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## **PUBLIC HEALTH AND MEDICAL SERVICE IN SIAM.**

### **Historical Summary.**

Evidence is not lacking that disease has played an important part in shaping the course of Siamese history. Even before the Tai people penetrated the Khmer Empire, which in the first century of the Christian Era extended throughout the Indo-Chinese Peninsula, outbreaks of pestilence among their enemies had in A. D. 750 and 754 materially assisted them in repelling the Chinese invaders from Nanchao, their original country, thus retarding their own entry into Siam for almost a hundred years. During the period of Khmer hegemony it may be gathered from historic remains in some of the walled towns that consideration was given to sanitation as then understood. In 1350 the foundation of Ayudhya, which for over four centuries remained the capital of Siam, was directly due to an epidemic which caused the abandonment of U-Thong, a previous metropolis.

The first definite mention of cholera in Siamese history was 1357; while in 1534 smallpox was recorded as having caused the death of Paromaraja IV. Plague was, however, a much more recent occurrence, and was probably introduced from India in 1904.

As is to be expected, the indigenous arts of healing are derived from the empirical methods of India and China modified by local usage. The first medical missionary from Europe arrived in 1676 in the person of a Jesuit who was installed in a hospital established by King Narai. Western methods of treatment have probably been introduced into the country previous to this through contacts with the Portuguese dating from the beginning of the sixteenth century, and later with the Dutch and the English.

Very early in the eighteenth century Siam suffered from a

severe famine and drought. The Chao Phya River was covered with "an evil-smelling green slime." Sickness broke out, and the authorities, apprehending an epidemic, forbade the people to drink it. As no other water was obtainable, "the people became restless and rebellion was imminent. Thereupon it was announced that the god Indra had appeared at the city gate and had declared that the green scum was a panacea for all the diseases in the land. The whole populace rushed to the river to anoint themselves with the scum and the polluted water." \* Heavy rains however saved the situation. This is the first authentic indication of a subtle public health policy in the past. Siam became greatly depopulated about this time as the result of continuous wars. During the final siege of Ayudhya by the Burmese, the resistance of the inhabitants against their enemies, both human and microscopical, was so reduced by starvation that they became easy prey to an epidemic, "and the streets were strewn with corpses, which were left to be devoured by the pariah dogs." \* Ayudhya was sacked and razed to the ground on April 7th, 1767, and thus for the second time disease was a contributory cause of the setting up of a new capital for the country, namely the present city of Bangkok.

The advent of the American missionaries in the first half of the last century was soon followed by their medical missions, who first practised arm-to-arm vaccination against smallpox in 1840, and later manufactured bovine lymph until the product of the Government became freely available. They established at Xieng-mai the first institution for lepers in this country which receives a grant-in-aid from the Government.

One of the first attempts to deal with leprosy in Siam was the designation of a remote village for the segregation of lepers by one of the northern Rulers. No compulsion has been used for the last few decades, and yet the population of the village still consists largely of persons afflicted with this disease who appear to be reasonably contented. Such villages or "leper colonies" also exist in the eastern provinces. They are considered as promising guides to future efforts in dealing with this as well as

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\* A History of Siam by W. A. R. Wood, C.I.E.

other analogous difficult social-hygienic problems on a national scale, due regard being given to economical ways and means.

In 1889 the opening of the Siriraj Medical School marked the beginning of public medical education along scientific lines. Upon this has been built the present well equipped school with its highly qualified full-time Medical Faculty through which medical training in this country is rapidly approaching the highest standards. This advancement of medical education which has been made possible by the co-operation and assistance of the Division of Education of the Rockefeller Foundation, is recognised as indispensable for the development of both the public health and medical service of the nation.

As in many countries, the first incentive to public health work appears to have been a desire to combat epidemic diseases, for even within living memory both smallpox and cholera have wrought terrible havoc among the population. Unfortunately few reliable records exist as to the actual number of deaths in the absence of organised notification. From various accounts it may be gathered that efforts were directed towards relief rather than prevention. Among the first steps in the latter direction was the appointment of an American physician then practising in Bangkok to supervise the sanitary conditions of the city. Not long after this, in 1897, what may be termed the first public health law was promulgated providing, among other things, for a medical officer of health and a city engineer. This was the Local Sanitation Enactment of R. S. 116; and it begins with an interesting preamble from which the following extract of the translation may be quoted:—“ . . . it appears advisable as a first step towards the preparation and execution of a complete and permanent scheme of sanitation in the City of Bangkok to appoint sanitary officers who under the supervision of Our Minister of Local Government shall gradually carry out such sanitary works as will be hereinafter enunciated and who under the same supervision shall inquire into the general conditions of the City so as to be able to propose from time to time such regulations to be made and such works to be put into execution as may be conducive to an improvement of the

sanitary conditions as also to the general embellishment and amenity of the Capital." It still remains to this day the basic sanitary law for Bangkok.

Maritime Quarantine was instituted from time to time by Royal Decree between 1901 and 1905 when a permanent quarantine station was established on the island of Phra, the Medical Officer of Health of Bangkok being appointed as Port Health Officer.

About this time the Government Medical Depôt and Vaccine Laboratory were started in the Ministry of Public Instruction, being the authority in charge of medical education. These were later transferred to the Ministry of the Interior, the latter establishment being combined with the newly founded Pasteur Institute in 1911. With this nucleus the Medical Department of the Ministry of the Interior was formed. It was the forerunner of the present national health organization. Its activities were at first confined to the supervision of strictly medical matters of the interior provinces, and apart from the occasional combating of epidemic diseases and vaccination against smallpox, it was largely concerned with medical service to provincial officials and prisons. It however dealt with the medical supplies of the various government departments as well as those of the provincial hospitals and dispensaries, over which it exercised a technical control. It also prepared and supplied eight more or less modern simple remedies for the use of people in the provinces.

In 1909 the Provincial Sanitary Organization Law, R. S. 127, was gazetted. It created Sanitary Boards for towns and other communities whose duties under the provisions of Section 4 were (1) the maintenance of cleanliness, (2) the *prevention* and treatment of diseases and (3) the upkeep of the roads. The supervision of these Sanitary Boards was not entrusted to the Medical Department until 1915 from which may be dated the inception of the national public health policy of to-day. This will be dealt with under other headings.

In 1911 the Siamese Red Cross Society assumed control of the Pasteur Institute, already combined with the Government

Vaccine Laboratory, and upon this foundation built the Queen Sawabha Memorial Institute which now serves as the vaccine and serum laboratory of the Central Health Authority. The Society, the International Health Board and the Division of Medical Education of the Rockefeller Foundation have been important factors in the recent medical and public health progress of Siam.

Negotiations between the Royal Siamese Government and the International Health Board dated back to April 1915. Since then joint projects have been carried out by the latter with the Medical Department, the Siamese Red Cross Society and the present health organization of the Government. These activities in which the Board participated became later known as the "Sanitary Campaign", the influence and effect of which was of such great value that it deserves a special account in this brief record of the "public health movement" in Siam.

In 1918 the present Department of Public Health was instituted by Royal Decree to supervise the medical and public health services both of the Capital and of the Provinces. Certain national health activities which theretofore had been carried on by the Ministry of Local Government were assigned to the Department which gradually assumed other functions of this nature. After the amalgamation of the Ministry of Local Government with the Ministry of the Interior, the Office of the Medical Officer of Health of Bangkok was placed under the direct control of the Department of Public Health in 1925. This was admittedly an expediency to raise the standard of the medical and health work of the Capital pending its ultimate re-organization as a self-supporting municipality.

The Medical Council was created under the Medical Act of B. E. 2466, two years previous to this; while in 1928 the long projected National Health Council was finally instituted by Royal Decree. These Councils form part of the machinery of the Ministry of the Interior, the Director General of Public Health being *ex-officio* president of both bodies.

Thus it will be seen that the centralization and co-ordination of the public health and medical functions of the State is fairly

complete.

#### **The Sanitary Campaign.**

A campaign for the relief and control of hookworm disease began in February 1917 in response to an invitation extended to the International Health Board by the Royal Siamese Government. Headquarters were first established in the North at the town of Xiengmai. In order to secure greater flexibility necessary for rapid expansion, the undertaking was transferred, through the recommendation of the Medical Department, to the Siamese Red Cross Society in 1920, a special division of the Society, subsequently called the "Health Section" being created for the purpose. A general hookworm survey and considerable health propaganda was conducted in forty-four out of the seventy-nine Provinces of Siam. At the close of a three year period of co-operation both organizations realized that, to guarantee the permanency of results then achieved, it would be advisable to carry out further developments under the Department of Public Health. The retransfer of the work from the Society to the Government was effected in September 1923, and a five year arrangement was made by which the Government gradually assumed full financial responsibility.

