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HEALTH

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Origin and Constitution of the Health Organisation. I. The Epidemiological Intelligence Service; the Information Centre at Geneva; the Eastern Bureau at Singapore; Morbidity and Mortality Statistics. II. The Educational Work of the Health Organisation; Publications; Study Tours, Instruction. III. Technical Work in the Various Branches of Preventive Medicine; Malaria; Sleeping-sickness; Tuberculosis; Cancer; Smallpox; Leprosy; Rabies; Infant Mortality—Standardisation of Sera—Co-operation between the Health Organisation and National Health Authorities.

INTRODUCTION

THE charter of the Health Organisation is contained in the Covenant of the League, *Origin and First Tasks.* Article 23 of which provides that States Members of the League “will endeavour to take steps in matters of international concern for the prevention and control of disease.”

As long ago as its second session (February 1920), the Council decided to summon an International Conference of Health Experts to draw up a scheme for the Organisation.

This Conference, which met in April of the same year, was at once faced with the grave problems raised by the epidemics of typhus, relapsing fever and cholera, which had spread from Russia to the countries of Eastern Europe. Urgent measures were taken, and the Conference recommended the establishment of a temporary Epidemics Commission, which the Council decided to set up.

This Commission co-ordinated the efforts *Epidemics Commission.* made to deal with the epidemics in Poland, Russia and the Baltic States; and assisted the national authorities by placing at their disposal specialists, hospital and medical supplies, and in some cases clothing and food.

Anti-epidemic measures and the organisation of a sanitary cordon became still more necessary after the Russo-Polish war,

when hundreds of thousands of refugees who had been driven into Central Russia and Siberia during 1915 and 1916 by the Russian armies in retreat returned to Poland and the Baltic countries; the requisite health measures and the transport and settlement of these refugees imposed a heavy burden on the countries of Eastern Europe.

At the request of Poland, an International Health Conference met at Warsaw in March 1922 under the auspices of the League. Twenty-seven European countries attended, and although the funds available for the measures proposed by the Conference were not sufficient for the full programme to be carried out, closer co-operation resulted between the Russian and Polish authorities, special courses were organised for training the personnel engaged in the anti-epidemic campaign, and sanitary conventions were concluded between the countries of Eastern Europe. By these measures, Central Europe was saved from infection.

The Epidemics Commission was also active in Greece during the autumn of 1922, when more than 750,000 refugees from Asia Minor were driven into that country by the advance of the Turkish troops; smallpox, cholera and typhoid fever were raging among them. A vaccination campaign was organised with the help of eighty Greek doctors and health inspectors, and 550,000 refugees were treated.

While the Epidemics Commission was carrying out these urgent tasks, a provisional Health Committee was set up at Geneva. The scheme for the Organisation drawn up in May 1923 by the members of that Committee and the delegates of the Comité permanent de l'Office international d'Hygiène publique was adopted by the Fourth Assembly (September 1923).

The Health Organisation consists of a *Health Constitution Committee*, comprising some twenty members, and meeting twice a year; an *Advisory Council of the Health Organisation*, appointed by the Comité permanent de l'Office international d'Hygiène publique; and the *Health Section*, the executive organ, which is an integral part of the League Secretariat.

The members of the Health Committee are medical specialists or officials in charge of public health services. They are selected for their technical qualifications, belong to various countries in Europe, Latin America and the Far East, and do not represent their Governments. Their scientific discussions are

not hampered by any political considerations, and some of them belong to countries which are not Members of the League (one being the head of the Federal Health Service of the United States). The Health Committee and Health Organisation are non-political bodies.

The Committee's duty is to lay down the programme of work for the Health Section and to give expert advice on technical questions submitted to it by the League Council and Assembly. It is assisted by technical committees or conferences of experts.

The Health Section contains some fifteen public health specialists, epidemiologists and statisticians of various nationalities, and carries out the programme drawn up by the Committee. It collects the information required by the different committees, makes preparations for conferences and study tours and, by correspondence, publications or translations, forms a connecting link between all who are engaged upon research work on the same problems.

Amongst the subsidiary organs of the Health Organisation are the committees of experts, some *Methods of Work.* undertaking research of a documentary and bibliographical nature, some co-ordinating the laboratory work carried out by various institutes, and others pursuing epidemiological or medico-social enquiries by means of study tours or missions.

There are also committees of Government representatives dealing chiefly with matters that require the direct co-operation of the administrative health services, and the Organisation from time to time convenes international conferences for the exhaustive investigation of certain technical questions.

One of the methods most frequently employed for the co-ordination of scientific problems is to summon a committee of experts to draw up a programme. The investigations are then distributed amongst a number of competent scientific institutions, whose directors meet at regular intervals and, if necessary, vary the programme. When they have completed their task, a final meeting is held at which a joint report is prepared embodying their findings.

Some committees carry out enquiries on the spot and go from country to country to compare the methods of applying certain specific health measures. In one case in Central Africa, it was

even found expedient to establish a laboratory for the use of a committee's investigators. As a rule, however, the Health Organisation appoints a single investigator, or one of its members is attached to a scientific mission already constituted by the country concerned.

Despite the great diversity of method employed by the Health Organisation, there are certain guiding principles which govern its activities :

(1) The Organisation confines itself to work of a practical nature and does not undertake any purely speculative research ;

(2) It does not itself deal with practical health problems unless they are international in character, by reason either of the nature and extent of the investigations required, or of the measures necessary to combat epidemics.

The Health Organisation does not depart from these principles unless a Government asks for its technical advice or assistance ; in such an event, it naturally does not stop to consider whether what it is asked to do accords absolutely with the rest of its work.

I. EPIDEMIOLOGICAL INTELLIGENCE SERVICE

Before useful work can be done in the field of health, the relative importance of the diseases to be fought must be ascertained.

This necessity was forcibly demonstrated in the course of the work undertaken by the Epidemics Commission in Poland and Russia : it was found that the efficacy of the prophylactic measures taken along the Russo-Polish sanitary cordon mainly depended on the receipt of prompt and full information on the outbreak and course of epidemics on both sides of the frontier.

