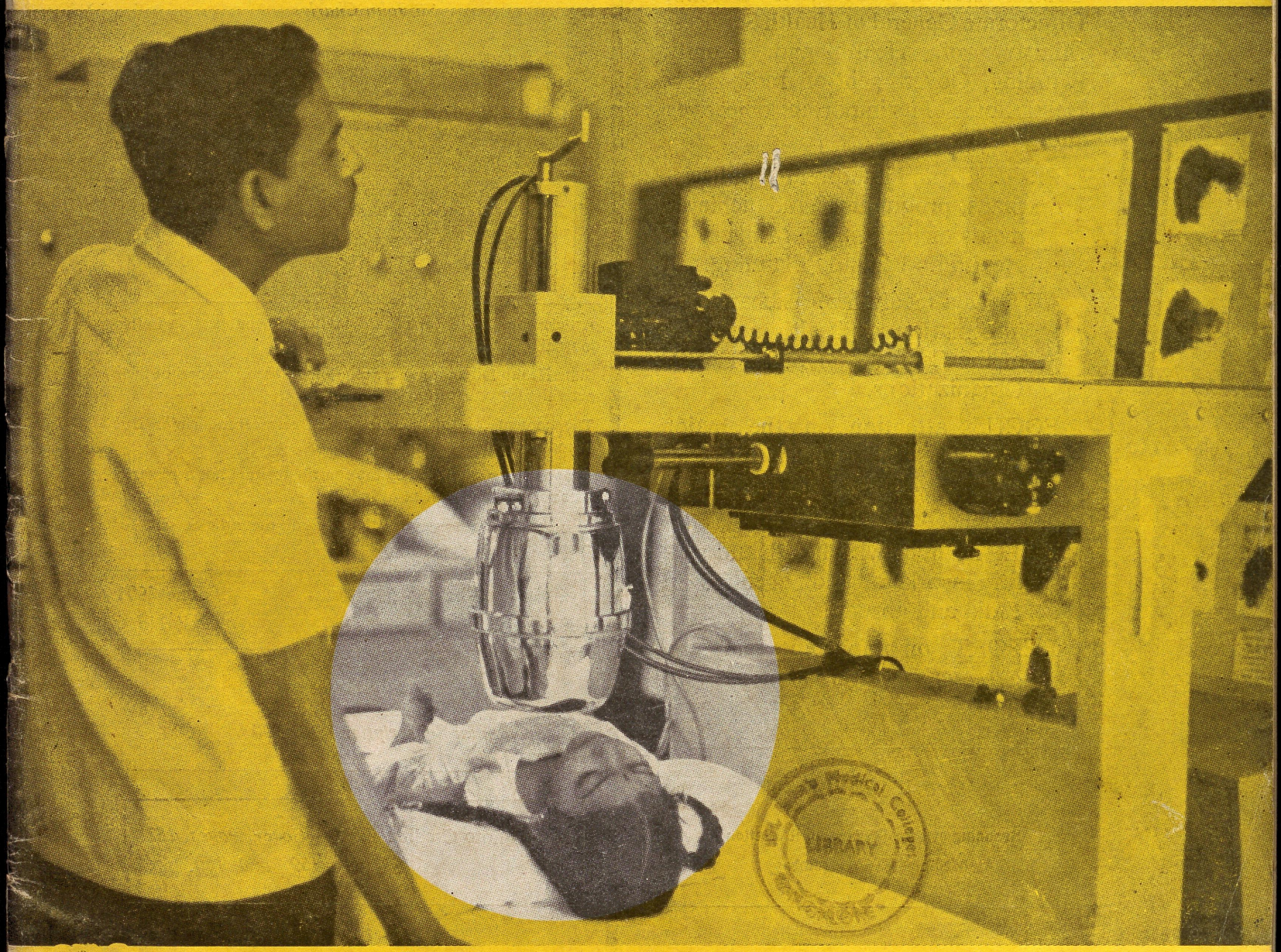
swasth hind



JUNE 1971

swasth hind

Objectives

Swasth Hind (Healthy India) is a monthly journal published by the Central Health Education Bureau, Directorate General of Health Services, Ministry of Health and Family Planning, Government of India, New Delhi. Some of its important objectives and aims are to :

PROJECT and interpret the policies, plans, programmes and achievements of the Central Ministry of Health and Family Planning.

ACT as a medium of exchange of information on health activities of the Central and State Health Organizations.

FOCUS attention on the major public health problems in India and to report on the latest trends in public health.

KEEP in touch with health and welfare workers and agencies in India and abroad.

REPORT on important seminars, conferences, discussions, etc., on health topics.

OUR COVER

Scanning of thyroid gland at Radiation Medicine Centre, Bombay

In this issue

Articles on health topics are invited for publication in this journal.

State Health Directorates are requested to send reports of their activities for publication.

The opinions expressed by the contributors are not necessarily those of the Government of India.

Swasth Hind reserves the right to edit the articles sent for publication.

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OUR MINISTER OF STATE FOR HEALTH AND FAMILY PLANNING

Prof. D. Chattopadhyaya

PROF. DEBIPRASAD CHATTOPADHYAYA has taken over as the Minister of State for Health and Family Planning from 2 May, 1971. Prof. Chattopadhyaya was elected to the Rajya Sabha in July 1969.

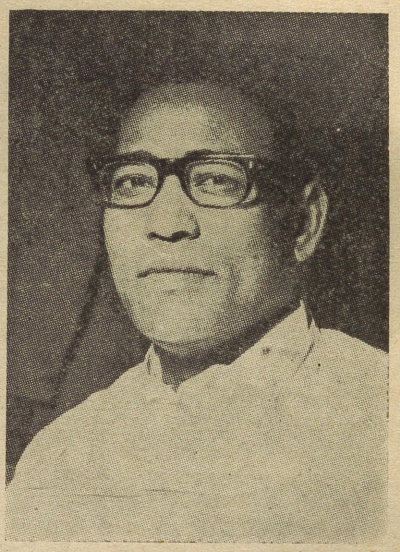
Born on 5 November, 1933 at Barisal (now in East Pakistan), Prof. Chattopadhyaya had his education at Krishnagar College, Calcutta University, and London School of Economics and Political Science. During his school days, Prof. Chattopadhyaya took active part in student movement.

An eminent educationist, he has held various positions in the field of education and social services. He had worked as a lecturer in B.K.C. College, Calcutta from 1956 to 1961. He was an active member of the West Bengal College University Teachers' Association. He joined Jadavpur University in 1964. Prof. Chattopadhyaya was the Founder-Secretary of the Jadavpur University Teachers' Association.

Prof. Chattopadhyaya worked as Secretary, Indian Academy of Philosophy, Calcutta. He occupied the offices of the President, South Calcutta District Congress Committee and is the Executive Member, Pradesh Congress Committee, West Bengal.

Prof. Chattopadhyaya has over 20 publications to his credit. His hobby is rhyming and versing. He has visited the United Kingdom, France, Italy, Australia, Indonesia, Singapore and Thailand.

DEPUTY MINISTER FOR HEALTH AND FAMILY PLANNING



A. K. KISKU

SHRI A. K. KISKU has taken over as Deputy Minister for Health and Family Planning from 18 March, 1971. Prior to this, Shri Kisku was Deputy Minister for Education and Youth Services.

Shri Amiya Kumar Kisku, 48, hails from Bhimpore and had his education at Bhimpore Santal High School. He secured his M.A. and B.T. degrees from the Calcutta University. He has a Master's degree from the University of California, Berkley, U.S.A.

Shri Kisku, who represents Jhargram (Scheduled Tribes) Constituency of West Bengal in the Lok Sabha, has held various positions in the field of education and social services. He was Principal of the Union Christian Training College, Berhampore. He occupied various offices in the national and provincial Christian Council of Education and Church Bodies. He was the Founder and President of the Etore Santal High School at Murshidabad.

Shri Kisku evinces keen interest in sports, particularly football and badminton. He was a member of the Murshidabad District Sports Association. Widely travelled, Shri Kisku has visited the United States of America, Canada, the United Kingdom, France, Germany, Italy and Switzerland.

As Deputy Minister for Education and Youth Services, Shri Kisku has made an intensive tour of the interior of West Bengal, Bihar and Assam and has intimate knowledge of the conditions of the people, which will stand him in good stead in his new office.

Advanced biological and medical research would receive a great stimulus, if our efforts are supported by a major programme of basic research. Radioisotopes have now made it possible to understand living processes in dynamic terms. A quantitative analysis of the intermediate steps operative in homeostates is possible with the help of this modern tool.

NUCLEAR MEDICINE IN THE SEVENTIES

DR VIKRAM A. SARABHAI

UNTIL artificial radio-activity was discovered by Rutherford in 1919, we were aware only of the high energy sub-atomic particles and wave radiation associated with cosmic rays and naturally occurring radioactive substances.

Most elements that naturally occur are stable. In other words, the atoms of these elements exhibit chemical properties which do not change with time. However, when these elements are bombarded by high energy radiation, such as neutrons from an atomic reactor or the beam of a high energy accelerator such as a cyclotron, every now and then an interaction occurs with the nucleus of the target element which gets transformed into an isotope, which has an atom of the same chemical element, but different mass, or an atom of a different element. These transformed nuclei are usually not stable and are called artificial radio nuclei. They emit other high energy radiations, just like naturally occurring radium does, but their activity of emitting such radiation decays with a very characteristic time period measured in terms of its half life. (Half life is the time required for half the atoms to disintegrate.) It is this property which is most valuable in the wide applications of radio nuclei for medical diagnosis. For instance, I^{131} (Iodine-131) used widely for diseases of the thyroid has a half life of 8 days and Tc^{99} (Technetium) has a half life of only 6.6 hours. Though short half lives present many special problems in the manufacture and distribution of radio pharmaceuticals, the great merit in their use lies in their selective absorption of different organs of the body and relatively little radiation burden imposed by them on the general system. While their activity lasts they provide unique information through radiation that they continue to emit after absorption in a particular normal or deceased organ of the body. The detection of the emitted radiation by external instruments is due to their great power of penetration. To put this matter in the correct perspective, let us note that while the quanta of X-rays have energy several tens of thousand times greater than in visible light, the Gamma-rays and the sub-atomic particles in radio activity have several million times the energy of visible light.