This affords an illustration of the important rôle played by the Siamese Red Cross Society in undertaking social-hygienic and other scientific work of an experimental nature which, with its greater advantages in enterprise and flexibility of control, the Society is able to develop with the intention of ultimately handing it over to a government department. This pioneer work is invaluable in view of the more conservative financial methods of the latter.

The "Sanitary Campaign", thus forming a division of the Department of Public Health, consisted of nine field units. The administrative staff was located in Bangkok, while five Extensive Units, largely devoted to hookworm control, were scattered in the interior districts. There were, in addition, a Health Boat Unit, an Intensive Unit, an Educational Unit, a Laboratory Unit and a considerable number of sanitary inspectors who were permanently placed, or anchored as it were, in the wake of the control work.



The International Health Board assigned two representatives to Siam, and the total personnel of the Campaign numbered over two hundred employees at one period of its activity.

Well over a million treatments for hookworm disease have been given in Siam, thereby affording relief to a considerable percentage of the population whose vitality and efficiency were being sapped by this insidious parasite. Where soil pollution was prevalent thousands of latrines have been erected, establishing there "a veritable fortification against reinfestation" and against all infectious intestinal diseases which, in this country, include cholera, dysentery and typhoid fever.

By means of the Intensive Unit a local health organization scheme has been developed at Lobpuri in close co-operation with the Sanitary Board of the town. This was begun in December 1924. The plan was to foster as complete a system of health work as local resources will permit, which should serve as a model for other communities. A special census of the population and a thorough health survey were carried out as a preliminary to a close study of the existing conditions. Popular health education in all its forms was utilized to the utmost both before and after each phase of the work in order to ensure full understanding and co-operation on the part of the inhabitants. To the dispensary service of the Sanitary Board was added maternal and infant welfare work, and the local health personnel were given a special training. This work which is nearing completion, and is being transferred to another town, is regarded as a useful experiment from which invaluable data have been obtained giving insight into the important problem of local health administration.

In consequence of the work of the Intensive Unit, the Laboratory Unit was formed. It consisted of a bacteriologist, his assistants and necessary equipments. The purpose of this itinerant laboratory has been to introduce laboratory methods into health work in the interior and to stimulate interest among the local health officers from which local research may be developed in the near future.

Owing to the special dispensation afforded to the Sanitary

Campaign by the financial authority, the Health Boat Unit owed its existence since 1925. Its duty has been to minister to the large riparian and floating population of the Chao Phya River, estimated at not less than a million souls. "Health Boat 1" is approximately sixteen metres long with a three metre beam, and is equipped with a cinematographic projector and other educational materials. It has its own motor power and electric light plant, and tows a house-boat in which the health crew live. It is also fitted out as a dispensary by means of which a population, which is practically inaccessible by other means of travel, has been reached with educational and remedial measures. This cruiser of public health is considered as a valuable reinforcement to the land forces operating against disease in Siam.

The part played by the Campaign in health education will be mentioned in conjunction with the general work of the Department of Public Health along these lines. It should be recorded here, however, that during the five years of its activity, the major part of the educational work of the Department has been entrusted to its care, and that the annual courses of instruction for health officers and sanitary inspectors were first organized through its means respectively in 1924 and 1925. In this connection it should also be mentioned that a number of fellowships for the study of preventive medicine in the United States have been granted by the International Health Board to promising health officials in Siam who were recommended by the Government. All these have succeeded in obtaining the degree of Dr. P. H., and are holding responsible posts. The significance of such a training for the health development of the country may be readily appreciated.

Beside these activities, the Sanitary Campaign, in the course of its field work, gave instructions regarding malaria to local medical practitioners and the general public in the malarial districts visited, and a large number of cases of the disease have also been treated. During the world-wide epidemic of influenza in 1918, the entire personnel of the anti-hookworm work participated in the general efforts of prevention and relief; while in 1921 a unit of the Campaign gave effective assistance in carrying out

anti-plague measures in the town of Lampang.

It cannot be sufficiently emphasized that the relief and control of hookworm disease, which led to the organization of the Sanitary Campaign, has been more than an end in itself. It has lent itself well for the purpose of demonstrating the cause, the mode of transmission, the cure and means of prevention of a large and important group of diseases. Indeed it has been a means of teaching the public the modern scientific conception of preventive medicine and thereby arousing in them the latent humanitarian spirit which has been aptly termed "the public health conscience." For the national health organization itself it continuously served as a handy stick with which to drive the contrary Erymanthus Pig of passive resistance, and at times as a magic armour to ward off the hydra of active opposition, the one an offspring of ignorance, the other of misunderstanding.

#### **Public Health and Local Government.**

The general system of local administration of the Kingdom is of necessity highly centralized in its nature. It is carried on by the Lords Lieutenant of Circles (the Lord Prefect, in the case of the Metropolitan Area), Governors of Provinces and District Boards in accordance with the general provisions of the Local Administration Law. The Headmen of Communes with their deputies, the Commune "Medicos", mostly practising the empirical art, and the Village Elders are chosen by the people with the approval of the Local Authorities. The powers and duties of the above as regard health matters are dealt with under the following heading of Legislation, the Department of Public Health exercising technical control through their local representatives, the Health and Medical Officers.

The Sanitary Boards, which are given a measure of local self-government under the provisions of the Provincial Sanitary Organization Law, are at present administratively, technically and financially supervised by the Department of Public Health acting on behalf of the Minister of the Interior who, with the assistance of the Lords Lieutenant, has charge of the execution of the law. The Sanitary

Boards of towns, consisting of five official members and four Headmen, are presided over by the Governors of the Provinces in which the Sanitary Areas are situated; while those of smaller communities, which consist of three official members and two Headmen, have the District Officers as their Chairmen. The local house-duty, certain licence fees, rents and other income, derived from the economic undertakings of the Boards, form their present modest revenue from which the salary of their employees and general expenses are paid.

Although primarily conceived for the purpose of sanitation in its narrower sense, these organizations have, in course of time, assumed certain delegated governmental functions and have undertaken various corporate activities generally of the nature of such public utility as the supply of water and electric power, the management of the public market and slaughter house, for which the ability to raise loans has recently been conceded to them. They employ health officers and other physicians and support hospitals or dispensaries. Many of them also employ nurse-midwives for infant and maternal welfare. The development of these Sanitary Boards into municipalities with greater fiscal and administrative autonomy is regarded as of great potential value for the progress of both the public health and the public medical service of the nation.

The course of their progress for the last few years indicates their future development along lines which should include the three essential functions of local government, namely those of *health, safety and convenience*.

It is usual in other countries to entrust to such local bodies the power of issuing bye-laws; and the introduction of local rates assessed on the annual value of land and buildings should replace the present somewhat antiquated tax on houses. This would introduce a system of local taxation in accordance with real capacity to pay, and would incidentally put a premium on dwelling houses of a higher sanitary standard. The raising of local loans should be further encouraged for the purpose of general sanitary improvements. Infectious diseases other than the four at present

notifiable by law may be brought under control in the near future; while the recording of births, deaths and general morbidity may be made with a considerably greater degree of accuracy. The question of water, food and drugs, of markets and slaughter houses are of paramount importance. General sanitary regulations, the prevention and abatement of nuisances, especially those affecting health, a more efficient method of disposal of waste materials, the power to deal with insanitary buildings, overcrowding with humanity or goods, common lodging houses and obstructive buildings would all tend to raise the standard of community life. Better control of the construction and maintenance of streets, buildings, back-lanes and of the clearing of open spaces is indispensable; and adequate provisions for the financing and execution of improvement schemes as well as town-planning, with a view to future growth, is considered of the utmost importance.

As regards public safety, there is an urgent need for well organized fire brigades with suitable equipments as well as for up-to-date signalling systems; while the exigencies of modern traffic call for well trained forces of municipal police to enforce its control. The relief of the poor, the aged as well as those afflicted with incurable and disabling diseases, including lunacy and mental deficiency, may at first be made a local duty and possibly financed by means of the net proceeds of municipal pawnshops as has been done elsewhere. Provisions for public convenience, which more often than not usurp the position that should be occupied by more necessary or useful public services, should be given their place in the scheme as may be justifiable by their relative value as means for better health. Thus public latrines, urinals, baths, wash-houses, parks and play grounds may be given their precedence.

The institution of municipalities as they have been above envisaged would further the general ends of government, and would be an additional means of fulfilling the aims of primary education without which public health, in the modern sense of the word, is an impossibility.

In this connection it may be of interest to quote the following

passage from a letter written to the present Director General of the Department of Public Health in July 1928 by Sir George Newman, Principal Medical Officer of the English Ministry of Health:—"We in England have rather continuously held the view since the early part of the nineteenth century that the central office dealing with health should also deal with local government, partly because health is, in fact, administered by the Local Authorities, and partly because of the principle that public health and local government are inseparable. The alternative is unthinkable in practice, namely, to have a Ministry of Health which is *only* health in the abstract or medical service in practice. To make health actual and to dovetail medical services in the whole system of Government, it is essential that the central department should deal with both, though it may subdivide itself into sections for its respective functions." This evidently justifies the present position of the Department of Public Health as far as the future development of local self-government is concerned.