The Epidemiological Intelligence Service organised to meet this need was the first instituted at the Geneva Health Section. As far back as 1921, it began to publish reports on the health situation in Eastern Europe, with special reference to typhus, relapsing fever and cholera in Russia and Poland ; with the assistance of the Soviet authorities, it also made a retrospective survey of the health situation in Russia.

These reports were first published periodically in 1922, and included not only Eastern but also Central European, and subsequently all European countries. Gradually, the Service was extended to all infectious diseases which are compulsorily notifiable: smallpox, dysentery, malaria, scarlet fever, diphtheria, etc.

The first *Monthly Epidemiological Report* of the Health Section appeared in July 1923. Since that time, the gradual improvement of the Service has made it possible to obtain and publish the latest information each month, and the *Report* has become of the greatest value to health authorities.

The first *Annual Epidemiological Report* also appeared in 1923. The provisional data included in the *Monthly Reports* are supplemented and checked and then inserted in the *Annual Report*. Originally, the sole object of the Service was to supply prompt information to the authorities of each country on the health situation in neighbouring countries. But the importance of these data from the point of view of epidemiological research was soon realised; it became evident that, if they were co-ordinated, they would enable investigations to be made into the geographical and seasonal distribution of diseases, the influence of climatic conditions, etc.

When the work of co-ordination began, there was difficulty in comparing information from countries with an adequate statistical service with the information from countries where health and demographic statistics were unsatisfactory. The publication of these data showed that, to be made intelligible, they must be supplemented by particulars of the statistical methods in use in the various countries. The considerable amount of work done by the Health Organisation to make national statistical services more efficient and to facilitate the comparison of their results has been based on data thus furnished by the Epidemiological Intelligence Service.

The usefulness of the Service and its immediate success prompted the Japanese member of the *Eastern Epidemiological Intelligence Centre at Singapore.* Health Committee, in 1922, to request the Organisation to examine epidemiological conditions in the Far East and to consider the possibility of establishing in that vast region a centre similar to the one at Geneva.

An enquiry was carried out in 1922-23 by a member of the Epidemics Commission and this led to the establishment of the

Eastern Epidemiological Intelligence Bureau at Singapore. The central position of this port is exceptionally favourable, as it is a port of call for practically the whole of the maritime trade between China and Japan and the Near East, Africa and Europe.

In February 1925, a Conference of the representatives of the Far-Eastern Health Administrations was held in Singapore; it approved the establishment of the Bureau, which began operations a few weeks later.

In Europe, plague and cholera are rare diseases, and in Russia they have only gained ground as a result of war and revolution, but they are always prevalent in an endemic state in certain Eastern countries—*e.g.*, in India and China—and make these regions dangerous sources of contagion to their neighbours. The importation of plague into Java is too recent and the memory of the outbreaks of cholera in Japan is still too vivid for Far-Eastern countries not to attach special importance to quarantine measures. They therefore began to co-operate with the new Bureau as soon as it was established, and supported it by subsidies and by the rapid transmission of the desired information.

As soon as they are informed by the Bureau of the appearance of epidemics in certain ports, Governments can take the necessary measures of protection against vessels coming from those ports; they know too that they can dispense with such measures for shipping from non-infected zones. This has the double advantage of increasing security and of eliminating unnecessary quarantine restrictions on maritime trade.

The services of the Eastern Bureau can only be really effective if they cover the widest possible area. In the great region bounded on the east by Panama, on the north by Vladivostok and on the west by Suez, the Bureau established from the outset weekly telegraphic communication with thirty-five ports, and at the present time it is in contact with one hundred and fifty. The information service now covers all Eastern ports of any importance, with the exception of certain Chinese ports which, owing to political disturbances, cannot yet be regarded as regular correspondents.

The ports inform the Bureau telegraphically each week (or more frequently if necessary) of the number of cases and deaths caused by epidemic diseases. The health administrations notify

it of the imposition or removal of quarantine and, in some instances, of the departure and course of infected vessels. In urgent cases, ports situated near an area in which an epidemic has just broken out are notified by telegram and they are thus enabled to take quarantine measures in time. The information received from all points of the Pacific is included in a bulletin which is telegraphed weekly in a special code to the Geneva centre and to the Eastern health authorities. To reduce the cost and to disseminate the information over a wider area, arrangements have been made to broadcast the weekly bulletin in code and in clear from a number of stations. The authorities in Indo-China, the Netherlands Indies, British India, Madagascar, China, Japan and Germany have been good enough to place their stations at the disposal of the Bureau for this purpose. Since the beginning of 1930, the Bureau, through the station at Malabar (Java), has been able to issue daily information on a wave-length of 600 metres so that the messages can be picked up at sea. The weekly broadcasting of epidemiological information issued by the Eastern Bureau is now ensured by ten stations, and one station broadcasts it daily.

The Bureau also receives information relating to the Southern Pacific archipelagoes from the epidemiological centre of Melbourne, and is informed by the Conseil sanitaire maritime et quarantenaire d'Egypte about health conditions among the pilgrims to Hedjaz—data of great interest to Mohammedan countries.

Since the entry into force of the International Sanitary Convention of 1926, the Bureau has acted officially as intermediary between the health authorities in its zone and the Office international d'Hygiène publique in Paris.

While it is important for the health authorities to be notified of the arrival of an infected vessel, it is equally important that they should know the most effective methods of disinfection and quarantine. The Eastern Bureau collects and distributes information on the health equipment of ports; the Health Organisation has also instituted, for medical officers of health in the Mediterranean, Baltic and Far-Eastern ports, a series of study tours for the inspection of the health and quarantine equipment of those ports, and this has prepared the way

for valuable co-operation between the directors of port health services.

With the same object in view, the Health Committee has set up a Commission of Enquiry into the Fumigation of Ships and has obtained the close co-operation of the United States Federal Health Service.

The Eastern Bureau acts as an intermediary between the health administrations of the countries to which its sphere of action extends. The administrations send representatives each year to the sessions of its Advisory Council, which have been held at Singapore, New Delhi, and Bandoeng (Java), and this affords the delegates regular opportunities of exchanging views.