Diagnostic Purposes

An analogy might make clear the manner in which radio pharmaceuticals are used for diagnostic purposes. Suppose a child has been slapped. He would continue to cry for perhaps ten or fifteen minutes. During this period, anyone who is not hard of hearing would immediately be able to locate in a crowd not only the child, but also perhaps his parents who would be accompanying him. When the child recovers his normal composure there will be no way of distinguishing him or his parents from the rest of the individuals in the crowd.

The therapeutic use of radiopharmaceuticals is connected with the well-known effects of radiation on biological systems. Cobalt 60 with a half life of 5.3 years and Cesium 137 with a half life of 30 years are used in teletherapy units. 99 per cent of all *in vivo* nuclear medicine procedures use Iodine 131.

Some of the most important advances in nuclear medicine in recent years have been rendered possible through the availability of Technetium-99m, with its short half life. It is now considered almost an ideal radiopharmaceutical for a wide variety of applications. The very favourable nuclear characteristics of this iostope make it specially attractive for various diagnostic procedures.

Tc-99m is conveniently supplied through generators or milking units which consist of columns of chromatographic alumina on which the parent molybdenum 99 (half-life 67 hours) is firmly absorbed; Tc-99m is milked out of the column using dilute sodium chloride solution. The Tc-99m thus milked out can subsequently be converted into various chemical forms suitable for liver, spleen, lung, bone and placental scanning. The availability of such type of generators enables doctors located away from the production centres to use such short-lived isotopes in valuable diagnostic procedures.

For the production of Tc-99m generators based on chromatographic alumina, it is essential to have the starting material, *i.e.*, the parent molybdenum-99 with a specific activity exceeding one curie per gram. For the production of such high specific activity molybdenum-99 in substantial quantities it is essential to irradiate natural molybdenum at neutron flux exceeding 3×10^{14} neutrons per cm^2 per second. It is not practicable to prepare these generators from low specific activity molybdenum as the product Tc-99m is likely to be contaminated with excessively large quantities of molybdenum. Alternatively Tc-99m can be made available in a pure form after separation from the parent, but the short half life restricts the availability of this product to institutions which are readily serviced from the production centre. A procedure has now been standardized at Trombay for the production of pure Tc-99m from low specific activity molybdenum-99 and routine production and supply of Tc-99m as a guaranteed radiopharmaceutical is expected to be taken up shortly.

High Ranking in Production

Even though the first batch of indigenously produced radioisotope from the Apsara reactor was released for medical use in 1958, routine production of several radiopharmaceuticals on a fairly large scale was taken up at Trombay towards the end of 1963 with the start up of the CIRUS reactor. At present more than 50 different radiopharmaceutical preparations are on the production list. Considering the range of products produced completely in India, we rank among the top five to six countries supplying radiopharmaceuticals in the world.

While significant progress has thus been made in the development and routine production of radiopharmaceuticals in this country, in the matter of their application in Nuclear Medicine, India has lagged way behind the advanced countries and is even well behind some other developing countries. While there are about 65 medical institutions currently using radiopharmaceuticals in India, excepting three or four centres, all others are confined to thyroid uptake studies using radio-iodide. In the U.S.A., about 40 million dollars worth of radiopharmaceuticals are consumed annually. In Japan, this figure is over 2.5 million dollars. In India, radiopharmaceuticals valued at only 80,000 dollars (Rs Five Lakh) were used in 1969.

From a modest number of 400 consignments in 1961 we reached a figure of over 10,000 consignments per annum in 1968 with a doubling time of approximately two years up to 1965. After this rapid progress, there has been stagnation. This is not because the Nation's needs are fully met. Far from it. Australia during 1967-68 carried out 5.6 investigations with radioisotopes per 1000 of population, Denmark 7.1, Japan 1.7, New Zealand 2.4, Sweden 6.1 and United States in 1966 a figure of 9.2. The corresponding figure for India is only about 0.05 per 1000 of population. There are at present about 80 medical radioisotope users in the country and among them

Photo on right shows scanning of thyroid gland at Radiation Medicine Centre, Bombay. →

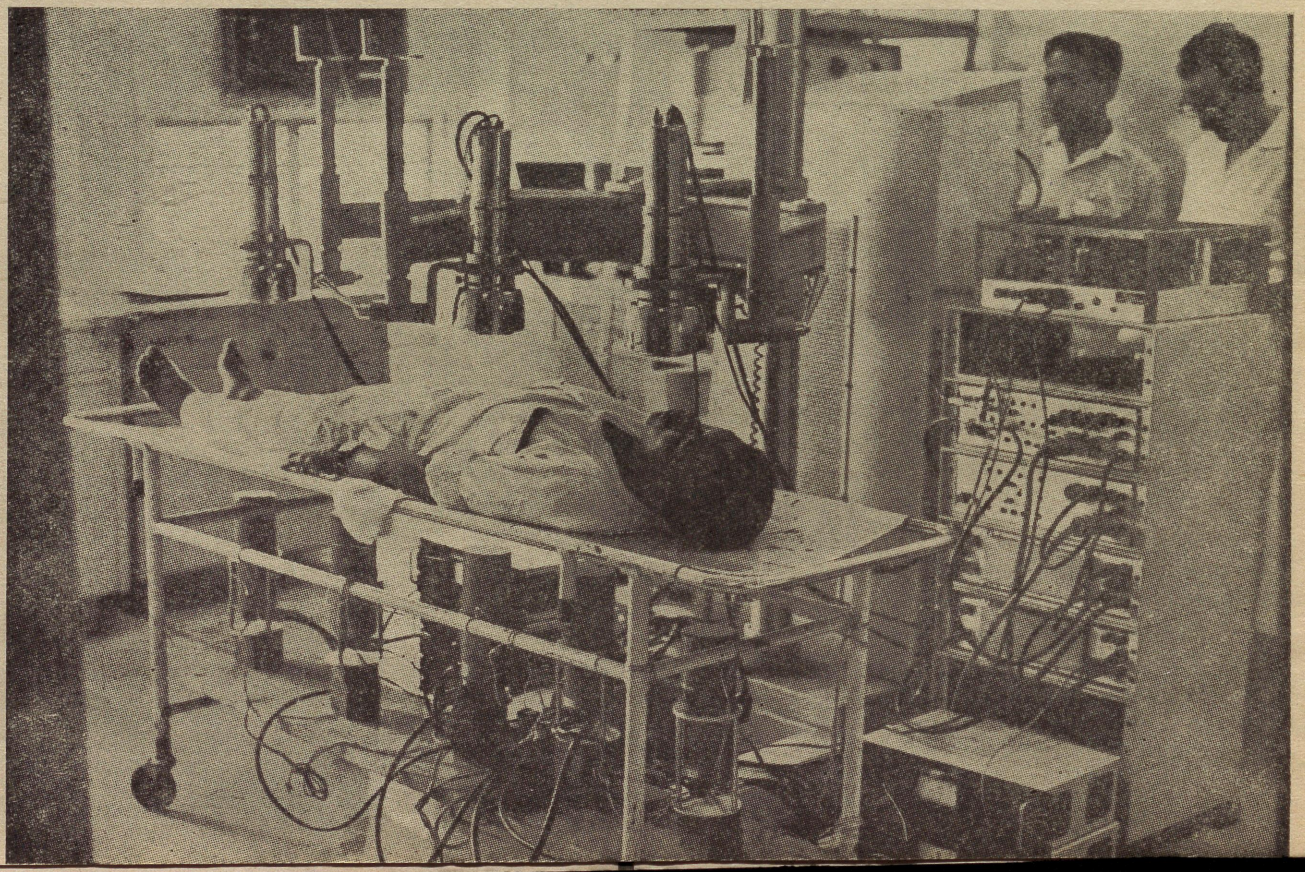
there are perhaps only 2 or 3 institutions which account for more than 80 per cent of the consignments of radioisotopes.

There is a possibility of drawing erroneous conclusions when we compare figures in India with those in industrially more developed nations enjoying a much higher standard of living. However, experience in Greater Bombay related to the Radiation Medical Centre of the Bhabha Atomic Research Centre provides a good indication of what can be achieved at least in our metropolitan and urban areas. The number of investigations conducted per year per 1000 of population of Greater Bombay works out to two, a figure comparable to Japan and New Zealand. We should note that the Centre is not merely a well equipped clinic for nuclear medicine but undertakes training of doctors in various aspects of nuclear medicines and the Bombay University itself has recognized nuclear medicine as a speciality and has instituted a diploma in radiation medicine. A similar diploma for technicians has also been instituted.

Until recently little progress was made in this country in some of the most important areas of nuclear medicine such as scanning, primarily because of non-availability of adequate funds for scanners, ancillary electronic equipment and accessory facilities and infra-structure. The Electronics Corporation of India, a public sector enterprise of the Atomic Energy Commission, is now marketing these. In the U.S.A., with a population of 200 million there were more than 6,500 hospitals and licensed doctors using radiopharmaceuticals in 1969 with an average of 100 new nuclear medicine facilities being added each year. There were about 10,000 scanners and 300 scintillation cameras in use. In Japan with a population of 100 million, there are 3,500 scanners. There are at present just 11 scanners in the whole of India and just one scintillation camera.

Taking all factors into consideration, it is perhaps reasonable to aim to provide a target of two investigations per thousand of urban population by 1975. This would involve approximately 100,000 investigations per year. Once the infra-structure is established a doubling time of two years is quite reasonable taking our past experience and that of other countries into consideration. On this basis, India would need to provide for approximately 0.75 to one million investigations by 1980.

Dynamic radioisotopic uptake studies (e.g., renogram for kidney function) at Radiation Medicine Centre, Bombay.



Thyroid uptake after administration of a tracer dose of radioiodine.

Following the style of the systems analyst, let us examine what is involved into be able to provide modern radiation medicine in this country on the scale envisaged. At least five major initiatives that would be needed can be identified in this regard.

Adequate Supply and Distribution

First, India must ensure the availability of an adequate supply of radiopharmaceuticals at reasonable price. The starting up of the large power reactors during the next 3—4 years at Ranapratap Sagar (in Rajasthan) and at Kalpakkam (in Tamil Nadu) would give us the ability to produce about 3 million curies of radio cobalt annually. We shall also have the Variable Energy Cyclotron at Calcutta. This 80 *Mev* accelerator is under construction. But apart from the bulk supply of isotopes we would need chemical processing facilities and one such large unit is under construction at Trombay. At present the manufacture of radiopharmaceuticals is carried out on a very small scale at the Bhabha Atomic Research Centre and a large unit for dispensing and testing would be needed. The distribution of radiopharmaceuticals calls for special arrangements for transportation by airplanes with minimum hold-ups in transit and special precautions to be undertaken for handling the consignments. This needs effective coordination with civil aviation in this country.