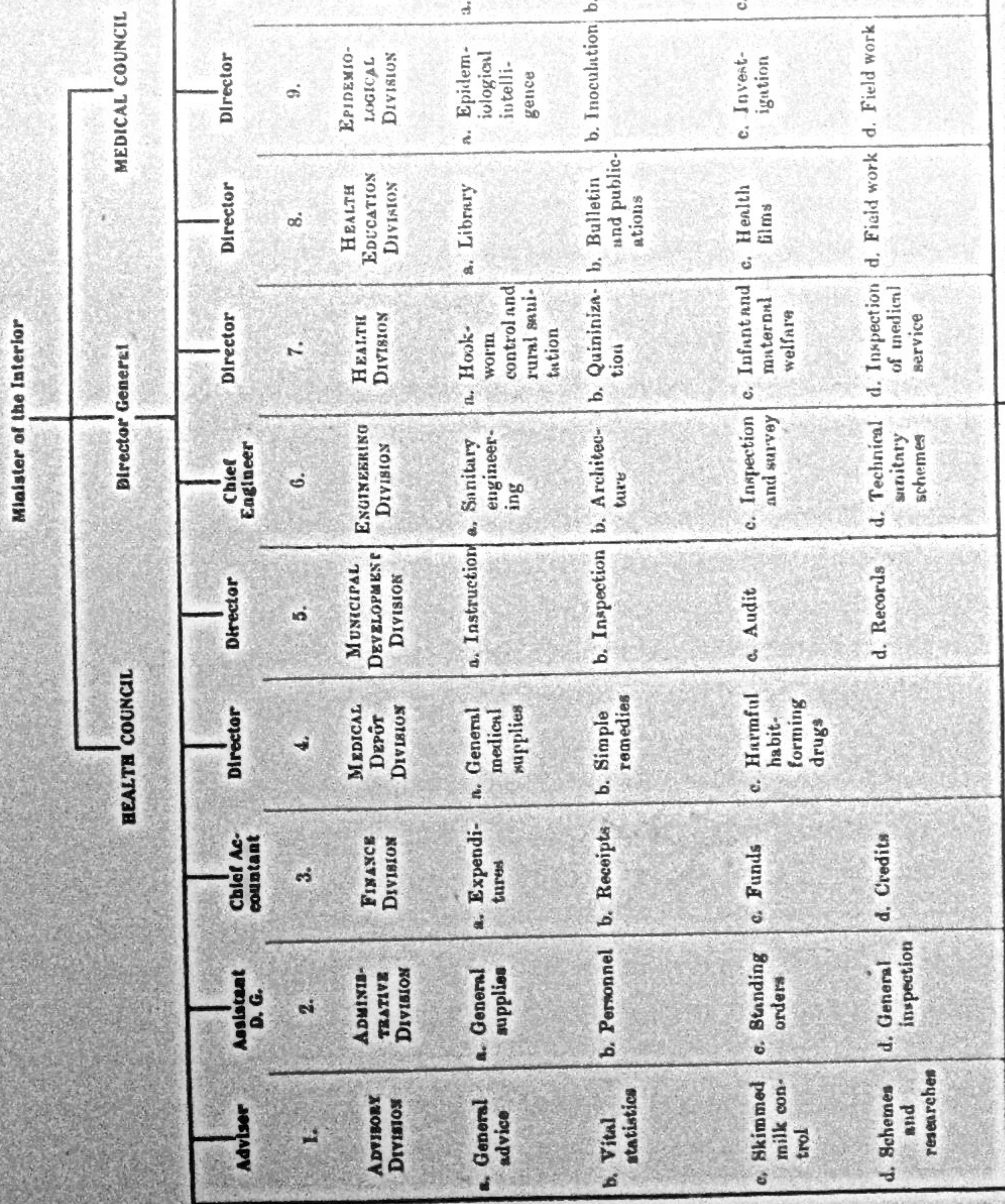
#### **The Central Organization.**

Notwithstanding references to the Department of Public Health as the national health organization, it should be understood that the Minister of the Interior is the superior health authority and that the final responsibility for the public health and public medical service of the Kingdom rests upon him. The present organization of the Department is indicated in the appended diagram, showing the various divisions and sections, the actual principal functions of which are thereby indicated.

The Advisory Division is somewhat different to the others in that it is, in principle at least, of a temporary character, and is usually made responsible for activities needing organization and special attention for development, later to be assigned to other divisions or to be formed into entirely new ones.

The Sanitary Campaign serves as a good illustration of such a process of what may be described as crystallization of functions. During its existence it formed a distinctive division of the Department. Upon the termination of the five year arrangement made between the Government and the International Health Board and

DIAGRAM OF THE CENTRAL ORGANIZATION OF HEALTH AND MEDICAL SERVICE.



The Field Staff of the Central Organization

the assumption of full financial burden by the former, the Campaign was liquidated and its activities were assigned to different divisions in April 1929. Thus the Divisions of Health Education and Epidemiology were formed out of its personnel and resources, while four out of the original nine Units were retained by the Health Division, which was also made responsible for the technical supervision of the sanitary inspectors, appointed as part of the programme of the Campaign, and now forming a regular part of the local health staff. A certain number of these are employed by the Sanitary Boards while the remainder as well as a considerable number of additional recruits are paid by the central department mostly from the "Sanitary Campaign Fund" which remains at the original annual figure of 90,000 Baht (approximately £8,180) appropriated for the purpose at the outset. These scions of the Campaign are thus permanently grafted as it were on the stocks of local health organization.

It has been stated under the heading of Public Health and Local Government that the department exercises technical control of local matters affecting the public health through the Health and Medical Officers. With the exception of a small minority employed by the Sanitary Boards, all these officials are actual members of the staff of the central department, or to be more precise, these medical men, subject to certain concessions made to the Local Authorities as regard discipline and local transfers, are appointed, assigned, or promoted and in some cases degraded or dismissed by the Central Authority who also provides for their salary.

The rapidly growing demand for the services of the Divisions of Municipal Development and Engineering of the Department is one of its present most important features. For an organization devoting itself almost entirely to "medical service in practice," and consequently to "health in the abstract," the inclusion of such activities as are implied by the names of these divisions would be entirely out of place. A stereotyped public health policy that fails to grasp relative values and take proper means to attain practical ends would be an abstraction indeed! The concrete fact,



however, remains that the aspirations of uneducated human nature, especially as exemplified by the ubiquitous cheap building contractor, who dares to venture where not only a qualified but an expert engineer or architect fears to tread, is responsible for most of the existing insanitary surroundings. As is invariably the case, what prevails in the towns is promptly adopted by the rural districts. It was such emulation of the high by the low, the rich by the poor and the sophisticated by the simple that first inspired the Department with the idea of closely interesting itself with the construction of public buildings, places of popular resort and prisons, not omitting the residences of government officials in the provinces. Such more obvious works as slaughter houses, drains and water-supplies of the interior are within its sphere as a matter of course. Then again there are certain kinds of structures and works that are of special significance to health in this country. Such things as barns, wells and latrines, to cite but a few examples, are of importance as models. It will thus be seen that the engineers and architects of the Department are carrying out works of considerable educational value apart from direct utility.

The present financial circumstances of the Sanitary Boards do not permit, with two exceptions, of their employing men who are better trained to supervise their technical services than the present factota, the "Palad Sukhabhipal" or Sanitary Board Députies. Unless and until this can be attained, and qualified sanitary engineers and architects appointed in all the interior towns of any size, the advice and assistance of the central Engineering Division is indispensable. But even with the realisation of this ideal, the essential function of this division yet remains, namely the supervision of local sanitary schemes in order to guarantee that their standards do not fall below what may be considered from time to time as the national permissible minimum. The urgent problems of town-planning and building regulation as well as the equally desirable provisions for regional planning and better housing cannot be approached without some such central technical organization which must work in close touch with its sister divisions dealing directly with local finance and preventive medical matters.

Fully to understand the somewhat complicated working of the administrative health machinery of the Metropolitan Area, it must be recalled that its general administration is under the Lord Prefect, who is an official of the Ministry of the Interior. The Area is divided into Inner and Outer Districts, the distinction being based upon greater specialization in the functions of the Police and the District Officers in the former, which also form the Registration Area and are designated for health and epidemiological purposes as "the City." The latter are administered in practically all respects like the districts of the interior. Lying within the Inner Districts, and only on the east side of the Chao Phya River is the Bangkok Sanitary Area. It is not administered in health and medical matters by a Sanitary Board as in the case of an interior Urban Sanitary Area but, at the present time, by two *central* government departments, namely the Department of Public Health and Department of Municipal Affairs, both under the jurisdiction of the Minister of the Interior.