As the outcome of one of these meetings, the various Eastern health authorities requested the Singapore Bureau to undertake investigations into the efficacy of oral vaccination against cholera and dysentery. Valuable research work was done in British, French and Portuguese India, and in Chosen and Siam. The investigations in the presidency of Madras were of special interest and proved that oral vaccination against cholera is almost as effective as vaccination by subcutaneous injection.

The Eastern Bureau has obtained similar results with the anti-cholera and anti-dysentery bacteriophage and with the dried anti-smallpox vaccine, which, owing to its constancy, is greatly superior to the vaccinal lymph used in tropical countries and on board ship.

The Bureau acts as a co-ordination centre for the investigations into plague, decided upon at a meeting of a committee of experts at Calcutta in December 1927. After distributing the work amongst their various services, the health authorities exchange the results obtained through the Bureau. A further meeting of the committee will be held in 1930.

The Bureau likewise acts as intermediary between a large number of laboratories in the East and Far East for the exchange of experimental animals, bacterial strains, vaccines, etc.

After starting merely as an office for the exchange of epidemiological intelligence, the Bureau has now become in this part of the world, not only a connecting link between health authorities, but also a centre for the co-ordination of scientific research.

*The
International
Standardisation
of Morbidity
and Mortality
Statistics.*

When it came to collect and publish morbidity and mortality statistics, the Geneva Epidemiological Intelligence Service realised that, for purposes of comparison, it was necessary to standardise the methods by which they were compiled, and in February 1924, the Health Committee set up several committees of specialists.

Amongst the points on which these committees have succeeded in obtaining the standardisation of statistics is that of still-births. A large number of Governments have now adopted the same definition of the term "still-birth" and some common rules for the compilation of statistics relating to still-births. This agreement makes it possible to compare the figures furnished by those countries on the birth rate, fertility and infant mortality; the rates are now calculated in relation to the number of *live* births and not to the number of *total* births.

Another committee has drawn up rules for the uniform determination of the cause of death in cases of several concomitant diseases. An example of the absence of rules is the fact that deaths from tuberculosis following on whooping-cough were formerly included by one country in the tuberculosis statistics, and in another in the deaths from whooping-cough.

To promote the standardisation of statistical methods, the Health Committee convened in 1923, 1924 and 1925 meetings of the directors of the demographic services in the principal European countries. In study tours through Switzerland, France, the Netherlands and the three Scandinavian countries, these specialists were able to see for themselves the advantage of certain methods employed and, where necessary or useful, to improve the system in force in their own countries. At the 1925 meeting, they agreed to draw up a number of common rules relating to the registration of the causes of death, and laid special emphasis on the necessity for keeping the particulars entered in the civil register quite separate from the medical data given in the death certificates—thus safeguarding professional secrecy, which is essential if the certificates are to be reliable.

In conjunction with the International Statistical Institute, this Committee of Experts played an important part in preparing for the decennial revision of the International List of Causes of Death (1929).

The standardisation of statistics can sometimes be effected merely by agreement between the specialists in the various countries as to the definition of certain terms, but considerable difficulties are frequently encountered in practice owing to the changes in legislation and custom which this would involve. It must also be remembered that progress in the direction of standardisation is of recent growth and that the principal material at the disposal of investigators consists of documents compiled during the last fifty years according to rules which vary widely in different countries. To enable specialists to employ with a minimum of error old tables published abroad, the Committee of Experts has prepared manuals giving for each country the guiding principles followed in collecting and presenting demographic data; this has made it possible to interpret correctly the statistics of some twenty countries without the necessity for lengthy research in libraries.

The remaining field of activity of the Committee of Expert Statisticians is morbidity statistics. It devoted its attention to the question of the notification of contagious diseases, and in 1922 it organised a study tour; the problem was re-considered later from a different standpoint, when an attempt was made to draw up a list of diseases in relation to the special needs of social insurance. As the lists of causes of death are obviously inadequate for the classification of the numerous and frequently benign causes of incapacity for work, the principal social insurance institutions use empirical lists which in many cases have no proper medical basis and are not of any great value. Considerable information has been collected by the Committee, and it may be possible to draw up a list which will give satisfaction both to insurance and public health services.

Besides furnishing investigators with material *Epidemiological Investigations* for epidemiological investigations, the publications of the Health Section also embody the results of original work; this includes an enquiry into health conditions in the Ukraine, the investigation of the cholera focus at Rostoff-on-the-Don, the epidemiology of cholera in British India and Japan, an enquiry into cerebrospinal meningitis in Prussia, into the morbidity and mortality due to scarlet fever, and more recently an enquiry into health conditions in certain islands of the Southern Pacific. Since 1929, the *Monthly Epidemiological Reports* have included enquiries of this

description and an ample bibliography relating to the most important infectious diseases or those which are of special interest at the moment. These general surveys have dealt successively with diphtheria, smallpox, typhus, scarlet fever, tularemia, infantile paralysis and psittacosis.

II. THE EDUCATIONAL WORK OF THE HEALTH ORGANISATION

It is important for demographic statisticians to know the working methods of similar services in other countries, but it is even more important for hygienists to know how fundamental health problems are dealt with outside their own country. Some methods are not applicable everywhere, but there are many technical processes or administrative rules which have been tested in some countries and can be made use of in others. Hygiene is primarily a matter of education. This principle applies, not to the public only, but to health officials as well.

The Health Committee quickly appreciated the necessity for improving the professional training of technicians. It first of all published *monographs on the organisation and working of the public health services in various European countries*. These pamphlets contain data on the administrative regulations, health legislation and principal health problems of those countries and supply information on the co-operation of private associations with the public health authorities.

Hygiene is a science which is making rapid strides and legislation has to adjust itself to it ; it is therefore important that the information given in these monographs should be kept up to date. With this object, the Health Section publishes the *International Health Year-Book*, from which progress made each year in fighting the principal diseases can be ascertained by a study of the mortality tables and of the new health measures introduced.