Second, we should augment the availability from local manufacture of modern instruments as well as create a distribution and servicing organization to maintain them in good order.

Training of Doctors and Technicians

Third, we need more programmes for the training of doctors and technicians. In providing them spe-

Radioassay of urine with automatic well counter at Radiation Medicine Centre, Bombay.

cialized institutions such as the Radiation Medicine Centre, the Atomic Energy Commission would have a very important role to play. So also can training be given at selected Medical College Hospitals. With about 80 medical users of radioisotopes, we will have to have as many as 1500 persons both medical and para-medical to be trained in the medical applications of radioisotopes.

Fourth, one would need the establishment of an adequate number of units for radiation medicine in public hospitals and private clinics. This could be achieved by establishing a number of small radioisotope laboratories which are supported by a few large centres. There are at present 95 medical college Hospitals in India concerned with undergraduate and post-graduate medical education distributed among the various States. This figure will increase to 105 by the end of the Fourth Plan.

Setting up of small radioisotope laboratories in each of these medical institutions would serve a large cross-section of at least the urban population and also provide an unique opportunity for training of the medical and para-medical personnel attached to these institutions. It is estimated that a small radioisotope laboratory can carry out about 5,000 radioisotopic investigations per year and commissioning of 105 radioisotope laboratories, though a phased programme would, by 1980, ensure a substantial coverage. The small radioisotope laboratories in the various medical institutions proposed above, require to be supported by regional or zonal institutions which by their facilities and inter-disciplinary representation among the staff, would be in a position to provide such of these advanced techniques in diagnosis and treatment which would not be possible at the peripheral radioisotope laboratories in the region, and also be responsible for carrying out research in problems peculiar to the region. Such institutions will have a multiplier effect on the overall development and progress of medicine at the national level. There would be need for an advisory service run by the Atomic Energy Commission to assist the setting up of these clinics and for special technical information which may be required.

Finally, there would arise a need for radiation protection of the workers engaged in the expanded programme of radiation medicine. We are already well established to undertake this through the Directorate of Radiation Protection of the Atomic Energy Commission.

With the availability of high activity radio Cobalt from our atomic power stations, we shall be able to augment in two years the supply of indigenous teletherapy units to satisfy the large demand which exists today. India has currently only 45 teletherapy units against about 600 in Japan and about 1500 in the United States.

Sterilization of Medical Products

An important application of Cobalt 60 in the field of medicine is for the radiation sterilization of medical products like sutures, disposable syringes and surgical dressings. A large facility for radiation sterilization is now being planned with assistance from the U.N.D.P. It is expected that by the end of 1972 or early 1973, a plant will be operating at Trombay and will serve to sterilize medical products manufactured in the Bombay area. The capacity of this plant will be progressively stepped up to cater to requirements up to a maximum of one million cubic feet per year. It is also proposed to set up three other large sterilization plants in the Fourth Plan period in other regions in the country, where market surveys reveal a demand for such sterilized products. These facilities will serve to upgrade the quality of medical products available.

Basic Research

If India is to be amongst the advanced nations in the world in the field of radiation medicine, our effort will have to be supported by a very major programme of basic research. Radioisotopes have now made it possible to understand living processes in dynamic terms. A quantitative analysis of the intermediate steps operative in homeostates is possible with the help of this modern tool. Prior to the advent of radioisotopes, majority of the conventional diagnostic aids were either static bits of information in established diseases or were more in the nature of confirmation of a clinically suspected condition. The results of such investigations generally failed to provide a comprehensive picture of the processes leading to the diseased state.

(Based on the Bhabha Memorial Lecture of the Society of Nuclear Medicine, India, delivered by Dr Vikram A. Sarabhai, Chairman, Atomic Energy Commission, in New Delhi on 21 October, 1970.)

INSTITUTE OF NUCLEAR MEDICINE AND ALLIED SCIENCES

COL. S.K. MAZUMDAR

The Institute of Nuclear Medicine and Allied Sciences has a wide array of sophisticated equipment for research and practice in medicine. It carries studies on pathological effects of ionizing radiation and problems of radiation hygiene and health physics.

NUCLEAR medicine is a new branch of medicine and involves uses of radioisotopes, radiochemicals and ionizing radiation for diagnosis, therapy and research. It is a specialized field demanding close integration of a number of disciplines like physics, nuclear electronics, chemistry, biochemistry, biology, clinical and experimental medicine.

The Defence Research and Development Organization of the Ministry of Defence started a Radiation Cell at the Defence Science Laboratory, Delhi, in the latter part of 1956 for stimulating interest in nuclear medicine. The Cell witnessed a rapid expansion in the volume of its work in the first few years. Expansion of the programme of radioisotope application in medicine was greatly facilitated from 1959-60 onwards when radioisotopes were made available by the Bhabha Atomic Energy Establishment, Trombay, Bombay. A radioisotope clinic was established at the Safdarjang Hospital, Delhi, in 1959.

In 1961, the Institute of Nuclear Medicine and Allied Sciences (INMAS) was established incorporating the Radiation Cell. During the early part of 1963, the INMAS moved to its present premises. At present it has clinical departments and a number of scientific divisions, a hot laboratory and supporting units like electronic and general workshop, animal house and a library. The central administration, located at the Institute, co-ordinates the activities of the clinical field units at the Army Hospital, Delhi Cantonment, and the Electron Microscopy Division at Metcalfe House, Delhi. It is also concerned with outstation training at Armed Forces Medical College, Poona, Army Medical Corps School and Centre, Lucknow, Defence Services Staff College, Wellington and Infantry School, Mhow.

The objectives of the Institute are:

(*i*) Promotion and development of radioisotopic and related modern techniques in medical research, diagnosis and therapy as well as research in allied sciences, such as medical radiation biology, pathology, health physics, etc.

(*ii*) Provide specialist advice on matters pertaining to radiation medical sciences.

(*iii*) Development of radiation hygiene and health protection practice.

(*iv*) Provide training facilities in nuclear medicine.

(*v*) Provide electron microscopic facilities for biomedical research and also to support Research and Development laboratories and establishments for their research programme.

The Institute is at present guided in all its scientific activities and other problems by a Governing Council. The various programmes of this Institute are carried out by the following divisions : Scientific Medical, Biomedical, Radiation Pathology, Health Physics and Radiation Hygiene, Electron Microscopy, Instrumentation, Experimental Medicine, Radiation Biochemistry and Radiation Chemistry. The staff consists of specialists from different disciplines, and include clinicians, medical specialists, health physicists, and radiation chemists, biochemists, radiation safety technicians, and specialists in electronics.

The work of INMAS relates to thyroid diseases, heart diseases, blood disorders, neurological disorders (such as Parkinsonism), human organ scanning, studies on pathological effects of ionizing radiation and on problems of radiation hygiene and health physics.

Thyroid Disorders

Radioiodine has been successfully used in the treatment of certain categories of thyroid disorders, including post-operative recurrence of hyperthyroidism, thyrotoxicosis with heart diseases and hyperthyroids resistant to anti-thyroid drugs. Partial radiothyroidectomy has been found to be extremely effective in certain categories of heart diseases, especially intractable congestive heart failure and angina.

Other types of radioactive isotopes like ^{51}Cr, ^{59}Fe, ^{203}Hg-Neuhydrin, ^{58}Co-Vit B_{12}, ^{131}I-labelled oleic acids, triolein and Hippuran are being routinely used in haematological disorders, malabsorption syndrome, kidney function studies and liver diseases. By using ^{24}Na a simple technique for extra cellular fluid volume determination has been developed for clinical diagnosis. INMAS is also actively engaged in developing organ scanning techniques by using suitable radiochemicals.

Entomological studies with radioisotopes and ionizing radiations are being carried out for control of vectors of diseases. The Institute has a wide spectrum of nuclear electronic equipment for work in nuclear medicine. Special mention may be made of radioisotope scanner, multichannel pulse height analyser, low level counter, air monitor, liquid scintillation counter, etc.

Today, radioisotopes are being widely applied in the investigation and treatment of thyroid disorders, blood diseases, cardiac and peripheral vascular conditions, kidney functions and liver disorders. India is among the few countries engaged in this field.

The Institute has an electron microscope which is used not only for biological investigations of direct interest to INMAS but also for other Defence Establishments in their problems on metallurgy, corrosion and solid state devices.

Animal house has been organized for breeding and maintaining special strains of mice, rats, guinea pigs, rabbits and dogs. These are used in studying the pathological effects of radiation and standardization of isotopic techniques before using them on human beings. This animal house has a special Hot Animal Room for keeping and operating on animals which have been administered radioactive medicine.

The technical workshop of the Institute helps in design and fabrication of several items of remote control and other radiation safety instrumentation.

Training Programmes

The Institute takes a major share in running the one-year Post-graduate Diploma Course in Radiation Medicine (DRM) of the University of Delhi. The Institute also runs short-term (6-8 week) courses in nuclear medicine and radioisotope methodology for medical specialists and technicians of the Armed Forces Medical Services.

The Institute centralizes facilities, techniques and instrumentation for the progress of the nuclear medicine. Integration of medical and allied sciences has become more cohesive. To this extent the foundation for nuclear medicine as a true specialization has been broadly achieved. □

LABORATORY SERVICES IN INDIA

DR C.P. NAIR

HEALTH Laboratory services in India had grown mostly as an appendage to medical colleges and hospitals with main emphasis on the curative aspects. Public health laboratories wherever existed, developed independently and remained as a major concern of the municipal health departments and were designed to carry out bacteriological/chemical examination of water, milk, dairy products and food. Manufacture of biological products emerged as a private enterprise. Investigations of infectious and communicable diseases, both in the laboratory and in the field, did not receive adequate attention. As such, the laboratory services were developing in a haphazard way.

In 1946, the Health Survey and Planning Committee headed by Dr J.S. Bhore, stressed that public health laboratory services should form an integral part of good public health services and that in any communicable disease control eradication programme, there should be sufficient number of adequately-staffed and well equipped public health laboratories to undertake laboratory and field investigations. The Committee recommended that there should be chain of laboratories in each State for the proper development of public health services.

The WHO Expert Committee on Laboratory Services has also pointed out that Public Health Laboratory Services should form an integrated part of good health services as the laboratory has a very important role in the prevention of communicable diseases. The Committee has recommended National Public Health Laboratory Services with Central, Regional, District and Peripheral laboratories. The Government of India, taking note of this, decided to organize health laboratory services in the country at different levels of health administration in a phased manner taking into account the available financial and technical resources, man-power and the country's practical and immediate interest.