Among the functions of the Department of Municipal Affairs are the general public works of the Capital and, in particular, the responsibility for conservancy, control of nightsoil disposal and operation of the waterworks of Bangkok; under the supervision of the City Engineer—Adviser of the Department. In this connection it may be mentioned that the water supply of Bangkok is taken from the river above the City, precipitated, filtered and chlorinated. It is regularly examined bacteriologically and chemically, is consistently of a high standard, and has undoubtedly had a notable effect upon the health of the inhabitants.

The Medical Officer of Health of Bangkok, for the time being under the central health department as aforesaid, works in affiliation with the District Officers, the City Engineer and the Commissioner of Police. His division is in charge of sanitary inspection, vital statistics in the Registration Area, control of infectious diseases and the Infectious Diseases Hospital, the Central Hospital, the Health Centres of the Government and medical service of the prisons within the City.

The institution of Health Centres is one of the recent activities of the Department of Public Health; ten of these, to cover the

Registration Area of the City, have been planned, of which six are already functioning. Briefly they exercise general health and sanitary supervision over the districts, including the investigation of causes of death, the checking of birth registration and vaccination. There is an out-patient clinic at each of the centres and public health nurse-midwives are attached to the staff, special attention being given to maternal and infant welfare. The Bang-rak Health Centre is organized and recently rebuilt as an up-to-date clinic for the treatment and prophylaxis of venereal diseases. In a measure all these centres are devoted to health education and propaganda.

Another branch of the Ministry of the Interior, the duties of which have direct bearing upon the public health status of the Kingdom, is the Immigration Department. One of the functions of the Ministry under the provisions of the Immigration Law is the medical examination of all those who enter the country for the purpose of intercepting all active cases of lunacy, leprosy, tuberculosis, syphilis and trachoma. The question of entrusting to the Department of Public Health the general and technical supervision of the full-time Medical Officers who carry out this inspection at some of the seaports and other points of entry is under consideration with a view of improving the standard of the work of these highly responsible officials. All the part-time Immigration Medical Officers are regular members of the public health staff.

The staffs of the central divisions of the Department consist of 162 officials and employees of various grades.

The Hospital for Mental Diseases and the Vajira Hospital employ 112 officials and others of whom 8 are physicians.

The staff of the Medical Officers of Health of Bangkok consists of 195 officials and other employees and includes 31 medical officers.

The field staff of the Department, permanently posted in the interior, number 127 medical officers who are assigned as Circle Health Officers in the 14 Circles, as Provincial Health Officers in 45 of the 79 Provinces and as Local Medical Officers in 61 of the more important Districts. It also includes 173 other employees consisting of nurse-midwives, sanitary inspectors, clerks and other assistants.

Thus the roll of the Central Health Organization includes, besides the Director General, 191 health and medical officers, 5 engineers and architects and 566 other employees, making a total of 769. If to these are added the 15 full-time Immigration Medical Officers, the grand total is 784.

Indirectly under the general and directly under the technical supervision of the Department are 28 medical officers, 22 nurse-midwives and a number of local dispensary and hospital attendants, most of whom are employed by the Sanitary Boards.

Six officials hold public health degrees or certificates, all but one obtained through fellowships granted by the Rockefeller Foundation, and three of the engineers of the Department hold university degrees; these constitute a valuable nucleus which, it is hoped, may steadily increase. One hundred and twelve other medical men have had special training in the departmental course for health officers. One hundred and seventy sanitary inspectors have also taken the prescribed annual course organized by the Department. Under an existing scheme, three physicians and a statistician of the Department are receiving specialised training in America, while two departmental students are being trained abroad in engineering. By an amended scheme already submitted the Department hopes considerably to enlarge its present programme for the study in foreign countries of preventive and curative medicine as well as in sanitary or public health engineering, architecture, town-planning and other technical subjects connected with its duties.

#### **The Health Council.**

At the Conference of the League of Red Cross Societies held at Bangkok in 1922, the peace-time health programme of the Societies was formulated and a resolution was passed expressing the desirability of forming a national health council in each country for the purpose of bringing about co-operation among the different agencies interested in the advancement of public health. Notwithstanding the repeated efforts of the Siamese Red Cross Society towards this end and the active sympathy of the Department of Public Health, a formula could not be found for some time that would fulfil the aims of representation of real responsibilities on the one hand and of effectiveness on the other. At last

however a compromise was reached, and in April 1928 a Royal Decree was issued by virtue of which the National Health Council was instituted.

“The promotion and conservation of the health of the general population is an important duty of the Nation.” So declares the Decree. “Public health work and sanitation, medical service, the prevention and suppression of epidemic and other dangerous diseases, health nursing and health education as well as other allied activities are all means by which the public health is promoted. Although several state organizations and other agencies exist to carry on such work, their efforts are as yet independent of one another. The co-ordination of their work, the division of their duties so as to avoid unnecessary duplication and the concentration of their resources when necessary occasions arise would bring about greater beneficial results.”

The status of the National Health Council is that of a consultative and advisory body, and its resolutions, adopted at a general meeting, only become effective after the approval of the Minister in charge of public health. The members of the Council are appointed by the same Authority and, as at present constituted, they represent the Department of Public Health, the Army Medical Service, the Navy, the Ministry of Public Instruction, the Royal State Railways, the Siamese Red Cross Society, the International Health Board of the Rockefeller Foundation and the American Presbyterian Mission. As has been previously stated, the Director General of Public Health is ex-officio president of the Council and, as such, acts as its chairman at general meetings.

The duties of the Council, set forth in Section 5 of the Decree, consist of—

“(1) The co-ordination of the normal activities of the various state organizations and other agencies;

(2) The division of duties performed by the state organizations and other agencies so as to avoid wasteful or unjustifiable duplication;

(3) The preparation of schemes for preventing and suppressing epidemic diseases as well as for assigning duties to be co-operatively undertaken in the event of sudden outbreaks of epidemic diseases;

(4) The preparation of schemes for, and the division of duties in the work of preventing and combating certain dangerous diseases;

(5) The preparation of schemes for, and the division of duties in the work of relief on the occasions of public calamity resulting in injury or sickness, and

(6) The consideration and submission of opinion in respect of any matter appertaining to the public health as may be referred for advice by the Minister in charge of public health or the Director General of the Department of Public Health."

The Council possesses the power to call upon any person as a witness of fact or to give expert evidence; and due provision is made for its necessary expenses.

Since its inception the Council has held three sessions, and has deliberated upon such important questions as the desirability of the participation of Siam in the International Sanitary Convention of 1926, the site of the permanent quarantine station for the Port of Bangkok, the control of the preparation and sale of biological products, the organisation of a leper colony in the Province of Bhuket as well as many other matters submitted by the Department of Public Health. It has recently approved of a comprehensive scheme for dealing with the important problem of tuberculosis submitted by the Siamese Red Cross Society, and has under contemplation a proposal for revising the law which controls the spread of venereal diseases. Short as may be the time since it has come into existence, the Health Council has proved its utility beyond any reasonable doubt.

#### **The Economic and Financial Aspects of Public Health.**

The aphorism that "health is a purchasable commodity" contains a far-reaching truth as much for the individual as for the community. Regarded as a productive process the laws of increasing or decreasing returns operate in public health work as in an ordinary industrial undertaking. Space does not, however, permit of a detailed review of all the economic principles involved in this by far *the most effective method of creating the national wealth*, depending as it does upon the quasi-rent of biological fertility and recuperative power of the human race. A more relevant question is how we should determine the public outlay on health that