The practical application of hygiene is what matters most, and investigations cannot be confined to book work or laboratory researches ; the only way in which a knowledge of applied hygiene can be acquired is through study tours.

The object of study tours undertaken by health officials, jointly or singly, is to bring hygienists of one country into touch with their colleagues in another. Not only are the tours instructive for those who take part in them, but they also help to promote international co-operation and to establish contact between men engaged in similar work in different lands.

One of the duties of the Health Committee is to *establish closer relations between the administrative health authorities in the different countries*. There is no more effective way of doing this than to afford the officials in charge of the national public health services an opportunity of meeting one another, freely exchanging views on technical questions, and of profiting by each other's experience.

The organisation of these tours, which began in October 1922, was facilitated by the close relations of the League Secretariat with the various health authorities. The International Health Division of the Rockefeller Foundation realised this and granted a generous subsidy towards the tours. They have been organised in various ways: some for public health officials, others for specialists in tuberculosis, infant hygiene, school hygiene, the health administration of ports, demographic statistics, etc. By 1930, six hundred officials belonging to States Members of the League, and also to certain non-member States—such as the United States of America, Mexico, the U.S.S.R.—had participated in these interchanges of health personnel. Nearly all countries in Europe, as well as Latin America, the United States, Canada, West Africa, India and Japan, have been visited and have sent their officials to the study tours.

Numerous individual missions have been organised to enable health officials to study certain services in other countries for which a specialist was needed by the national authorities.

Individual Missions. In such cases, the Health Section draws up a programme of the visits or periods of instruction, taking into account the health and social conditions prevailing in the official's own country.

These missions have strengthened the scientific ties between Europe and distant countries like Japan, India and South America. Japanese scientists have been able to come and work in Europe and describe the results of their investigations, and Western scientists have had similar opportunities in Japanese institutes.

With a similar object, two international courses of higher instruction in hygiene were organised in Paris and London in 1927 to promote international co-operation in technical questions: the lecturers come from all parts of the world and the medical officers who attend the courses belong to twenty different nationalities. These theoretical studies are always completed by a practical study tour in a large number of European countries.

The Health Organisation has not confined itself to this direct action with regard to education; it has done a great deal also in the way of co-ordination.

Through the Commission on Education in Hygiene, established in 1925, it initiated co-operation between national institutions which give this instruction to doctors and the auxiliary personnel. There is no question of a uniform programme for institutes of hygiene; national conditions relating to medical practice and social medicine must be the primary consideration; it is a good thing, however, to give the directors of those institutes an opportunity of meeting and exchanging experiences.

The first meeting of this kind took place at the end of September 1927, in connection with the inauguration of the new Institutes of Budapest and Zagreb. The directors of the Prague, Warsaw, Rio de Janeiro and Sao Paulo Institutes took part, as well as specialists from Berlin, London, Paris and Bologna. The meeting was also attended by representatives of the Rockefeller Foundation, and by the founder of the first public health faculty at the Johns Hopkins University at Baltimore. Although the principal item on the agenda was the establishment of a special curriculum for instruction in hygiene, the discussions also showed the importance of the teaching of preventive medicine in the faculties. In addition to the discussion of matters concerning instruction, arrangements were made for technical co-operation on such questions as the supply of drinking-water to villages, oral vaccination against typhoid fever, the prevention and treatment of scarlet fever, etc.

Another form of the educational work of the Health Organisation is the training, from time to time, of highly specialised technicians; at the request of, and in conjunction with, the

Malaria Commission, regular courses in malariology have been organised in four large university centres in Europe.

In concluding this section, the educational value of study tours cannot be too strongly emphasised. The benefits are not confined to the participants ; their students, the universities in which they teach and the medical world of the countries in which they live all profit by them ; the benefits are shared also by the health officials of the countries visited.

III. THE TECHNICAL WORK OF THE HEALTH ORGANISATION IN THE VARIOUS FIELDS OF PREVENTIVE MEDICINE

The Health Committee consists of higher officials of the public health services and health experts. The complexity of its programme and the technical nature of some of the problems made it essential, as its activities spread, to distribute the work methodically among its members, and to turn in certain cases to specialists. The Committee found it desirable to set up various commissions, having at their head a member of the Committee, to which they submit the results of their work and on which they depend for their budgets ; one of the doctors in the Health Section of the Secretariat acts as Secretary to each Committee.

During the war, migrations of population, poverty, privations of all kinds and disorganisation of the medical services caused a disturbing recrudescence of malaria in Russia, the Balkan countries, Poland and even in Italy. New endemic foci were discovered and severe forms of the disease became more frequent.

The Malaria Commission, which was set up in 1924, first carried out an enquiry in the principal centres of the disease. It visited the most important foci in Yugoslavia, Greece, Bulgaria, Roumania, Russia and Italy, and was accompanied in each country by a local specialist.

After its first enquiry, the Commission considered that the so-called *primary* measures should be regarded as essential : the thorough and prolonged treatment of all persons suffering from malaria, the tracking-down of cases and the instruction of the population on the means of prevention.

It did not, however, consider that it had sufficient knowledge to give an opinion on various other anti-malaria measures, such

as those relating to the destruction of mosquitoes and the carriers of the disease, and it therefore decided to visit Syria and Palestine to find out the effect of the measures which had been partly applied in those countries.

In August and September, its investigations were extended to Spain and, in the following year, to Sicily.

Not until then did the Commission feel in a position to formulate its views about the best methods of fighting malaria in Europe. In its report it emphasised the fact that the treatment of patients—even from the point of view of prevention alone—is of primary importance. The treatment is costly owing to the high price of quinine, which is the most effective remedy. This is a very serious drawback, as malaria is usually endemic in poor districts. The first requirement to make quinine treatment more general is to reduce its cost. The cinchona tree grows very slowly and requires special conditions of soil and climate: so it is not possible to increase the output quickly. The Commission considered the possibility of using for therapeutic purposes certain secondary alkaloids of cinchona bark which had not hitherto been used, and which could be obtained at much lower prices. It had experiments carried out under strict conditions in hospitals in Italy, Roumania, Spain and Yugoslavia to determine the effect of certain mixtures of alkaloids (*quinetum*) and compared the results. These experiments, conducted over a period of several years, have shown that certain mixtures of secondary alkaloids have curative value equal to that of quinine. These cheap products can henceforward be used extensively by clinics and will to a large extent make up for the insufficient output of quinine for medical requirements.