It should be realized that in a vast country like India, the health problems are different in the different regions. Further, health is a State subject. However, the Primary Health Centre is the base of planning and commencing all specific health operations and of taking the services to the people. Even though centralized administration exists to tackle certain diseases like Malaria (during attack and consolidation of the eradication programme), filaria, smallpox, tuberculosis and leprosy, the District Medical and Health Organizations and the Primary Health Centres constitute the basic framework for providing health services to the rural population. In this connection, a pyramidal structure with three clear distinct levels from the centre to the periphery is the organizational pattern considered good for providing health services in the country. The local level comprises the peripheral functioning units, *viz.*, the Primary Health Centres, the intermediate level comprises district and regional level laboratories to provide guidance and on-the-spot supervision of the local level, and the central level comprises Principal/State Laboratories to set-up standards, policies, etc., and to ensure uniformity in the general direction of the entire system.

At present, the development of health laboratory services varies from State to State and even within a State from district to district. In most of the States, intermediate and peripheral activities are relatively few, and still in a rudimentary stage. Efforts are, therefore, being made to organize fully the services on a uniform pattern to operate it at all levels by establishing laboratories at State, regional and district levels to serve primary health centres as well as other health services and to develop laboratory referral services, particularly those within the regional and the district health organization. Laboratory side-

room facilities will also be developed at all primary health centres. The progress achieved so far in the country in the organizational development of the programme is indicated below.

Health Laboratory Services At Peripheral Level

A total of 5,055 primary health centres are now functioning in the country (up to 30 June, 1970) of which 2,527 are in areas where malaria programme has entered the maintenance phase (up to 30 March, 1970). According to the recommended pattern, each of these 2,527 primary health centres invariably have some sort of clinical side-rooms with a single skilled laboratory worker. In areas where malaria programme has not entered maintenance phase, a doctor-incharge of these primary health centres carries out the laboratory investigation depending upon the facilities available. A total of 2,615 primary health centres have received UNICEF assistance (up to 30 June, 1970), including one compound microscope as equipment. Staffing pattern at primary health centre level includes medical officers, computer, laboratory technician, etc.

Intermediate Level Laboratories

Realizing the vacuum in laboratory services in public health programmes, the Government of India included a scheme, "Development of Public Health Laboratory Services", in the Second Five Year Plan. The scheme envisaged the establishment and maintenance of well-equipped and staffed public health laboratories at selected centres at State, Regional and district levels. The responsibility of developing these laboratories rested with the State Government but the Centre encouraged the State Governments by providing financial assistance to meet 75 per cent non-recurring and 50 per cent recurring cost. The funds for Central asisstance were provided every year but due to non-availability of trained personnel, suitable accommodation, etc., only seven principal, four Regional and 121 district laboratories could be established in Andhra Pradesh, Assam, Bihar, Kerala, Mysore, Orissa and Punjab. During the Third Plan and in the Fourth Plan period consolidated grant has been given to each State to develop Laboratory Health Services according to the needs and limitations. The jurisdiction, therefore, is not confined to the urban areas of the district headquarters but extended also to receive material from rural areas.

There are altogether 341 districts in the country but the number of district laboratories so far established comes to about 171. Out of these only 95 district laboratories are fully equipped.

The district laboratories are required to provide adequate diagnostic, bacteriologic and referral services and training. They may be located in the premises of the district hospitals or in any other suitable health institution. A minimum area of 90 sq. metre each should be available for :

(*i*) reception, registration and administration,
(*ii*) collection of specimens, their conditioning and despatching,
(*iii*) microscopes, clinical and food chemistry,
(*iv*) bacteriology including water analysis and serology,
(*v*) still plant washing and sterilization, and
(*vi*) storage units of the laboratory. A section of chemistry will be provided in the public health services unit of the laboratory. Each working unit should have running water and sink and power points. Suitable arrangements will be made for the incineration of highly contaminated material. Subject to availability of space, separate room will be provided for (*i*) the officer incharge of the laboratory, and (*ii*) coordinating meetings, and library.

Services

Staff recommended to carry out services *viz.*, 'Diagnostic', 'Referral' and 'Training' at district laboratories is as follows :

(*i*) *Diagnostic :* In support of clinic public health services. (*ii*) *Referral:* In support of epidemiological and basic health services. (*iii*) *Training*: Field Microscopists: (*a*) *Professional:* District Laboratory Officer (Medical or Veterinary Graduate) with at least two years' laboratory experience (1) OR A science graduate (M.Sc. in Microbiology and with a diploma in laboratory technology and at least three years' experience in health laboratory (1) OR B.Sc., M.L.T. (Medical Laboratory Technician) with five years' experience in Microbiology in State Health Laboratory (1) ; (*b*) *Scientific :* (*i*) Junior Scientific Officer (B.Sc.) (2) ; (*c*) *Technical :* (*i*) Laboratory Technicians (4) ; (*d*) *Auxiliary :* (*i*) Clerk-*cum*-Typist (1) (*ii*) Laboratory Attendants (2).

To make the Public Health Laboratories function as referral laboratory, the UNICEF has been providing assistance since 1950, in the form of some equipment to selected district laboratories which fulfil the essential criteria. Eighty-five district public health laboratories received such assistance by the end of 1968. During the period of five years synchronizing with the Fourth Five Year Plan, *i.e.*, 1969-74, fifty more district health laboratories are to be upgraded with UNICEF assistance. Out of this, twenty district health laboratories have already qualified for receiving the assistance in the two years 1969-71. This assistance is in the form of a standard set of equipment and the ten laboratories that qualified in 1969-70 have started receiving the equipment.

At District level, the Chief District Health Officer/District Medical Officer of Health is responsible for the development of the project and for the direction and supervision of the work of Primary Health Centres as well as for ensuring the necessary referral and consultative laboratory services.

Under the vertical functional organization of malaria eradication, local malaria eradication units at District level in the non-malaria maintenance areas run separate single purpose malaria laboratories to help epidemiologists in arriving at a speedy diagnosis and make epidemiological interpretation and evaluation so essential for the success of the programme. The strength of microscopists working in such laboratories is one per one lakh population. Such laboratories exist in over 43 per cent of the total number of districts. These microscopists are well trained in making correct readings and they form invariably the nucleus for the future peripheral single skilled worker laboratories when these areas enter into malaria maintenance.

There are about 17 health laboratories in the country coming under the category of regional laboratories. Eleven more regional laboratories have been proposed to be established in the different States during the Fourth Five Year Plan period. The ultimate aim is to establish one regional public health laboratory for a population of about five million or one regional laboratory for four to five district public health laboratories. It is likely that UNICEF assistance to strengthen about five regional laboratories may become available during 1972-74; these regional laboratories will be developed to take up all essential referral services so that they may act as model laboratories.

In the layout of the regional laboratory building, there should be separate units to provide facilities for offices, records, stores, different laboratories like biochemistry haematology, microbiology, serology, histology, animal house, room for sterilization, etc., refrigeration, gas production, instrument (air-conditioned), specimen collection, test meal, metabolic rate testing, apart from room for waiting, toilet, etc.

The staff required for the regional laboratory should be of the following category:

1. Bacteriologist, Biochemist and Junior Pathologist(1 each)

   or

   Senior Medical Officer (1)
   Senior Scientific Officer (1)
   Junior Scientific Officer (2)
2. Laboratory technicians (2)
3. Laboratory attendants (7)
4. Clerk/Typist (1)
5. Store-Keeper (1)
6. Peon (1)
7. Sweepers (2)

Principal Central Level Laboratories

About 28 Principal (State) laboratories, some of which dealing only in specialized subjects are functioning as Referral Laboratories at State level but the facilities provided by these laboratories are inadequate for the needs of the country. The Table (on page 167) shows the number of Intermediate and State laboratories existing today in the various States of the country. In addition to these, separate State laboratories for malaria are functioning under the National Malaria Eradication Programme, particularly in States that have not completely entered into the maintenance phase of the programme for cross checking of slides and confirmation of positives and to support epidemiological surveillance.

National Level Laboratories

At the National level, the country possesses about 13 excellent laboratories of specialized nature.

There are also six referral laboratories at National level under the National Malaria Eradication Programme for independent cross checking and for support to the field investigations undertaken to

TABLE

Laboratory Services in the various States

S. No.	States/ Union Territories	No. of Distt.	No. of Distt. Laboratories	No. of Distt. Labs. Received UNICEF Assistance	No. of Regional Labs.	No. of State (Principal) Labs.	Remarks
1.	Andhra Pradesh	21	15	8+3	4	1	
2.	Assam	11	5	5	1	1	
3.	Bihar	17	15	3	—	1	
4.	Gujarat	19	16**	8+1***	1	1	**Subject to further
5.	Haryana	7	4	4	1	3	confirmation from
6.	Jammu & Kashmir	8	2	2	—	—	the State.
7.	Kerala	10	4	4	—	1	***Including one
8.	Madhya Pradesh	43	20	12	7	—	principal labora-
9.	Tamil Nadu	13	16	6	—	1	tory.
10.	Maharashtra	26	5	5	—	3	
11.	Mysore	19	13	3	—	1	
12.	Nagaland	3	—	—	—	—	
13.	Orissa	13	6	4	3	1	
14.	Punjab	11	3	3	—	6	
15.	Rajasthan	26	5	5	—	2	
16.	Uttar Pradesh	54	29	6	—	1	
17.	West Bengal	18	9	9	—	—	
18.	A. & N. Islands	1	—	—	—	1	
19.	Chandigarh	1	—	—	—	—	
20.	Delhi	1	—	—	—	2	
21.	Goa, Daman & Diu	1	—	1@	—	1	@Principal (Lab.)
22.	Himachal Pradesh	10	2	2	—	1	including Dadra &
23.	L.M. & A. Islands	1	—	—	—	—	Nagar Haveli.
24.	Manipur	1	—	—	—	—	
25.	N.E.F.A.	1	—	—	—	—	
26.	Pondicherry	4	1	—	—	—	
27.	Tripura	1	1	1	—	—	
	INDIA	341	171	93+2	17	28	

tackle technical problems confronted from time to time in the implementation of the programme.

Technical Manpower

(*a*) *Laboratory Technicians*—While health laboratory services are becoming increasingly important there is conspicuous shortage of health laboratory personnel. About 44 centres in 14 States have started one-year certificate course for laboratory technicians/ laboratory assistants. About 1,000 students are admitted every year.