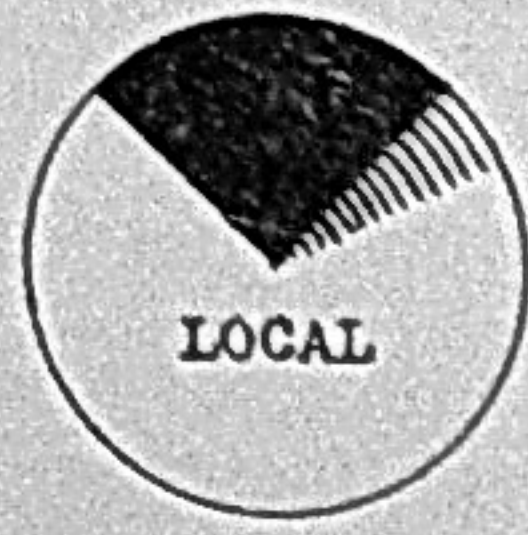
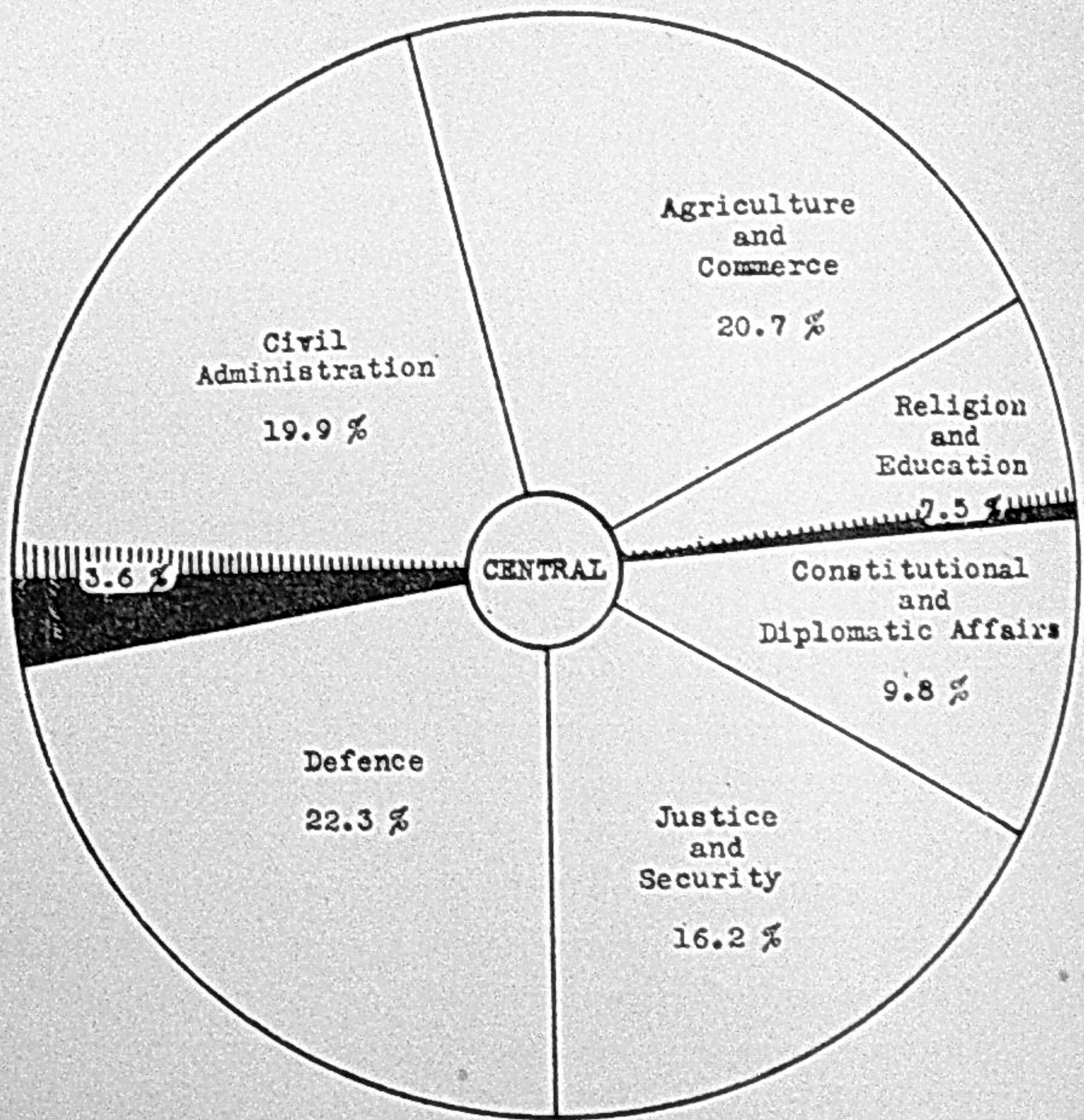
would be suitable to the need of the nation at this particular stage of its development. To consider first a broader issue, it is evident that the ratio of public expenditure, for the promotion of welfare and progress in civilisation of the community, to that for its protection against aggression and internal disturbance, is hardly capable of being simply determined by any economic or financial theory. It must also be decided by general expediency. But, at least as far as public health in Siam is concerned, there exists another criterion. Experience has amply proved that there is a fairly broad *margin of economical expenditure* which limits the minimum below which it is unwise to go, and the maximum above which public expenditure becomes undoubted extravagance. This margin is again determined by certain well-known and finite factors.

The one most worthy of attention among these to-day is the *personal factor* with regard to the small number of adequately trained men for either the public health or medical service; a factor which is relatively fixed in point of time. The factor of *knowledge* is practically unlimited as far as the supply of information contained in "the highly developed basic sciences of public health" and the accumulated experience of other nations are concerned; but here again it is considerably bound by the attitude of people, especially of the older generation, toward the application of the science of preventive medicine in actual life. Here again time and education, especially of the young, will undoubtedly enlarge this boundary. Education by itself will achieve much, but it must be supplemented by the judicious use of power. "Problems brought about by modern conditions, increased density of urban population, travel and commerce with the increasingly large interests liable to be affected by any change are multiplying more rapidly,"—in the opinion of Dr. Ira Ayer, the former Adviser of the Department of Public Health; and this cannot be dealt with in the absence of adequate *legislation*, which is the third and last factor of no less importance than the two above mentioned.

The appended circular diagrams of common scale showing the relative proportions of the estimated main items of expenditure of the Central Government and the total expenditure of the Sanitary Boards, which are therein designated as "Local," indicate

the relative positions of direct as well as indirect but obvious public expenditures on health and medical service.

DIAGRAMS OF PUBLIC EXPENDITURES  
 SHOWING THE SHARE ALLOTTED TO PUBLIC HEALTH  
 AND MEDICAL SERVICE



Legends:

- Direct Public Health and Medical Service Expenditure.
- ▨ Indirect Public Health and Medical Service Expenditure.



In even thousands the total estimate of the Department of Public Health for the present year, B. E. 2473, amounts to 1,476,000 baht (£129,150) of which less than fifty per cent. is assigned to salaries and the balance to general expenditures. This is equivalent to an annual expenditure of about 12.8 satang or just over 2½ pence per capita of the population. If to this is added 1,023,000 baht, being B. 20,760 estimated for the Medical Council, B. 280,000 Government contribution to the Red Cross Society, B. 722,240 for the Medical Services of the Army and Navy—but not including the expenditures of the Medical Faculty of the Chulalongkorn University and the School Health Division of the Ministry of Public Instruction, the appropriation for which being separately indicated in the sector representing Religion and Education—the total annual expenditures of the Central Government, *directly* appropriated for public health and medical service, amounts to about 2,499,500 baht or £ 218,700. In estimating the *indirect* health and medical expenditures of the Central Authority it is necessary to make due allowance for the work of the Police, Harbour Authority, the Municipal, Public Prosecution, Prisons and Immigration Departments as well as for the appertaining activities of the Local Authorities in so far as these are centrally financed. Likewise a due share of the Siamese contribution to the League of Nations should not be omitted in view of the part played by the Health Section of the League and its Eastern Bureau in international health matters. All this brings the estimated total amount, in round figures, to 850,000 baht, thus making a grand total of about 3,349,500 baht or £ 293,080 a year.

The twenty-six provincial Sanitary Boards, out of a total income of approximately 567,000 baht and a total expenditure of some 440,000 baht, apportion about one quarter of this amount to public health and medical service, say £ 10,000, or 4.23 per cent. of the central disbursement for the same purpose. This brings out in quantitative contrast the centralized condition of public health finance.

From these data it is possible to make a rough estimate of the total public expenditure on health and medical service which works out at a little more than 30 satang or just over 6 pence per capita of the present population.

This is of course a very small amount of money as compared with most countries and there is much need for increased appropriation for certain purposes. But in making comparisons it is well to remember the limiting factors already indicated.

#### Public Health and Medical Legislation.

Following the not altogether unusual course in countries where progressive changes are taking place, health legislation lags behind the requirements of the health authorities. This is due partly to a natural conservatism and possibly to some question as to the expediency of legislating beyond the understanding of the people. Concerning this the views of the Department of Public Health were expressed in an early report as follows:—"Health education and law ought to work together. If the law is too far in advance of the education of the people it will be more or less ineffective. If the Government delays the promulgation of a law until the education of the people leads them to demand it, advance will be unduly delayed and the people will suffer accordingly." Of course, laws that cannot be enforced are worse than useless, but it is also true that honest attempts to enforce suitable laws have in themselves an educational value which might with advantage be more generally recognised. Until recently the population of Siam has been essentially rural, and people have not yet become accustomed to the idea that increased centres of population and social organization may require some additional restriction of individual freedom for the benefit of the whole.

As public health legislation is fundamental, the principal laws now in force are tabulated below. From the historical point of view the list is not altogether without interest.

#### Summary of More Important Public Health and Medical Laws.

Year	Short Title	Application	Brief Summary
R. S. 116 (1897)	Local Sanitation Enactment <sup>1</sup>	Bangkok	Sanitary improvement and amenity in the Capital. Appointment of Medical Officer of Health and Sanitary Engineer. Certain duties and powers with reference to conservancy, night-soil, nuisances and control of buildings (certain sanitary and building clauses deferred).