During the tour in Eastern Europe and the Balkans, the Commission was struck by the scarcity of doctors with an adequate knowledge of anti-malaria measures. To remedy this, the Commission began in 1926 to organise at Hamburg, London and Paris theoretical courses in malariology followed by practical instruction at the anti-malaria stations and centres in Italy, Spain and Yugoslavia. In 1928, a School of Malariology was opened in Rome; in addition to medical instruction, courses are also held for engineers and agriculturists (drainage, reclaiming marshland).

Through scholarships granted by the Health Organisation, the Rockefeller Foundation and Governments, more than 250 students have been able to attend these special courses.

The Commission has co-operated through some of its experts with several European Governments. At the request of the Yugoslav Government, one of its members visited in 1924, 1925 and 1926 certain districts in that country to investigate the effect of the anti-malaria measures adopted on the Commission's advice. In 1923 and 1924, one of the Health Organisation's experts drew up in Albania a complete plan of campaign against malaria, which served also as a basis for the establishment of a Health Organisation. In 1925, at the request of the French Government, two of the Commission's experts visited Corsica and drew up a scheme for reclaiming marshlands. In Bulgaria, one expert is at present co-operating in the anti-malaria campaign with the Bulgarian health authorities and with the League Commissariat for the Settlement of Refugees.

It is not necessary to enumerate all the investigations which members have undertaken on the spot or in the laboratories on the basis of programmes drawn up by the Commission. But reference may be made to the study of endemic malaria in the marshy deltas of the great rivers (Po, Ebro, Danube), experiments into the efficacy of certain anti-larval measures carried out in the Netherlands, and laboratory work in England on the conditions of infection of mosquitoes and the possibilities of their hibernation. This work has yielded valuable results with regard to the cure of general paralysis by malaria, and to the causes and prevention of malaria epidemics in the spring.

The Malaria Commission's recommendations for Europe caused a certain amount of surprise to experts of other continents where the problems of malaria take different forms. With a view to modifying its conclusions and making them applicable outside Europe, the Commission, in 1927, undertook a study tour in the United States. When this was completed, the Health Committee summoned at Geneva in June 1928 a General Conference to co-ordinate more completely the doctrines of the different continents. This was attended by the European members and correspondents of the Commission, and several distinguished malariologists from the United States and Eastern countries.

On the three questions of the anti-larval campaign, the epidemiology of malaria and the use of quinine, the Conference reached unanimous agreement and decided to recommend certain common principles to the Governments. It also drew up a programme of international studies to be carried out under the

auspices of the Health Organisation. These studies may possibly throw some light on various points which are still obscure.

In 1929, at the request of the Government of British India, the Commission visited the malarial regions of that country. The results are not only of considerable scientific interest, but are such as can be immediately put into practice in India and tropical countries.

As soon as the Health Organisation came into existence, a Commission was appointed for the study of sleeping-sickness and tuberculosis in Equatorial Africa.

Sleeping-sickness.

After ample documentation had been collected, representatives of the Colonial Ministries of the countries concerned met in London in May 1925 and agreed upon the health measures to be adopted along the frontiers of their African Colonies. These included a passport for natives, the standardisation of the methods of registration of cases of sleeping-sickness, etc. The Conference also sent an international commission to study on the spot certain problems relating to the epidemiology and treatment of the disease.

With the necessary funds furnished by the interested Governments, an international group of specialists started work in 1926-27 at Entebbe on Lake Victoria. The Commission collected scientific information of the highest value, and unanimously recommended certain practical measures for dealing with the disease, such as international agreements for the supervision of the movements of natives, their treatment, bush clearance as a preventive measure, etc.

In November 1928, a further Conference of Government representatives was held in Paris to consider the application of the Commission's report; it also drew up a programme of investigations to be carried out by the African laboratories and recommended the co-ordination of those investigations by the Health Organisation.

In 1924, the Organisation was requested by the Yugoslav Government and the International Union against Tuberculosis to take up the problem of tuberculosis.

The first investigations showed the abundance of existing statistical information and the necessity for employing accurate

methods in the use of it. This information formed the basis for a preliminary enquiry into the causes of the decline in the tuberculosis death rate in various countries. In the report, attention was drawn to the complex nature of the factors of the disease, which makes it difficult to determine the precise value of the measures employed in the anti-tuberculosis campaign. Investigations were recommended for the purpose of ascertaining the relative importance of the various factors. As the Scandinavian countries possess reliable statistics over a long period, they were selected as the field of enquiry. Other epidemiological investigations undertaken at the same time showed the influence of urbanisation on the evolution of the tuberculosis death rate.

It has already been noted that epidemiological and health reports on tuberculosis in Equatorial Africa were drawn up in 1924 and 1925.

In 1928, a proposal was submitted to the Health Committee for the study of vaccination against tuberculosis by means of BCG (Calmette-Guérin method). In view of the practical importance of vaccination against tuberculosis and the divergent opinions about the efficacy of this method, a Technical International Conference, consisting of specialists, met in October 1928. Its three Sub-Commissions—clinical, veterinary and bacteriological—studied the effects of vaccination on children, cattle and laboratory animals. They found that the BCG vaccine was innocuous and they recognised its immunising efficacy. The Conference recommended the methodical vaccination of children so as to ascertain the efficacy of the vaccine and the duration of its effects; it drew up rules for the vaccination of cattle and recommended methods for ascertaining the fixity of the properties of BCG. Finally, it emphasised the necessity for entrusting the handling of BCG (culture, preparation and distribution of the vaccinal emulsions) to institutes of recognised standing. These investigations are in progress in a large number of bacteriological, pediatric and veterinary institutes.

