, Dr. Vlugter discussed the irrigation problems for agriculture in West Pakistan, and pointed out the need for utilising the available water in smaller areas but with fuller benefit for irrigation and drainage rather than using the water to only inadequately serve larger areas, which will then suffer more and more from salinity problems. He also pointed out that the water available in the rivers should be used for irrigation and drainage only to the extent that it can efficiently carry the sediments to the sea. If no consideration to this is given, the floods would be constantly on the increase. He also mentioned that the tube-well project of irrigation will help solve the salinity problem to a certain extent.

5. Council Meetings and Recommendations

At the meetings of the Council of P. I. O. S. A., consisting of heads of delegations from the member

countries, held on the 16th and 22nd November, 1960, a number of recommendations were discussed, and were taken up for consideration at the final session of the Congress on the 24th November, 1960, at which the following resolutions were unanimously adopted.

Resolutions

(a) *PIOSA Secretariat:*

1. The Congress, feeling the need for a Secretariat, decided: (a) to form a Secretariat, expenses of which will be met by voluntary contributions from the member countries; (b) to locate this secretariat immediately at Karachi in Pakistan.

2. It also decided that a Working Committee of four, consisting of (i) Dr. S. Siddiqui, (ii) Prof. A.D. Ross, (iii) Prof. M. S. Thacker and (iv) Prof. J. Millot, be entrusted with the drafting of suitable rules for the working of PIOSA and its Secretariat. The draft rules should be circulated to the members of the Council before the end of May, 1961, and the draft be finalized before May, 1962. The draft rules will be placed before the fifth Congress for ratification.

3. Pending the ratification of these rules, the office of the Secretariat will be governed by such of them as will be applicable to it.

4. The Secretariat will work under the guidance of the President, and will be responsible to the Council.

5. Resolved that the Secretariat of PIOSA collect and distribute among member countries information relating to scientific matters of topical interest, in cooperation with other appropriate bodies, and that, to this end, it bring out a quarterly bulletin or a news letter.

6. Resolved that the Secretariat work out some modus operandi to facilitate the obtaining of scientific materials, microfilms, exchange of publications, reports on the educational systems in these areas, preparation of a Bibliography of the Indian Ocean areas, etc., and to facilitate the expeditious supply of such materials to the member countries.

(b) *Other matters:*

7. The Congress noted that, after the adoption of resolutions 10, 11 and 12 by the third Congress held at Tananarive in 1957, extensive oceanographic studies have been projected by the International Council of Scientific Unions (ICSU)

through its special Commission, SCOR, and that high priority has been assigned to the study of the Indian Ocean. Resolved that member countries desirous of participating in the ICSU project may get in touch with ICSU and SCOR through appropriate national agencies, and that PIOSA lend whatever support it can to the Indian Ocean Expedition; also that the Secretariat be asked to collect all relevant information in this connection and make it available to the member countries.

8. Resolved that the Working Committee take such measures as may be necessary for effecting liaison with the Pan Pacific Ocean Association, the Scientific Council for Africa and similar other organizations, and arrange for exchange of information with these bodies.

9. Resolved that the Working Committee explore the possibilities as to the venue of the Fifth Congress, and of the following two Congresses if possible, make a recommendation at an early date, but not later than July, 1961, and submit it to the Council for decision.

10. Resolved that the scientific programme of future Congresses should comprise symposia, invited addresses and research papers, the organisation of which programme should be entrusted to a Programme Committee, to be appointed by the Working Committee of the Council after the venue of the Congress has been decided upon. Further resolved that the work of the Congress be organized under three major heads, namely:

- (i) Physical Sciences,
- (ii) Biological Sciences (both basic and applied),
- (iii) Social Sciences,

which between them will cover all the subjects coming under the purview of the present seven sections.

11. The Congress resolved that a panel of experts in the different scientific fields covered by the work of PIOSA be constituted, whose advice may be sought by the Secretariat and the various committees of PIOSA.

12. The Congress noted that in the teaching of science at the secondary school level, the biological sciences do not seem to receive at present the same attention as the mathematical and physical sciences, and wishes to emphasize the importance of keeping a suitable balance between the mathematical, the physical and the biological sciences.

The Congress considered a letter from the Secretary General of International Union of Geodesy and Geophysics, inviting PIOSA to nominate a scientist for liaison work with International Union of Geodesy and Geophysics. The Congress resolved that Mademoiselle G. Pillet be nominated as the liaison scientist, it being understood that this appointment will not involve any financial commitment for PIOSA.

6. Visits and Tours

While arrangements were made for the delegates to visit scientific places of interest, *i.e.*, Basic Medical Sciences Institute, the Laboratories of the P. C. S. I. R., the Fish Harbour, the Karachi University and the Cotton Research Institute, they

were also taken on recreation trips to Sandspit on the 18th November, 1960.

The P. C. S. I. R. extended full hospitality during the Congress to the leaders of the delegations and provided lodging to official delegates from the member countries participating in the Congress. Adequate arrangements were also made for providing transport facilities to the delegates, and the Ministry of Finance is to be thanked for allowing an estimated expenditure of Rs. 50,000, which was to be met out of the overall budget allocation of the P.C.S.I.R. The delegates were invited to a dinner by the Atomic Energy Commission, to tea by the Karachi University, also by the Association of Scientists and Scientific Professions, and to a reception and a farewell dinner by the P.C.S.I.R.