## Summary of More Important Public Health and Medical Laws (ctd.).

Year	Short Title	Application	Brief Summary
R. S. 117 (1898)	Regulations and subsequent orders <sup>1</sup>	Bangkok	Removal of certain offensive trades and special nuisances.
R. S. 119 (1900)	Prevention of Cattle Diseases	do.	Medical inspection of cattle and certain sanitary measures. Dealing with cattle for slaughter and export, and for quarantine or destruction of infected cattle. Inspection of meat. Specification of location of cow stables.
R. S. 124 (1905)	Plague Notification <sup>2</sup>	do.	Notification of plague, or suspected plague by householders or attendants. Institution of isolation of cases and contacts. Disinfection.
R. S. 127 (1908)	Provincial Sanitary Organization <sup>1</sup>	27 towns and other communities	Creation of Sanitary Boards. Maintenance of cleanliness, prevention and treatment of disease, Roads, etc. Births, deaths and other statistics. Administration and organization, powers and duties of Sanitary Boards and officials.
R. S. 127 (1908)	Regulation of Prostitution and Prevention of Venereal Diseases <sup>3</sup>	General	Mostly police regulation of prostitution. Provisions for medical inspection.
R. S. 127 (1908)	Penal Code	do.	Certain articles concerning specified nuisances and infected foods.
R. S. 128 (1909)	Registration <sup>4</sup> etc.	do.	Census. Registration of births and deaths.
B. E. 2456 (1914)	Smallpox Prevention <sup>5</sup>	First Bangkok, later general	Compulsory vaccination or re-vaccination when required by ministerial order.
B. E. 2456 (1914)	Infectious Diseases <sup>6</sup>	Interior Provinces	Specification of plague, cholera, smallpox and cerebro-spinal meningitis as (epidemic) diseases. Disinfection, isolation, quarantine, evacuation with special provisions in case of plague and smallpox.

1. To be replaced by Municipal Law now in draft.
2. Similar notification decrees for cholera, smallpox and cerebro-spinal meningitis were issued in 1918, 1919 and 1923.
3. Revision or repeal now under consideration.
4. Revision applicable to Bangkok in 1917. Amendment now in draft.
5. Recently amended.
6. Revision applicable to the whole Kingdom now in draft.

**Summary of More Important Public Health and Medical Laws (ctd.).**

Year	Short Title	Application	Brief Summary
B. E. 2456 (1914)	Navigation in Siamese Waters <sup>7</sup>	Bangkok	Includes provisions for maritime quarantine.
B. E. 2456 (1914)	Local Administration <sup>8</sup>	Interior Provinces and outer Districts of Metropolitan Area	General Local Administration, powers and duties of officials. Remedy or removal of dangerous structures. Commune "medicos." Considers in a general manner sanitation, public safety, etc.
B. E. 2465 (1922)	Harmful Habit Forming Drugs <sup>9</sup>	General	Control of narcotic drugs under Government monopoly and licensing of retail dealers and physicians.
B. E. 2466 (1923)	Medical Law <sup>10</sup>	Metropolitan Area (being extended to provinces)	Institution of Medical Council. Registration of practitioners of all classes. Regulations may provide for limited practice.
B. E. 2470 (1927)	Immigration Law	General	Regulation of immigration. Medical examination and interception of active cases of lunacy, leprosy, tuberculosis, venereal diseases and trachoma.
B. E. 2470 (1928)	Skimmed Milk <sup>11</sup>	do.	Prohibition of the importation and sale of skimmed milk.
B. E. 2471 (1928)	Health Council	do.	Institution of National Health Council-Constitution-Duties and powers to call witness.
B. E. 2472 (1929)	Medical Amendment	Metropolitan Area (being extended to provinces)	Institution of Medical Council. Registration of practitioners of all classes. Regulations for restricted practice.
B. E. 2472 (1929)	Smallpox Prevention Amendment	Metropolitan Area and 9 Circles	Regulation of vaccination certificates.

7. Revision now in draft.

8. do.

9. Amendment now in draft.

10. Amended.

11. Amendment under consideration.

**Popular Health Education.**

The first annual report of the Medical Department of the Ministry of the Interior for the year B. E. 2458 (1915-1916) contained an appendix in which a fairly complete programme of

popular health education was outlined. As a matter of "historical" interest, its gist may be given here in a few sentences.

After giving general reasons for this universally recognised activity of a health organization it went on to propose four different means of health education. These are (1) *the human means* which it considered by far the best, and emphasised the point with the epigram that the patient believes more in his physician than in what his physician believes. But as good teachers of grown up people are rare among the non-professional laity, it recommended (2) health teaching *by means of the schools*. It should be mentioned in digression here that the monasteries of Siam have been in the past and, at least as far as the interior is concerned, still are important sources of education, not excepting that respecting health and sanitation. The report in question instanced (3) various *mechanical means* employed in other countries such as picture posters, models, exhibitions and the cinematograph which were considered as especially suitable for the illiterate majority; and for those who can read it advocated the *means of literature*—hand-bills, pamphlets and books which should be simply written and liberally illustrated. It finally hinted that health education should not be confined only to the common people, but that those in authority should be tactfully included. It remains to add that all this was considered very radical *at the time*.

There is a far cry from those days, fifteen years ago, to the present, with an actual governmental Division of Health Education. The Department of Public Health has often asserted, in view of the circumstances existing in this country, "that instead of being one of the later activities of the health authority as has frequently been the case, health education should be one of the first." It may be said that the Department has lived up to this principle. There is evidence in the changing attitude of people of all classes that it is bearing fruit, and in this connection the work of the Red Cross Society and the International Health Division has deserved a full measure of praise.

The Division of Health Education now possesses 4 cinemato-

graphic projection outfits, photographic and cinematographic cameras, a number of stereopticons and "attract-o-scopes," over 1,000 lantern slides and a repertory of 60 films, 16 of which are permanently loaned from the Red Cross Society. An anti-cholera film entitled "What You Eat" and a lengthy melodrama concerning malaria called "The Mosquito is more deadly than the Tiger" are original productions organized by the division itself.