Cancer. Cancer, which to an increasing extent claims the attention of hygienists, was amongst the first subjects to be studied by the Health Organisation, and various aspects of this serious problem have been under investigation since May 1923.

The work began with an enquiry of a definitely international character. The Cancer Commission tried to discover the cause of the marked difference in the death rate from cancer of the breast and cancer of the uterus—forms which are comparatively easy to diagnose—in Great Britain, Italy and the Netherlands.

It was assisted by a Statistical Sub-Committee and came to the conclusion that these differences could not be explained by any statistical manipulations or by differences in the method of establishing the diagnosis after death. It was able to determine the relation between fertility and deaths from these two forms of cancer. It appeared that cancer of the uterus was less frequent among married than among single women. A clinical enquiry, carried out on uniform principles in the three countries, afforded opportunities for a comparative study amongst women cancer patients and control cases of the relative frequency of miscarriages, the influence of lactation, surgical traumatism, etc. It showed that a large proportion of women suffering from cancer did not resort to surgical treatment—at least one-third in the case of cancer of the breast—although such treatment is capable of prolonging life, on an average, for at least three years, and even for ten years under favourable conditions.

It was proved that approximately the same proportion of women suffering from cancer had had treatment in all three countries. It was thought, therefore, that racial characteristics might possibly be the ultimate cause of the variations in the death rate. The Commission accordingly turned to anthropologists, requesting them to make a detailed study of the geographical distribution of cancer in relation to the different ethnological types found in the various countries of Europe (*homo nordicus*, *alpinus*, *mediterraneus*). The experts attempted to apply to these racial studies the results recently obtained in regard to the geographical distribution of the blood groups. These researches, which took stock of existing ethnological knowledge, did not, however, lead to any definite conclusions, for lack of sufficient data. Generally speaking, *homo mediterraneus* would seem to be less subject to cancer than *homo alpinus* or *nordicus*, although the difference is not sufficient to explain the variations between the statistics of Italy on the one hand and those of England and the Netherlands on the other.

In any event, the data collected by the Commission on cancer mortality will be of undoubted value for testing future theories

on the causes of cancer, and the results of the clinical enquiry are a sound scientific basis for a campaign to enlighten general practitioners and the public.

In addition to surgical treatment, X-rays and radium are effective weapons against certain types of cancer. There is some difference of opinion about the value of these methods, largely due to the fact that radium and X-rays are differently applied.

To clarify the position, the Health Committee set up a Sub-Committee of Radiologists. The Directors of the Curie Institute at Paris, of the Gynæcological Clinic of the University of Munich and of the Radium Institute at Stockholm pooled their experience with a view to defining the technique of treatment and to adopting a uniform system of observation and a single nomenclature for the forms and stages of cancerous growths, so that the results of treatment in their Institutes or in other establishments taking part in this research might be accurately determined.

Another Sub-Committee studied the various forms of occupational cancer : weavers' cancer, cancer among workers employed in the chemical industry and in the extraction and treatment of radi-ferous ores. As a result of this investigation, it should be possible to protect workers more effectively and to furnish useful information on the underlying causes of the disease.

In 1925, public opinion in some countries
Smallpox and Vaccination. was alarmed on account of nervous lesions which occurred among children recently vaccinated against smallpox (post-vaccinal encephalitis).

A Commission was set up to study the facts and to discover a method of preventing such accidents.

The public health services of the countries in which the accidents occurred were asked to furnish detailed information. The facts were then submitted to a thorough investigation. Particular attention was devoted to the methods of preparing, testing, distributing and applying vaccine lymph adopted by various vaccine institutes. The different methods employed to test the potency of the emulsions were compared and standardised.

This careful examination led to the conclusion that cases of encephalitis could not be attributed to the lymph, and that the method of preparation and the degree of potency had nothing

to do with the matter. The Commission's report gave evidence of the rareness of cases of encephalitis in relation to the number of vaccinations, and of the possibility of avoiding accidents by giving the first vaccination before the child is one year old—that is to say, before it has acquired any latent infection which might lead to post-vaccinal accidents. This opinion is particularly valuable, as the statistics of the Epidemiological Intelligence Service show very clearly the heavy incidence of smallpox in countries where vaccination is not compulsory.

The Eastern Bureau is also dealing with smallpox and co-ordinating the results of experiments with dry anti-smallpox vaccines.

In Europe there are isolated cases of leprosy
Leprosy. in certain Baltic and Scandinavian countries. But in South America and various Eastern countries it is a real social scourge; according to reliable estimates, there are no fewer than one million lepers in British India.

The Health Committee appointed a Commission of Experts which, in May 1928, gave its considered opinion on a question of capital importance—namely, the early diagnosis of the disease and its consequences.

Formerly, it was the rule—and it still remains the rule in many countries—to segregate the unfortunate victims of leprosy and even to imprison them for life in leper colonies. Through fear of this treatment, infected persons conceal their symptoms as long as possible; they help to spread infection and are no longer curable when finally discovered and taken to hospital.

The Commission advocated the more humane and more effective system of voluntary diagnosis and early treatment in out-patient dispensaries; at the same time, it recommended a campaign to spread the knowledge of prophylactic measures in the population.

It also decided upon an enquiry into the means by which the disease is communicated and the most satisfactory forms of treatment. For this purpose, the secretary to the Commission, an expert from the Pasteur Institute, made a study tour in 1929 in countries where leprosy is prevalent—in Europe, South America, British India, the Malay States, the Netherlands East Indies, the Philippines and Japan. He collected information and explained to local experts the views of the Commission.

Since Pasteur discovered how to prevent hydrophobia in people bitten by mad dogs, many institutes have been founded throughout the world to carry out his treatment. It was subsequently considered advisable to make some changes in the original method of preparing rabies cords for inoculation; these modifications vary with the institute and the country.

In 1927, the Health Organisation began an investigation into the results obtained by these various methods—to compare their prophylactic efficacy, the frequency of accidents due to their application, their cost and the possibility of using vaccines in places some distance from anti-rabies centres.