(*Contd. on page 181*)

MEDICINE, HEALTH AND GOVERNMENT : The Future Outlook

SIR JOHN CHARLES

THE purpose of the Jacques Parisot Foundation is to perpetuate the memory of that great medical and social philosopher through a lecture on an appropriate subject to be delivered during the course of the annual World Health Assembly.

Sir Jacques Parisot was an unusual combination of physician, man of affairs, educator, leader, and patrician. He was a man, austere, sensitive, even shy, but fertile in ideas and resolute, competent, and consistent in action. Above all, he was dedicated to the creation of a world in which health and social justice should be available to every man.

It was with Parisot in mind—with the knowledge of his interest in medicine, health, and government—which were at the heart of all his activities for nearly half a century—that I have chosen this triad and their future evolution as the subject of my lecture.

The Three Links

Medicine, health, and government are undoubtedly elemental forces in their own right, but I have preferred to regard them as three of the links in that chain of concepts which are necessary to ensure the fulfilment of the objective of the World Health Organization, namely, "the attainment by all peoples of the highest possible level of health". There are many other links in the chain—nutrition, population, national development, education—and all of them essential. But, without depreciating the importance of these other factors, the isolation of our triad of medicine, health, and government simplifies the approach to the study of the immediate practicality and future potential of the WHO objective.

By way of further simplification, it may be useful to declare in broad terms what each of the members of the triad is intended to mean. I perfer to do this rather than put them separately within the strait jacket of a formal definition, for it has been truly said that every definition is dangerous.

With regard to our triad, the concept of medicine is perhaps the most difficult to describe for it comprises a polyhedral conglomerate of traditions, sciences, techniques, established institutions, and workers in separate disciplines. Compactly and yet broadly, medicine is that department of knowledge and practice which is concerned with the cure, alleviation, and prevention of disease in human beings, and with the restoration and preservation of health. Medicine applies to human beings as individuals and in the mass, and, because one of its major subdivisions is designated 'practice', we must also include the practitioners of the art at all levels together with their education and training. Furthermore, because medicine is not static, the sciences and technologies concerned with its advancement, which normally depend on and derive from research, must also be taken into consideration. This is a description which may appear to have the enveloping capacity of a blanket and the clarity of a fog, but for our present purpose it has the virtue of comprehensiveness and must serve.

For health, there is an almost embarrassing choice of descriptions. The most preposterous is that of the Irishman who said that "one knows so well the popular view of health. The English country gentleman galloping after a fox—the unspeakable in full pursuit of the uneatable".

Eighteen hundred years ago, Galen, the Graeco-Roman physician, left us a veritable litter of definitions, some of which are still in tune with modern popular thought. They are remarkable in that they reflect separate facets of the basic concept, as can be seen in the following three examples. "Health is a sort of harmony, but its range is very wide and does not exist to the same extent in all of us". "That condition in which we do not suffer pain and are not impeded in the activities of life is what we call health." And finally: "Health exists in the perfection of functions and organs."

And yet, perhaps, none of Galen's definitions has the simplicity of the description we find in the preamble to the Constitution of the World Health Organization—"Health is a state of complete physical, mental and social well-being, and not merely the absence of disease or infirmity". By some critics, this clear proclamation has been regarded as being perfectionist and unduly dogmatic. And yet—just like the American Declaration of Indepenence—it was hammered out word by word, humbly and with hesitation, by the anonymous draftsmen who served the International Health Conference which met in New York in July 1946.

Tom Paine, the author of *The Rights of Man* and a full-citizen of three countries—England, France, and the United States of America—was of the opinion that "government, even in its best state, is but a necessary evil ; in its worst state, an intolerable one". Government has also been described as "the ambition of fools, the plaything of politicians, and the burden of the governed". But these colourful descriptions do no more than underline the fact that governments, like the fallible human beings of which they are composed, reflect a medley of virtues and vices. For our purpose, government implies the existence within a state of supreme authority, a conclusive power, which directs and controls the actions and affairs of the people. We are not concerned whether governments favour the communist or democratic systems or are in the hands of dictators. Our only interest in this immediate context lies in the existence of an executive authority.

Having thus evaded the constraints of precise definition, let us now examine the present state of each member of the triad of concepts in the world of today, and review the trends and tendencies which they respectively exhibit. In doing so, we will rely upon reasonable projections of those trends and tendencies rather than upon speculation or the exercise of the creative imagination. Nor will we anticipate the appearance of new diseases, the development of revolutionary remedies, or the recrudescence of mass aggression in the form of war.

It is a trite truism to refer to the advances in the medical and kindred sciences during the past three decades as being both unprecedented and prodigious. It is also an inescapable fact that one half of the world's population share only partially—even minimally—in these advances.

This, however, is the old dilemma which has its roots not in medicine itself but in the differing socio-economic circumstances of states and governments, and these circumstances are particularly unpropitious in the developing world.

But even in developed countries medicine and medical practice are manifesting changes, which may be inevitable but are nevertheless ominous, not only in themselves but because of their possible repercussions in less advanced countries.

It is possible to mention only a few of the more significant of these changes.

In a recent number of a well-known English medical periodical there appeared an article which stated bluntly in its opening paragraph : "There should be no more appointments with the title of Professor of Medicine". The writer was himself a professor of medicine, and, as the majority of the whole-time academic chairs of medicine had been created during only the previous fifteen years, he apologized for the form of delayed infanticide he was proposing. His theme was that within the departments of medicine in university hospitals there would be persons distinguished in various subjects—cardiology, neurology, and the relative newcomers, endocrinology, haematology, nephrology, and the like—who should be given appropriate professorial titles. They would discharge their clinical, teaching, and research functions independently, but would be brought together regularly under a chairman drawn from their ranks to discuss common problems concerned with teaching and administration.

I do not propose to comment on this suggestion, except to draw attention to it as an indication of that fragmentation of medicine which is often regarded as a logical and inevitable development. But it is this fragmentation which frequentatly makes it difficult for the patient to find a physician who will regard him not as a hypnotized figure in transit between specialists—the human package in search of a synthesized diagnosis—but as a whole man and an individual person.

This fragmentation is also beginning to appear within the sphere of activities which are the concern of many of us here. The all-purpose public health worker is obviously destined for obsolescence. He is beginning to be supplemented, and sometimes superseded, by a group where the epidemiologist, statistician, medical economist, sociologist, and medical administrator can be separately identified and plough their respective and distinctive furrows in the field of public health or community medicine.

Lack of Communications

Related to this fragmentation is the increasing impersonality in medical care of the individual patient and even of the community. There are no more common complaints directed against the medical profession in many industrialized countries than the lack of communication between patient and doctor and the all too frequent personal detachment of the latter.

It is possible also that, in the hospitals of the Western world, medical care has become so science-orientated that, to some extent, the latter half of the old injunction "to cure when possible, but to comfort always" has been temporarily overlooked. Nor is it any consolation to the patient that his existing disabilities can be aggravated by an additional, gratuitously acquired disorder of iatrogenic, pharmacological, or institutional causation.

These complaints may appear trivial but they are relevant to the changing status and image of the medical profession.

Turning to another topic, which is under heated discussion everywhere at the present time—research. The question at issue is usually not so much the nature and quality of the research effort as the amount of time which, in the university or teaching hospital, should be allocated respectively to patient care, teaching, and research. And the question becomes especially pertinent when the hospital concerned has heavy responsibilities to the surrounding community for its medical care. Nevertheless, the time has passed when, to quote Sir Harold Himsworth, research was "still largely regarded as a scholarly, pursuit, essentially personal in nature, but one that could occasionally, but somewhat unpredictably, yield results of great practical importance." We live in an epoch where most human activities are the subject of so-called research, and where every branch of science, and not least the biomedical sciences, throws up an un-ending stream of problems, which cannot be solved by armchair pipe-dreaming but demand diligent investigation and study. In the field of the biological sciences, there have been a number of fundamental discoveries in recent years, but so far we have only scratched the surface, as it were and many of the secrets of life and its processes —physiological, pathological, psychological—still remain to be disclosed.

All the same, it is necessary, in medical schools everywhere and particularly in developing countries, to keep a proper balance between patient care, teaching, and research. But in this connection a glance at the title pages of the medical journals is not altogether reassuring. One is tempted to ask what is the expectation of effective life of the majority of the discoveries revealed in these periodicals.

Spirit of Discovery Needed

Research should be the ardent spirit of discovery in full flight. Sometimes it appears to be a routine and even pedestrian activity not only of men and women who are genuinely seeking the advancement of knowledge but also of less inspired persons with different motivations.

In the public health field there is undoubtedly a need for epidemiological inquiries of all kinds, for research into the operation of health services, and for the evaluation of programmes, procedures, and techniques.

But all too often the outcome of these inquiries is no more than an empty "verification of the obvious" which may pacify rather than satisfy the administrator.

One can also legitimately wonder whether the activities of those individuals who calculate that there were 5,000 million cases of gastro-enteritis in the world in 1969 would not be better employed in exercising their undoubted talents on problems of greater substance.

And, finally, let us never forget the realistic comment of Dr M.G. Candau that the identification of a human need is no indication that research is possible.

In the process of development education is of strategic importance, and according to the Report of the Pearson Commission on International Development there has been "a rapid growth of enrolment in primary schools (in developing countries) from 57 million to 137 million between 1950 and 1965". Concomitantly, there has been an increase in the education share of national budgets, which now amounts on the average to 16 per cent. (Incidentally this is a larger proportion than is commonly allotted to health.)

Increases in primary education create a chain reaction in the form of larger demands for secondary and ultimately university education. And this is one of the burdens which the governments of developping countries have still, in great part, to face.

Medicine has benefited and will continue to benefit from these educational trends. They should provide in due course the requisite complement of secondary school graduates to meet progressively the demands of the several professions which service medicine in all its modern complexity. It is also an encouraging fact that between 1958 and 1969, 152 new medical schools were established, the great majority of them in developing countries.

Nevertheless, additional medical schools and kindred training institutions for the other professions are only a partial contribution to the solution of the educational needs and escalating manpower problems of the developing countries. One residual feature of the colonial influence in many of these countries is the tendency for their universities to reproduce the characteristics, both good and bad, of the curricula of the medical schools of the Western world. And this at a time when in those advanced countries there is an active ferment for revision and re-orientation of the medical curriculum, for the introduction of new teaching methods, and for increased emphasis on the preventive and social aspects of medicine.