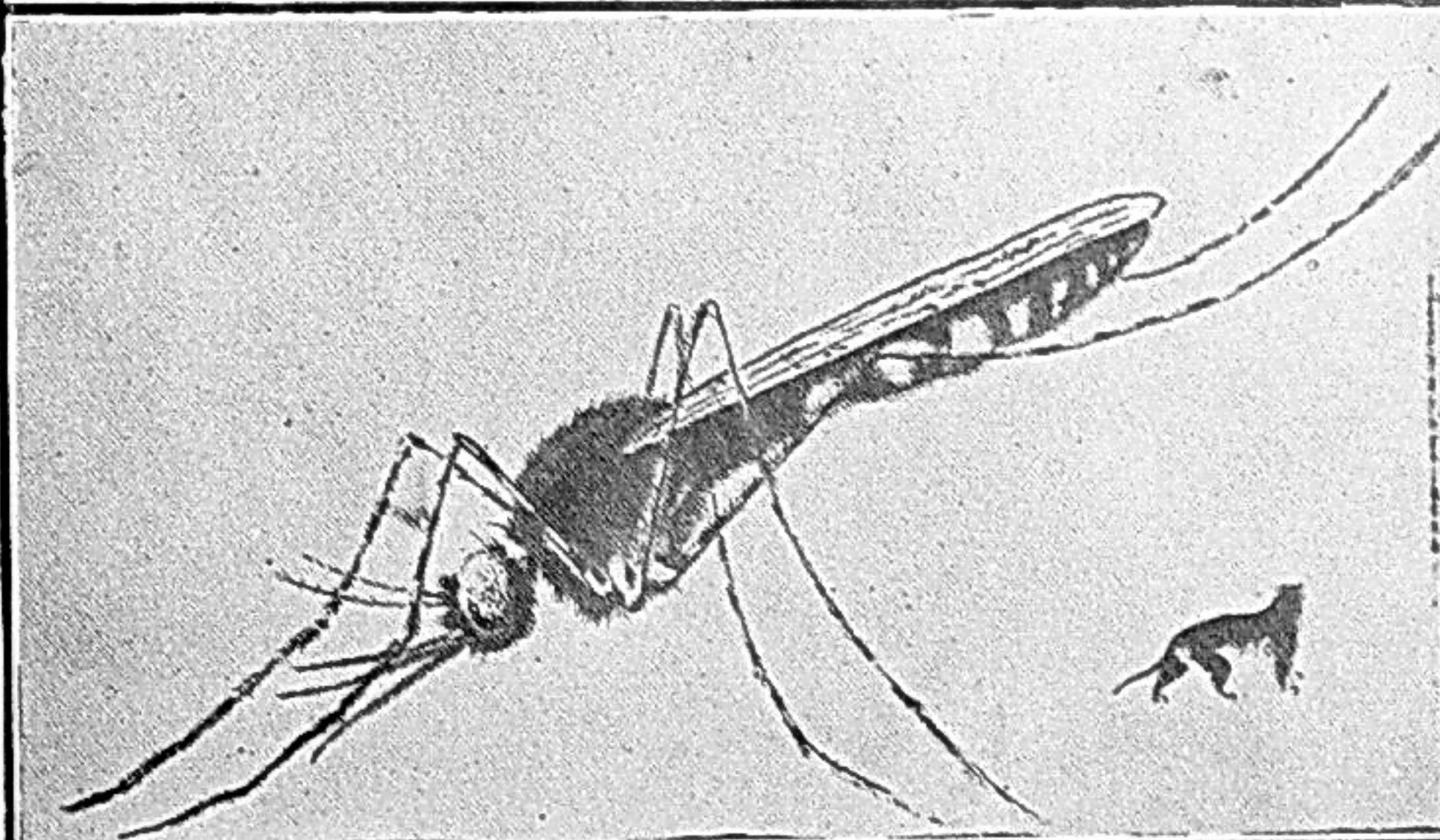
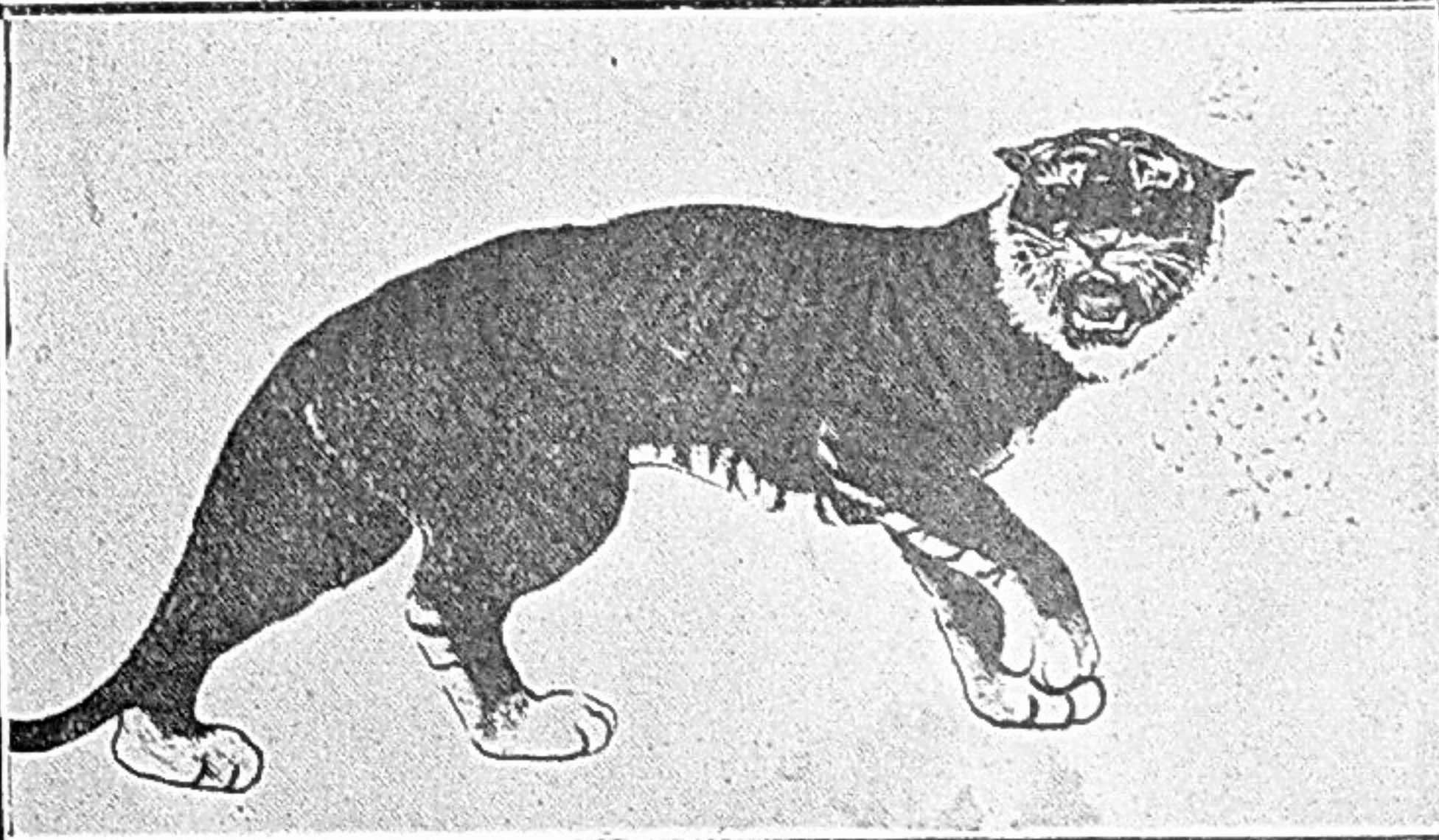
Both the Department of Public Health and the Red Cross Society have published a great amount of health literature and have been associated in public health exhibitions. The setting up of exhibits at all the important fairs and pilgrimages throughout the Kingdom has become a routine.

The Department has an editorial staff by means of which a monthly Public Health Bulletin is published. Starting six years ago with 500 copies of some 50 pages, it has increased to 1,700 copies of 150 pages owing to the increased demand. General reports of the Department are annually published in Siamese, and abridged editions in English are occasionally issued for the benefit of foreigners. There are in actual use 60 different pamphlets, 36 picture posters; and on occasions tens of thousands of handbills, cards and coupons are circulated. Competition prizes and even matches faced with a health suggestion such as "Get vaccinated against Cholera to-day," have been employed with good results.

Although not directly for popular use, there is a good working library of the Department containing over 2,000 volumes. It receives many of the important health and medical periodicals and is also on an exchange list with foreign health organizations. From this mine of information the Editorial Staff collects the materials for its work which of course includes local and topical matters.

In its pedagogics the Department always insists upon what may be called "The Three S's" of popular health education. These are *simplicity*, *specificity* and *suggestiveness*. It prefers to rely more upon the last than upon any argumentative reasoning which is difficult to adapt for the purpose of propaganda, being a method of imparting knowledge considered to be more suitable for general

ยุงร้ายกว่าเสือตั้งพันเท่า



ในกรุงสยาม เสือกัดคนตายปีละ ๕๐ คน  
ยุงกัดคนเป็นไข้ตายปีละ ๕๐,๐๐๐ คน

A Public Health Poster.

Top — The Mosquito is a Thousand Times more deadly than the Tiger !

Bottom — In Siam, Tigers kill fifty persons a year, and Mosquitoes cause fifty thousand deaths annually.

education for the intelligentsia than for the man-in-the-street. It also bears in mind the essential order of effectiveness, namely first comes *quality*, second *economy* and third *quantity*.

#### The Population and Vital Statistics.

The last census of the Kingdom was taken in July of the year 1929, yielding a total population of 11,506,207 persons. The total rate of increase per annum for the last ten years worked out at 22.45 per thousand. According to the computation of the Department of Public Health based upon the figures of this and the preceding census the natural rate of increase, that is, excess of births over deaths, after making due allowance for immigration, is at the rate of 18.96 per thousand. The following table gives the relative rates of 23 countries:—