About a hundred institutes replied to the questionnaire of the Health Organisation.

An International Conference was held at the Pasteur Institute at Paris in April 1927, at which sixty representatives of Governments and anti-rabies institutes were present. A special commission discussed the nature of rabies virus, important contributions having recently been made to existing knowledge on the subject; another commission dealt with public health regulations and orders for international veterinary quarantine and recommended modifications corresponding to the present stage of scientific knowledge.

The report of the Conference, which contains a critical analysis of the information received and the conclusions reached, is a unique record of all that is so far known about rabies.

One of the results of this Conference was that the majority of the anti-rabies institutes adopted a method of uniform statistics which aids the comparison of results. In 1930, the Health Organisation published for the first time an analysis of these annual statistics covering more than 31,000 cases. There can be no doubt that the material so collected will within a few years afford a reliable basis for the application of certain elements in the treatment of rabies which are at present obscure.

Numerically, the mortality of children under one year of age is one of the outstanding features in the death rate; it accounts for one-tenth of the total number of deaths.

Infant Mortality and Child Welfare. Preventive medicine can reduce this mortality very considerably. Prophylactic measures must, however, be adapted to the conditions prevailing in the different

countries and to the local causes of this mortality. In 1926, the Health Organisation called together experts to investigate the problem; they resolved to make an international enquiry on uniform lines to determine more accurately than is possible by means of official statistics the causes of deaths among children under one year of age in certain carefully selected parts of the world.

The enquiry was carried out in Austria, England, France, Germany, Italy, the Netherlands and Norway. In each of these countries, two urban districts were chosen, one with a low and the other with a high infant mortality rate, and two rural districts showing the same variations. Pediatricians were made responsible for local investigations and for the preparation of nomenclatures specially devised for the investigation; every precaution was taken to ensure the greatest possible accuracy and comparability.

The experiment was entirely successful. It showed that the largest number of deaths was due to still-birth and premature birth and indicated the effects of inadequate pre-natal and obstetrical treatment; respiratory diseases and gastro-intestinal affections only came second on the list of the principal causes of death.

With a view to eliminating respiratory diseases, the experts concentrated their attention on immunisation processes against the infectious diseases which are their primary causes: diphtheria, measles, scarlet fever, whooping-cough. The experience gained in different countries was carefully collected, compared and, in a sense, codified. The investigators were greatly assisted by the work done by the experts of the Commission on the Standardisation of Sera and by the Conference of Directors of Public Health Institutes; they also turned to account the research work on vaccination of children against tuberculosis.

The infant mortality experts likewise dealt with the question of the training of medical practitioners, midwives and nurses.

The enquiry on infant mortality in Europe placed such valuable data at the disposal of the European public health administrations that the South-American authorities were anxious to have the investigations extended to their countries. South-American experts were therefore called together in conference at Montevideo in 1927. An enquiry was organised in the Argentine, Brazil, Chile and Uruguay on the lines of the European investigation; a further conference met at Lima in 1930 and considered the possibility of extending the enquiry to the other South-American Republics. Apart from the technical results, these

investigations have been the means of establishing close co-operation between the experts of different countries.

At the British Government's request, the Health Organisation collected data on the welfare of blind persons and the prevention of blindness, with a view to enabling certain countries, by acquaintance with the provisions applied in other countries, to extend the scope of their legislation concerning relief.

In 1928, about thirty nations furnished the data requested; the International Labour Office gave its assistance on matters within its competence.

The report analysing these data contains valuable information on the number of blind persons in the world, the definition of blindness, the medical and accidental causes, protective legislation, facilities for the education and recreation of the blind and semi-blind, the occupations and professions open to them and the societies formed for their assistance.

One of the outstanding causes of blindness—in fact the principal cause in certain Mediterranean districts and in hot countries—is granular conjunctivitis or trachoma.

This disease is of considerable significance from an international standpoint, because of its worldwide distribution and because of the restrictive measures against immigration which some countries have been obliged to take on that account.

The Health Committee, at the request of its Dutch and Italian members, made an enquiry into the incidence of trachoma, and it also undertook the publication of documents on the legislative, public health and medical measures adopted in different countries for the prevention and cure of this disease.

In certain remedies, the doses of serum cannot be measured merely by weight, owing to possible variations in their chemical composition and therapeutic potency. To ensure their correct use, experiments are carried out on laboratory animals; the standard unit of the remedy is the quantity which will produce a given effect upon an animal of a given species.

Standards for one and the same drug or serum differ widely in different countries, and this diversity causes a great deal of

trouble to medical practitioners in countries which obtain their supplies from foreign sources : a doctor, for example, who is accustomed to administer 1,000 German units of a certain preparation to obtain a given clinical effect will only obtain negligible results with 1,000 American units, as the American units are one-third the size ; this may involve serious risks for the patient.

The Health Organisation attaches the greatest importance to the definition and adoption of international standard units for therapeutic sera and for certain medical preparations. In 1921 and 1922, international conferences drew up a plan of work, and a Permanent Standards Commission was subsequently made responsible for the direction of research. It is not possible to enter into technical details here, but an explanation of the method of work adopted may be of interest.

After the standardisation of a particular serum or product has been decided upon, the Commission usually begins by preparing a detailed scheme of research, which is entrusted to a number of public or private laboratories. The results are communicated to the Serum Institute at Copenhagen, which acts as a central laboratory for the Health Organisation. When the Commission considers that the results of the experiments are such as to lead to definite conclusions, it summons the research workers to a conference, at which a compromise between any surviving differences of opinion is easily effected. In the rare case of difficulties remaining after this first meeting, the Commission draws up a new programme of supplementary research, and then summons a second conference at which unanimous agreement is invariably reached.

When a standard unit has been fixed and the methods of comparison have been meticulously determined, one of the large public laboratories, such as the Serum Institute of Copenhagen, the National Research Institute of London, the Pasteur Institute of Paris, the Hygienic Laboratory of Washington, or the Institute of Experimental Therapy at Frankfort, is made responsible for the preservation of the standard. This laboratory, acting on behalf of the Health Organisation, provides for the distribution of *standard units* to the various scientific laboratories, both Government and commercial, so that they may grade their products in *international units*, which the Governments are themselves requested to adopt officially in their pharmacopœiæ.