It is only comparatively recently that a mumber of medical schools in developing countries have begun to appreciate the vital importance of evolving their own curricula and of training their undergraduate students against the background of tradition, local social conditions, and the prevailing indigenous diseases.

Adaptation Process

Considerable progress has already been made in the adaptation process in many developing countries, but the wisdom of this trend has not always been appreciated elsewhere. In one advanced country where the local medical curriculum was being drastically revised it was suggested by the revising body with rather less than its customary tact that the universities in developing countries should concentrate largely on postgraduate medical education and that "the case for undergraduate education in the student's own country is less strong". This, I would suggest, is a rather dubious and dangerous doctrine.

There is another great problem which concerns developed and developing countries alike—the need to train the various types of auxiliary—some professional, others with multiple or even single skills—who make-up the modern medical team both in the hospital and in the field. In developed countries the need arises from the increased complexity of medicine and the heavy demands for the skilled personnel required by advanced medical and surgical techniques. In developing countries, it reflects the stark fact that for many years to come the fully trained medical practitioner and other co-operating professionals such as nurses, dentists, and engineers will be in very short supply. If an effective attempt is to be made to provide some form of medical care to 100 per cent of the population, and this is undoubtedly the ultimate objective, the professionals must be spread very thin indeed, and in addition there must be the most carefully organized use of their time, energies, and skills.

This can be done only through the extensive use of auxiliaries at various levels of education and ex-

pertise. Unfortunately there still survives in some developing countries and idea that the employment of auxiliaries is a stigma of inferiority, and that "only physicians can evaluate and treat the sick". According to a recent study by a Rockefeller Foundation team, *Health and the Developing World* "this conflict arises from the near mystical quality that history and culture have given to the relationship between the physician and his patient".

The fixation may continue for some time yet, but the available evidence suggests that it is weakening, and that the auxiliary is increasingly regarded as the foundation upon which health and medical care in developing countries can be most effectively established. Furthermore, the training of auxiliaries, simple and *ad hoc* though it may be, is receiving particular attention.

The growing recognition of the importance of the health team is seen in the pioneering attempts to obtain the conjoined and contemporaneous education and training of some of its members. The recently established University Centre for Health Sciences at Yaounde in Cameroon where doctors, dentists, nurses, and midwives participate in the same courses of instruction and together climb up the educational ladder to their appropriate level, is an example of the constructive thought and practical experimentation which characterize the educational activities of many developing countries. It is an experiment which will undoubtedly be repeated.

National Health Services

When we come to review the concept of health in greater depth, we encounter the intriguing paradox that the great majority of national health services are wrongly named. I remember being present at a meeting where the then young British National Health Service was being described to a number of foreign visitors. At question time, an interested and distinguished Frenchman—rather like the open-eyed child in the fairy story who discovered that his prince was parading publicly without any clothes asked for the floor, and told us bluntly: "What you have created is not a health service, but a disease service". And this dramatic statement, though not entirely fair, was difficult to rebut. Very few national health services are really concerned with the promotion of health, except from the negative angle of the prevention of disease, malnutrition and disability. It is, of course, a matter of record that ideas of "positive health" or "supplemental health" were widely ventilated some years ago but now appear slightly ridiculous.

Happily in recent years and in certain countries the related questions of physical fitness and sport have come to the forefront and received sympathetic attention. At the moment they have a relatively low priority in developing countries, and even in developed countries there are some hesitations. At a recent symposium on the subject. "The Meaning of Physical Fitness", the question of disease could not be excluded, for the greater part of one session was devoted to "Physical Activity and Coronary disease." The chairman, however, himself the first human being to run a mile in less than four minutes, was aware of WHO's definition of health, and also of some of Galen's aphorisms. He cleverly married them in his own definition which equated fitness and health in these words : "Fitness is a state of mental and physical harmony, which enables someone to carry on his occupation to the best of his ability and with the greatest happiness".

It would be possible to speak at length of that necessary evil, sovereign government, but for our purpose only two or three recognizable trends call for mention or comment. First, there is the increasing tendency to regionalize geographically or to organize functionally some aspects of government which is found in both advanced and developing countries. The reasons for doing so are various. Ethnic causes may operate in some cases : the difficulties of vast areas and distances, and even the need to break up a massive accumulation of population may constitute other valid reasons. And on the other hand there is the movement towards massive, integrated centralization to which I shall refer later.

Concept of Planning

There is next the question of central planning for social and economic development, which has become a major preoccupation of governments during the past two decades. It is said that at least 100 governments have prepared such plans including a health sector component. In the past, planning has

been carried out mainly by economists, with the casual assistance of agriculturists, educationists, public health practitioners, and the representatives of other sectoral interests.

Gunnar Myrdal in his recent book *Asian Drama* is critical of those planners "who have excluded education and health from positions of importance in the planning philosophy". He suggests that the relatively low priority given to these sectors "is traceable to philosophy of development that has stressed the over-riding importance of investment in the physical elements of national growth, such as roads, dams, harbours and factories". Plans have been dominated "by theories based on an uncritical application of western concepts and analytical models" and have been influenced by the assumption that "non-economic" factors—including health and education — can be disregarded. Myrdal belives that rationally the health problem must be integrated with the general problem of planning for development.

The Pearson Commission, in its Report on International Development, has also drawn attention to some recent and helpful developments as follows : "The whole concept of planning has gradually changed in the direction of indicative prescription rather than quantitative production targets. It involves systematic analysis of resources required, establishment of priorities, and a careful assessment of projects".

In other words, planning is being simplified and the practice of designating unrealistic and over-optimistic targets is being abandoned. In no sector is this pragmatic approach more necessary than in the health field, for so far, despite their number and elaboration, the majority of health plans in developing countries have still to be implemented.

Finally in this list of general comments there is the question of resources.

Normally the resources of a government should and do determine its expenditure, and it is for the government to decide how these resources are allocated to the several official sectors. In industrialized countries, a varying proportion of the health expenditure may be carried by the private sector, but with the increasing cost of medical care a larger share is tending to fall upon the national budget.

In developing countries with certain exceptions, the private sector is usually small, and the national budget is in consequence relatively heavily involved.

But a more important differentiating factor is the amount which governments in the two groups are able to spend annually on health services per head of population. In 1966, out of 24 industrialized countries, 16 were spending more than US $ 20 per head. Amongst 85 developing countries, 46 were spending less than $5 per head, and for 14 out of this 46 the expenditure on health was $2 or less. There are in fact developing countries where not more than $1 per head is available, while in some developed countries the expenditure exceeds $70.

This comparison may be stark, even violent, but it is a true representation of the gross disparities which exist and which are likely to be accentuated in the future.

Let us turn from this sombre picture to two other matters which concern not central government itself but the administration of the health services within the government. It is frequently hinted that to some extent the relative failure of the health services to make themselves felt within the government hierarchy is due to the junior status of health ministers. There is an element of truth in the suggestion, for, almost universally, governmental health departments have long played the role of Cinderella. The task of running a health service is never glamorous, and its cost rankles with the economists and lawyers who tend to hold the senior posts in governments. Fortunately there are some signs that the value of health as a contributor to national economic welfare is at last being appreciated, but there is still need for a better understanding of the boons and benefits accruing from effective health services. With an improved image of the health services the post of Minister of Health should acquire greater prestige and influence.

Finally, I feel it imperative to draw attention to the related question of the cost of health services and their control. There is a tendency, hardly discernible as yet, for the financial departments within some governments—not limited to those of developing countries—to seek to control, the scope and operation of health services, not directly, but obliquely through the unfortunate Ministry of Health.

This is particularly true where the national health service is almost entirely supported by government funds and where there is no substantial private sector to supplement or compete with it. Control and direction, emanating from the centre and passing out to the far periphery, can ultimately result in a rigidity of operation which may act to the detriment of the patient and can result in the complete frustration of the professional personnel, who are the *primum mobile* of the service.

Population Problem

I have deliberately refrained so far from introducing "Population" into the long list of challenges and perplexities which assail governments. Ten years ago the urgency of the population problem had not been seriously grasped in the majority of affected countries. Today there are both appreciation and action. Nevertheless, it is not an easy matter for governments to reverse population trends. Yet there are many laymen who are under the impression that the discovery of reliable methods of contraception and the availability of funds provide the immediate and complete solution to the problem. They overlook the need for public education and acceptance, for organization, and for the close association of family planning with the maternal and child health services. In all fairness one must assume that governments are more aware of the inherent problems than the laymen mentioned and are not expecting miracles either now or in the future. At any rate, their estimates for future expenditure on health services generally take account of the built-in factor of annual natural increase, but do so with increasing difficulty.

At this particular and important juncture, where my lecture changes direction, I would remind you of the saying of a reverend Scottish pastor of the old school. Faced with the necessity of explaining an abstruse point of religious doctrine he said, "We come now, brethren, to a very considerable difficulty. Let us look at it squarely in the face—and pass on". This *we* cannot do, for the facts of the human situation in both advanced and developing countries are all too clear and cannot be shirked.

As René Dubos has well said : "Arcadias are dreams of an imaginary past and Utopias the intellectual concepts of an idealized society. Both imply a static view of the world, which is incompatible with reality for the human condition has always been to move on". We are not looking for Arcadias or Utopias, but the need to find some quick and practical solutions to these world problems is urgent.

Second Development Decade

Only I January, 1971, the curtain will rise on the Second United Nations Development Decade. For nearly two years the strategy for the Decade has been in preparation by two important committees of the United Nations, with which all the specialized agencies have co-operated. Though great progress has been made, many doubts and difficulties have beset these preparatory bodies. A negativist air has pervaded the whole proceedings, which, if the Second Development Decade is to succeed, must be replaced by series of positive actions on the part of the governments of both developing and developed countries. There must also be recognizable and demonstrable faith in the future.

For, if the Second Development Decade were to fail, or even to fall seriously short of expectations, the greater part of the 2,000 million inhabitants of the developing world would be worse off than before. Only a small number of developing countries will have reached the stage of economic and social take-off which will guarantee their future; many will be running faster to keep in the same place, but the majority will revert slowly to a state of apathetic misery. Resources will fail. Every favourable prospect will be dimmed. The old pestilences will return. Population control will be achieved effortlessly, not by organized methods but by disease.

How, then, can the governments of both developing and developed countries be rallied to prevent these untoward events ?

Obviously each developing country will have its own particular problems, and must evolve its own way of dealing with them—either alone or with assistance. There is no common pattern of relief or rescue.

There are, however, some broadly agreed principles for action, which differ for the two groups of countries—developing and developed—but are nevertheless intended to be reciprocal. For the developing countries, they include such matters

as the introduction of certain institutional and administrative reforms, the mobilization of domestic financial resources, the expansion of agriculture and industry, the application of science and technology, and a greater reliance on the United Nations and the specialized agencies.

The schedule for the advanced or donor countries is different but nevertheless complementary. It is based on the liberalization of trade increased financial and technical assistance, including the allocation of a minimum of one per cent of their gross national product to assist the developing countries, the alleviation of burdensome debts, co-operation in the transfer of science and technology, and increased support of the United Nations system.

General Principles

These are general principles for action from which the developing countries as a group will benefit nationally and which will catalyse the more specialized activities in the sectoral field.

In the health field, these more specific requisites will include :

- extension of basic health services to 100 per cent of the population even though the operating network is attenuated.
- the replacement of comprehensive health plans complete with time tables and quantitative targets by indicative plans giving alternative priorities which can be modified according to the funds available.
- improved sectoral education for all health workers, better use of professional personnel, and an increased utilization of auxiliaries.
- control of urbanization.
- increased allocation of funds to the health sector.

To some extent, this is the prescription as before but the urgency of the situation demands a more dynamic attack. Moreover, success will also depend on the form and quantity of the assistance provided by the industrialized countries.

In addition to their fundamental obligation to provide more financial support, there are a number of supplementary measures which, if adopted and applied by the governments of developed countries, can materially assist the Third World. They can be outlined as follows :

- To begin with, a more intimate knowledge of the needs of individual developing countries deligently acquired by local residence, consultation, and study. This should prevent industrialized countries from giving irrelevant and useless forms of assistance and enhance mutual understanding and confidence.
- Increased assistance in education and training, taking into account the local environment, traditions, customs, and prevailing diseases.
- The provision of volunteers.
- The acceptance of a self-denying ordinance with regard to employment of health service personnel from developing countries with manpower shortages. The expansion of the local national health services can be regarded only as an excuse and not as a justification.

These are not simple prescriptions suitable for automation. They involve intensive and continued action after careful thought and planning. They will call for self-sacrifice and a dedication of effort and resources on the part of the governments and peoples of developing countries. They will require real self-denial on the part of industrialized countries in ways they have not foreseen. They will be helped everywhere if increased public participation and support are forthcoming.

Success is not inevitable and may be elusive partial, or sporadic. But with success something of outstanding value will have been added to the quality of life in developing countries, and in the industrialized world there should be at least a feeling of merit acquired by disinterested action.

The seventies can be the forerunner, not of a Utopia but of an era of world-wide civilized peace and prosperity—but only if mankind wills it. Jacques Parisot, at any rate, would have had no hesitation in yoking medicine and government, his own country, and the whole gamut of the United Nations to this enormous and imperative task. —*WHO Chronicle*

ON FAMILY PLANNING

INVOLVEMENT OF MEDICAL PRACTITIONERS IN F.P.

SHRI K.K. DASS, Union Secretary for Health and Family Planning, told the Northern Zone Conference of Family Planning in New Delhi on 29 January, 1971 that the performance in Uttar Pradesh in the field of family planning has started showing an upward trend following the appropriate delegation of financial powers to the State Department of Health. This experiment could be extended to other States also where non-delegation was proving a hinderance. Shri Dass indicated that the Ministry would be taking up the question with the Chief Ministers and Chief Secretaries concerned.

Referring to the subject of training which had been under discussion during the 4-day Conference, Secretary expressed the view that the training must continue to receive adequate attention. He, however, added that the need for training existed at all levels. In fact the trainers must be trained first. Good training, he added, could correct even faulty selection of staff to a great extent.

Regarding the present method of selection of the staff for family planning, the Secretary said that seniority should not be the only criterion. Merit and special training must be taken into account. Those who proved unequal to the task could be replaced by better ones while all those who did well should be recognized through incentives and permanancy, wherever feasible. Shri Dass told the family planners that the concept of integration of maternity and child welfare with the family planning should fully reflect itself in our programmes. The services must be very good to sell the idea and we should not keep only the eligible couples in mind but the entire family should be approached as a unit where the well-being of the child and the mother and sanitation were fully taken care of.

The Union Health Secretary revealed that at a recent selection of doctors for a higher post it was discovered that some of them did not know even the rate of population growth. Such lack of knowledge, he thought, was one of the main reasons of the present indifference and non-involvement of the doctors in the movement. The need to educate the doctors to secure their involvement was indeed great. Concluding, the Health Secretary expressed the opinion that the mass media had not yet been utilized to the optimum. Some re-thinking on the entire approach seemed necessary and he had asked the Department to undertake such a review in respect of mass media and extension services.

Representatives from Haryana, Punjab, Rajasthan, Uttar Pradesh, Jammu & Kashmir, Himachal Pradesh and Delhi participated in the Conference.

TRAINING OF DAIS FOR F.P.

THE Family Planning Department of the Union Ministry of Health and Family Planning has drawn up a rupees 50 lakh scheme for deeper involvement of *dais* in the Family Planning and Maternity Child Health programme by giving them an intensive 30-day training in the Maternity Child Health and Family Planning services. This integrated training will cover both the theoretical and practical aspects of their work.

In order not to cause dislocation in their professional work and to facilitate their participation in their professional work, they have been allowed to attend the training classes once a week. The 30-day training has, accordingly, been spread over a period of about six months.

During the training, each *dai* will be paid a stipend of rupees two for every day she attends the course. The stipend will enable her to meet out-of-pocket expenses on bus fare, mid-day meals, etc.

After the completion of the training, the *dais* will be entitled to payment of rupees two per delivery conducted by them. This will cover registration of the case with the Auxiliary Nurse Midwife, pre-natal attendance, delivery and cost of cotton, soap and antiseptic drugs, etc. If the case is not registered with the Auxiliary Nurse Midwife, the *dais* will be entitled only to rupee one per case.

It will be recalled that earlier the *dais* were paid only rupee one per day for attending the training course. The response was poor as the stipend hardly covered their out-of-pocket expenses. The

(*Contd. on page 179*)

Around the states

ANDHRA PRADESH

Pesticide Residues in Foodstuffs

THE use of toxic agricultural chemicals for plant protection has increased considerably during the past decade. It is now an accepted practice to use these chemicals to increase the yield per hectare and also to produce insect and disease-free products.

The most important problem posed by the widespread use of these toxic chemicals is the presence of residues in the crops at the time of harvest. Of the two types of chemicals widely used in agriculture in our country, the organochlorine compounds are more persistent as compared to the organophosphorous compounds. To find out the extent and type of organochlorine residuesin various foodstuffs, work in screening such samples has been initiated at the Central Plant Protection Training Institute, Hyderabad.

The problem of residues has to be examined in a little more detail. At the outset one has to recognize that there is no alternative for the use of these chemicals in agriculture. They are toxic and residues present in the harvested crop may pose some hazard to the consumer. Further the organochlorine insecticides are fat soluble and when ingested are stored in the fat depots of the animal. Such stored compounds are excreted in the milk.

By actual experiment it has been shown that residues when present below the so called 'tolerance limits' are not hazardous to the consumer. It should therefore be our endeavour to use these chemicals in such a way that there are no residues or if present they are below the 'tolerance limits'. To achieve this objective it is necessary to determine the proper dose, frequency of application, type of formulation and finally the time interval which has to elapse before the crop can be harvested for consumption.

In India, the 'tolerance limits' have not been prescribed yet. Before doing so, it is necessary to find out the extent and nature of residues present in some of the most common foods. This information would show the percentage of samples which have residues beyond the generally accepted 'tolerance limits' and also whether the pesticides are being used with adequate precautions. When sufficient information has been gathered it would be possible to get a proper picture of the situation in relation to the use of pesticides in our country. Such work is in progress at the Central Plant Protection Training Institute. The results obtained so far indicate that there is widespread usage of insecticides and in several cases improper application has resulted in harmful levels of these chemicals being present in foodstuffs. —*From V. Lakshminarayana* and *K.K. Nirula*, Central Plant Protection Training Institute, Hyderabad-30.

HARYANA

Immunization Camp at Safidon

AN immunization camp was organized at Primary Health Centre, Safidon, 21 miles from Jind in Haryana. Shri K.R. Punia, IAS, Deputy Commissioner, Jind stressed the importance and implementation of the immunization programme for the welfare of the people.

More than 2,000 children were given triple vaccine doses with a special jet gun against a target of 1,500 children. There were 80 pregnant mothers in Safidon town, out of whom 60 got tetanus toxide injection.

Dr Kuldip Sethi, Chief Medical Officer, Jind said that the apprehension from the minds of eligible couples about the safety of their children could be removed if three triple vaccine injections were given to the children under the age of six. Dr Sethi told the audience that their children would be protected against the attack of whooping cough, diphtheria and tetanus by the administration of the triple vaccine. He further explained that the pregnant mothers could also be saved from tetanus by administering tetanus toxide injection. This injection would also prevent tetanus in new borns, Dr Sethi said.

Dr S. Shah, Assistant Director, Health Services assured the audience that full facilities have already been made in all the hospitals.

TAMIL NADU

Neurologist-Meet on Brain Diseases

NEUROLOGISTS and neurosurgeons from different parts of India and abroad met in Madras on 15 December, 1970 to discuss the latest trends

in the treatment of diseases of the brain and the central nervous system. The occasion was the celebration of the 20th anniversary of the Institute of Neurology, Madras.

It was on 24 October, 1950 that the Neurosurgical Department started functioning in the Government General Hospital, Madras. The then Madras Government was the first State Government in India to open a separate neurosurgical unit in its leading hospital.

The Department of Neurology and Neurosurgery of the Madras Medical College and the Government General Hospital, has now developed into a full-fledged Institute of Neurology with post-graduate teaching and research facilities.

The Institute has all the latest diagnostic and operative facilities. On the ground floor is the "Craniotome", an instrument for taking X-rays of the skull. The "Tomogram" of the attachment provided on the machine enables the extent of penetration of X-rays to be adjusted to the depth desired. It facilitates taking of X-ray pictures of different cross-sections of the skull.

On the first floor, electro-medical instrument are maintained. The electro-encephalograph, which records electrical activity of the brain, is employed to study epileptic discharges of patients. The electro-myograph is used for diagnosing diseases of the muscles, peripheral nerves and the spinal cord.

The Institute of Neurology is also equipped with an X-ray image intensifier and closed circuit television. This arrangement helps to reduce the amount of radiation.