In the matter of sera, researches have been made with a view to the standardisation of anti-diphtheritic serum and diphtheritic anatoxin (the most efficacious remedies for the cure and prevention of diphtheria), anti-dysentery and anti-tetanus sera, cerebro-spinal meningitis and scarlet fever sera, and tuberculin.

As regards medical preparations, the Health Organisation has determined the units of worldwide standards for insulin—the specific remedy for diabetes; digitalis—the cardiac tonic *par excellence*; rye ergot and pituitary extract—obstetrical drugs; extract of male fern and oil of chenopodium—valuable vermifuges.

It has also established standards for arseno-benzenes and their derivatives, which are the most effective weapons against syphilis.

Another particularly notable piece of work on standardisation has been carried out in regard to syphilis. To diagnose this disease, a test is made of the blood serum of the patient, in addition to the clinical examination. The original processes of sero-diagnosis named after Bordet and Wassermann were followed by several others based on the same principle, and more recently by new methods founded on the principle of flocculation. As these different processes sometimes produced inconsistent results, it was necessary to compare the relative specificity and sensitiveness of the various reactions so that doctors would not be misled.

Two laboratory conferences held in 1923 and 1928 gave an opportunity to the inventors of new or improved sero-reactions to meet. At the 1928 Conference, conclusive experiments were carried out by sixteen specialists on 950 specimens. Any doubts as to the respective merits of the various techniques would now appear to be dispelled.

Apart from their purely scientific results, these conferences had the advantage that scientists of various nationalities who might otherwise have considered themselves as rivals were able to work side by side in a genuine spirit of co-operation.

Co-operation between Insurance Organisations and Public Health Services. The adoption by an increasing number of States of more or less adequate systems of social insurance has drawn attention to the social and financial burden imposed upon the community by disease and to the expediency of eliminating as far as possible the diseases which are preventable.

The Governments have organised their public health services for this purpose. As, however, the appropriate budgetary estimates are in most cases inadequate, attempts were naturally made to enlist the co-operation of the insurance organisations in the preventive work by which they necessarily benefit.

In order to study possible methods of such co-operation, the Mixed Commission, consisting of representatives of insurance organisations appointed by the International Labour Office and of medical officers appointed by the Health Organisation, was established in 1927. Mixed Sub-Commissions were set up to deal with the different branches of the work—education of the insured in hygiene, maternal welfare, infant welfare, prevention of tuberculosis and prevention of venereal diseases. The Sub-Commission of Social Medicine studied the practical results of various forms of co-operation during a study tour in Germany and Austria.

This research, which is greatly complicated by the importance of the interests involved and by the variety of the national institutions, has produced instructive results, which may at a later date facilitate the rationalisation and expansion of public health work in countries with a social insurance system, and thus avoid the regrettable lack of contact which so often exists between curative and preventive medicine.

Social insurance is not the only subject in which the International Labour Office has co-operated with the Health Organisation. The same method was adopted for research in connection with malignant pustule or *anthrax*, a serious affection to which workers handling infected skins are exposed.

The two organisations make joint arrangements for study tours by industrial medical inspectors.

Within the League itself, the Health Organisation is co-operating with the Advisory Commission for the Protection and Welfare of Children and Young People, the Transit Organisation (sanitary conventions), the Economic Organisation (veterinary questions), the High Commissioner's Office for the Settlement of Bulgarian Refugees (campaign against malaria and syphilis amongst Bulgarian refugees). The Health Committee and its experts furnish the Opium Commission with technical advice as to the legitimate medical requirements of the world in narcotics

and the advisability of bringing any new drug within the scope of the International Convention on the Traffic in Drugs, etc.

Co-operation between the Health Organisation and the Public Health Authorities of Various Countries. The public health authorities of all countries benefit from the work of the Epidemiological Service of the Health Organisation and from the experience of its technical committees; they can also at any time request the Health Organisation to place experts at their disposal to carry out specific tasks, and they have in fact done so. Sometimes an opinion is required on measures to cope with malaria, syphilis or an epidemic of dengue, and sometimes the request is for advice on the re-organisation of

the public health administration of a whole country. Such requests have recently been received from Greece, Bolivia and China.

As soon as the Council had, in December 1928, approved the co-operation of the Health Organisation in the re-organisation of the public health service of Greece, the Committee despatched experts to collect data on the spot and to carry out the preliminary enquiries; when that was completed, the experts were joined by a delegation from the Health Committee which, in agreement with the Greek authorities, drew up a plan for the re-organisation of public health work in Greece. Their programme provided for the establishment of a public health service and a school of hygiene, and these bodies began work almost immediately in certain districts. The number of districts in which the new system is applied will increase as soon as competent workers have been trained, and within a few years the new organisation will cover the entire country. By way of assistance during the initial stages, a number of Greek public health officials have received grants from the Health Organisation to study abroad.

In August 1929, the President of the Bolivian Republic applied to the Health Organisation for assistance in re-organising the public health service of Bolivia. Two experts were sent to make a preliminary enquiry, and the work of reform is now being carried out.

In September 1929, the Chinese Government asked the Secretary-General of the League to send a committee of experts from the Health Organisation to study the public health service

of the ports and the quarantine system. The Medical Director and one expert went to China in response to this invitation and drew up a plan for co-operation with the Chinese officials in the thorough re-organisation of the quarantine system and in the creation of medical and public health centres, which will make it possible gradually to improve the public health system of the Chinese Republic.

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In all its undertakings, the Health Organisation has fully observed the principle of co-operation between all nations, as laid down in the Covenant of the League. Its work responds to the universal need for the prevention of disease, which is felt more or less acutely in all countries and in all continents. It has extended its activities to all parts of the world—to the Far East and to America, to Africa and to Europe—and the results obtained during the past ten years are of good augury for the future.

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