The type of organized head injury service available in this institution is said to be unique as none of the other 22 neurosurgical centres in India provide such a facility.

On the first floor the clinical psychology section is housed. Under the research scheme on epilepsy the department has treated over 11,500 cases of which 1,679 have been taken up for detailed analysis.

By the side of the radiology section and also adjacent to the operating theatre is a room for special electro-encephalograph studies during operations. Such studies are particularly valuable during depth surgery of the brain called "stereotaxic surgery".

The enormous patient load, the poor general condition of the patients, the inadequate nursing facilities for serious cases and house surgeons being prohibited from assisting neurosurgeons are some of the handicaps facing the specialists. Despite personal difficulties a devoted team of doctors, nurses secretarial and other staff have given of their best to the department.

DELHI

Therapeutic Value of Yoga

THE therapeutic value of yoga should be established on scientific basis to motivate people to take advantage of this ancient system, said Shri K.K. Shah, Minister of Health and Family Planning. Shri Shah was inaugurating a 40-day camp at New Delhi on 12 February, 1971 for treatment of diabetes which is being run by the yoga hospital of Vishwayatan Yogashram.

Shri Shah praised this hospital for utilizing modern laboratory facilities for assessing chemical and biological changes caused by various yoga 'asans'.

Later, thanking the guests, Shri I.K. Gujral, Minister of State for Works, Housing and Urban Development expressed the hope that the hospital would bring better health to many patients suffering from incurable and chronic diseases.

Facilities for Doctors in Difficult Areas

THE Union Ministry of Health and Family Planning has decided to give a special pay of Rs 150 p.m. to doctors posted in distant and disadvantaged area blocks. The blocks in these areas, numbering about 400, will be decided by the Central Government in consultation with the State Governments concerned. The special pay will also be admissible to Central Health Services doctors posted in similar difficult areas.

The Government has further approved the provision of some basic facilities like electricity, approach road and water supply at 100 blocks at a cost not exceeding rupees sixty thousand per block in these disadvantaged areas. The scheme is designed to attract a larger number of doctors to work in remote areas where they have been reluctant to go for want of some essential amenities and because of special difficulties faced there. It forms part of a number of

schemes formulated by the Government of India to provide adequate health and family planning services in remote and difficult areas in the country.

Noise Pollution and Health

THE problem of noise pollution could be tackled partly by legislation and partly by persuasion. Dampening the source noise level, replacing the noise source with quieter machine and adjusting the operating hours were some of the possible solution for control and abatement of noise. This was stated by Prof. P.N. Wahi, Director-General, Indian Council of Medical Research, while delivering the main address at the scientific session of the symposium on 'Noise Pollution and Health' held at New Delhi on 19 March 1971. The seminar had been organized jointly by the All-India Institute of Medical Sciences and National Physical Laboratory, New Delhi.

Scientists from All India Institute of Medical Sciences, National Physical Laboratory, Indian Institute of Technology, Defence Institute of Physiology and Applied Sciences, Indian Air Force, Indian Navy and Armed Forces participated in this seminar. Besides, accoustical engineers, architects, lawyers and other scientists also attended the symposium.

The experts among other subjects discussed (*i*) Noise—its nature and implications, (*ii*) Noise levels in the urban community, (*iii*) Noise—as viewed by the industrial management, (*iv*) Traffic noise in Delhi, and (*v*) Psychological effects of noise.

Prof. Wahi referred to the invention of a new motor engine—the wankel rotary engine which might give an effective solution to the problem of noise pollution by motor vehicles. He also suggested that research should be carried out on community noise level in urbanizing areas to help metropolitan authorities in their development planning; physiological and psychological effects of noise, and large scale studies of ethnic groups not exposed to noise of civilization to help to know the degree of hearing loss attributable to social and occupational causes.

Inaugurating the symposium, Dr V.T.H. Gunaratne, Director, World Health Organization (SEARO) asked the Health administrators to consider whether there was need for legislation for checking hazards from noise and noiseness. He said persuasion and education would be more effective and suggested that potential cost of the noise should be estimated. □

ON FAMILY PLANNING (*Contd. from page* 176)

Conference of the Health Secretaries and State Family Planning Officers held in Delhi in September, 1969 had recommended an upward revision of the rate of the stipend to attract a larger number of *dais*.

MORNING-AFTER PILL FOR F. P.

SHRI K.K. DASS, Secretary, Union Ministry of Health and Family Planning said that the inauguration of the Mobile Hospital Scheme will give a new fillip to the intensification of family planning programmes in the rural areas. The mobile hospitals will not only be providing medical and health care but will also offer family planning services.

Shri Dass was addressing the trainees of the International Institute of Population Studies, Bombay, currently on a tour of the capital at New Delhi on 22 February, 1971. The trainees include students from Ceylon, Thailand, Indonesia, South Korea, Iran, Hong Kong and Taiwan.

Referring to some other developments, the Union Health Secretary said that the experiment on the "Morning-after pill" conducted in Lucknow showed great promise. The experiment had already been tested successfully on animals without any side effects. It was claimed that because of the non-harmonal ingredience the pill was not likely to have any ill effects on human beings.

Shri Dass reiterated that the family planning programme will continue to be integrated with the health programmes. In fact, he felt, that there was need for greater integration to secure better results.

SHARP INCREASE IN NIRODH SALES

THE sale of Nirodh in the country registered a rise of 116 per cent in December 1970 over last year's figure during the month. The consolidated figures for the country reveal that 4.60 million pieces of Nirodh were sold.

Cumulatively sales of Nirodh during April-December 1970 recorded an increase of 78.4 per cent as compared to figure for the corresponding period in 1969.

The normal commercial channels, through which Nirodh is marketed, have reported that there is definite improvement in Nirodh sales and it is getting popular. □

BOOK REVIEW

Condensed Report : Mass Education and Information Officers' Training Programme. Compiled by : D. Lakshminarayan, M. L. Mehta and edited by T.K. Parthasarathy, Central Health Education Bureau, Kotla Road, New Delhi, (mimeographed) pp. 142.

A communicator is a link between the scientist and the layman. The scientist advances knowledge; the communicator advances progress. On the latter's professional competence depends the potential for the millions of people to overcome ignorance, poverty and disease and to attain a state of social well-being. But where are such communicators who can translate the message into the language of the people ?

The Central Health Education Bureau (CHEB), to help meet such a need organized a training programme for the Mass Education and Information Officers (MEIOs) to improve their communication skills. Much misunderstanding results from faulty communication. Too many people saying wrong things at the wrong time, in the wrong way to the wrong people shows slow progress. What is needed is more people saying the right thing, at the right time, in the right way, to the right people. This is the formula of good communication. The CHEB has tried to adhere to this formula in its training programme for the MEIOs, keeping in view their respective job responsibilities.

This condensed report is a basic step towards supplementing the knowledge gained by the personnel during the training course. It contains fundamental concepts, principles, methods, techniques and procedures which are essential in 'transfering' useful ideas from one person to another.

Based on the lectures delivered by knowledgeable persons in the fields of family planning, extension education and mass communication, the report is a 'must' for all dedicated to the task of carrying the message of the scientists and the administrators to the common man.

The presentation by Shri M.G. Kamath, gives biblical tips on simple writing. The article in simple words and short sentences, will serve as a guide for popular writing. It is said that one picture is equal to 10,000 words. And Shri T. Kasi Nath tells a lot about picture selection and use.

The report contains 27 articles, and each is better in its own way. The report provides wide coverage on everything about information tools. Glossary of technical terms, proof reading symbols, and bibliographies on different topics will be useful. And this may be considered for addition if and when a next edition is planned.

I. J. D.

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For the National Malaria Eradication Programme, a six-week intensive specialized course on the microscopic diagnosis of malaria is conducted in the six regional coordinating organizations at the national level. There is an annual intake of about 400 students. Seats available for the one-year certificate course in some States like Uttar Pradesh are filled in by laboratory technicians working in the N.M.E.P. or by those working in maintenance phase of the N.M.E.P.

By the end of 1969-70, there were about 5,000 laboratory technicians available in the whole of the country as against the estimated requirement of about 25,000. To make up for the existing shortage and to meet the additional needs of developing health programmes, it is estimated that training facilities for about 20,000 laboratory personnel are required. To meet this huge shortage, it is necessary to establish additional training centres in all States, in every medical college, medical research institute, State Laboratories, Regional Health Laboratories and hospitals.

(*b*) *Diploma and Degree Courses*—Two medical laboratory technology schools have been established with WHO assistance one at Trivandrum Medical College and the other at the Post-graduate Institute of Medical Education and Research, Chandigarh to prepare well-qualified laboratory technicians to serve as instructors in the State Training Schools for laboratory technicians and to work in referral health laboratories, sepcialized laboratories, etc. A two-year course leading to B.Sc. degree is being conducted at Chandigarh School and a similar course is being organized at Trivandrum also. Further, a three-year M.Sc. degree course has been started from 1970 at Chandigarh. The West Bengal Government is running a Diploma course for science graduates in laboratory techniques. The States of Maharashtra and Tamil Nadu also propose to establish graduate courses for technicians.

Post-Graduate Training of Medical/Non-Medical Graduates

Training of medical graduates and non-medical microbiologists with post-graduate qualifications, are undertaken in the various fields of specialization, *viz.*, Pathology, Bacteriology, Biochemistry Haematology, etc., in some of the medical institutions. This will help to have staff for higher posts such as consultants in laboratory technology.

Organizational Problems

Health being a State subject, planning and projection with regard to health laboratory services are taken up according to the needs of the area, the financial allocation and availability of medical resources. Hence uniformity in the pattern of development of laboratory services is lacking. While diagnostic services in the urban areas are more or less well-developed and are served by the medical colleges and hospitals, similar services at district/rural levels are grossly inadequate.

As it stands today the laboratory services are yet to acquire recognition and esteem, without which, referral system may find it difficult to grow according to the needs.

The medical officers-in-charge of the programme should be adequately trained and their status recognized commensurate with the important nature of work which they have to carry out. If the services are to develop properly only those technicians who possess basic qualifications on the subject should be entertained for laboratory work but there is huge shortage of laboratory technicians in the country and to meet this situation, additional centres for training will have to be established in all States in their existing medical colleges, medical research institutes, State laboratories, regional health laboratories, hospitals, etc., where adequate and proper facilities and trained staff can be arranged for their requisite training.

The data collected in the laboratories during routine work are invariably utilized only towards immediate help in the treatment of patients. Proper analysis of the data should, however, yield sufficient material for assessment of health problems. □

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