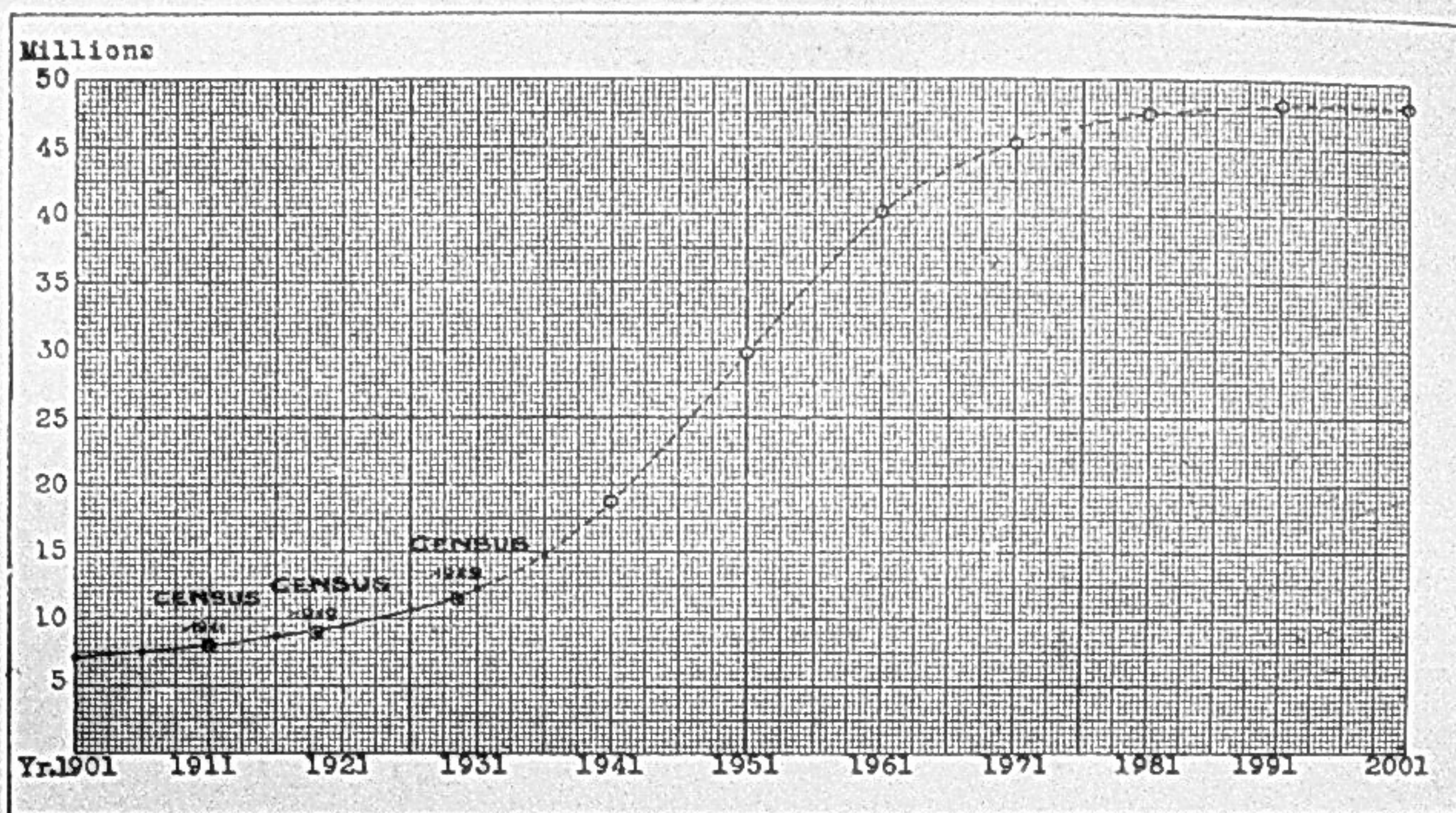
Order of Magnitude.	Countries	Based on	Rate per 1000	Source
1	Soviet Russia	1924-25	19.4	L'Annuaire Statistique, 1928.
2	<i>Siam</i>	1919-29	18.96	Statistical Yearbook of Siam, 1928-29, and the report of the Department of Public Health.
3	Argentine	1923-25	18.4	L'Annuaire Statistique, 1928.
4	Formosa	1922-24	18.1	do.
5	Egypt	1924-26	17.9	do.
6	Bulgaria	1923-25	17.7	do.
7	Netherlands	1924-26	14.6	do.
8	Roumania	1923-25	14.2	do.
9	Philippines	1923-25	13.4	do.
10	Japan	1923-25	13.1	do.
11	Portugal	1921-23	12.1	do.
12	Ceylon	1923-25	11.9	do.
13	Italy	1924-26	11.0	do.
14	Spain	1924-26	10.2	do.
15	United States	1923-25	10.1	do.
16	Denmark	1924-26	9.8	do.
17	Burma	1911-21	8.7	Burma Admin. Report, 1921-22.
18	Germany	1924-26	8.3	L'Annuaire Statistique, 1928.
19	British India	1923-25	7.9	do.
20	Belgium	1924-26	6.6	do.
21	Greece	1921-22	6.5	do.
22	England-Wales	1924-26	6.3	do.
23	France	1924-26	1.5	do.

It will be seen that the rate of natural increase of the Siamese population is second only to that of Soviet Russia.

If the estimated population according to a table given in the



Statistical Year Book of the Kingdom of Siam B. E. 2471 (1928-29) which covers a period of 28 years, is plotted out, it will be seen, as in the following graph, that the plottings exactly fit the lower part of the tracing of the typical "logistic curve" which indicates an asymptote in the neighbourhood of 48,000,000 in about six or seven decades.



This is a much greater rate of growth than will result from the formula  $\log P_n - \log P_c = n \log 1 + r$  employed for an inter-census rate by geometrical progression and may be, of course, only an interesting speculation of a future *possibility* based upon the assumption of a continuity of the present "cycle of growth." The present density of the population is 301 per square kilometre in the Metropolitan Area, which is by far the most thickly populated, and only 14 per square kilometre in the least populated Circle of Chandapuri; while the average for the whole Kingdom is 22. A population of 48,000,000 would be equivalent to an average density of 93 per square kilometre, which is by no means an absurdity, provided always that an adequate increase of wealth will at the same time support the population in a condition approximating the optimum for the country. In this connection the Speech from the Throne with reference to the last census gave timely warning of the underlying danger of such a rapid growth without at least a parallel increase in the means of subsistence. His

Majesty the King therefore urged upon the nation the necessity of earnest application to the development of both commerce and industry. The causes contributing to this accelerated natural increase of the last decade also furnish another interesting matter for speculation to which the Royal Speech also alluded. Whatever they may be, the principal task of the Health Authority is clear, and that is, so to improve environmental conditions that the present and future population of this country, whatever its number, will thereby be so benefited "that the waste of living may fall to its least, and the wealth of living may increase to the uttermost."

\* \* \*

In giving a short account of the vital statistics of the Kingdom it should be admitted in the first place that the accuracy of original returns, especially those from outside the Registration Area of Bangkok, are subject to question, and that they tend to affect the values of rates which are thus only calculated to the nearest integer.

Since 1926 the Department of Public Health has been made responsible for the general collation of statistics of births and deaths, hitherto handled by the Division of Registration of the Administration Department of the Ministry of the Interior.

Some typical statistical data are given in the following tables. The year of the Buddhist Era is from the 1st of April to the 31st of March.

**Some Typical Population Statistics (Census of 1929).**

Areas	Population	Males	Females	Density of population per sq. km.
Whole Kingdom	11,566,207	5,795,065	5,711,142	22
All Interior Circles	10,584,590	5,296,170	5,288,420	20
Metropolitan Area	921,617	498,895	422,722	30
Registration Area, Bangkok	489,488	275,530	213,958	5,152
Most populous Circle (Nagor Rajsima)	2,822,710	1,374,746	1,447,964	30
Least populous Circle (Chandapuri)	169,626	86,605	83,021	14

The largest Sanitary Area in the interior contains an estimated population of 16,870. The smallest contains 1,047.

The Population by nationality in the Registration Area of Bangkok, according to the last census, is as follows:—

Nationalities	Males	Females	Total
Siamese .. .. .	131,570	135,681	267,251
Chinese .. .. .	132,526	69,586	202,112
Europeans .. .. .	743	502	1,245
Indians .. .. .	9,819	7,630	17,449
Americans .. .. .	35	39	74
Burmese .. .. .	295	187	482
Japanese .. .. .	132	81	213
Cambodians .. .. .	389	231	620
Others .. .. .	21	21	42
Total .. .. .	275,530	213,958	489,488

**Births and deaths reported in the whole Kingdom  
for the years 1921-1930.**

Year ending March 31st	Births			Birth rate per 1000	Deaths			Death rate per 1000
	Males	Females	Total		Males	Females	Total	
1921	129,783	120,164	249,947	26	84,350	72,751	157,101	17
1922	133,744	124,348	258,092	27	83,697	70,928	154,625	16
1923	143,950	133,959	277,909	28	86,687	73,048	159,735	16
1924	152,563	141,387	293,950	29	85,628	73,106	158,734	16
1925	150,265	139,075	289,340	28	86,150	72,727	158,877	15
1926	163,204	150,162	313,366	30	83,678	68,994	152,672	14
1927	159,029	145,732	304,761	28	96,209	82,342	178,551	17
1928	171,031	156,907	327,938	30	85,788	70,952	156,740	14
1929	179,602	163,473	343,075	30	96,662	80,996	177,658	16
1930	187,544	171,628	359,172	31	99,981	85,440	185,421	16

**Births and deaths in the Registration Area of Bangkok  
for the years 1927-1930.**

Year ending March 31st	Births	Deaths	Birth rate per 1000	Death rate per 1000	Infant mortality (under 1 year)	Infant death rate per 1000 births
1927	13,407	14,464	27	29	3,517	262
1928	14,476	11,579	26	21	3,025	209
1929	17,096	12,523	29	22	3,421	200
1930	16,853	13,341	34	27	3,804	226

The infant death rate (per 1000 births) in the Registration Area of Bangkok, for the year ending March 31st, 1930, was 226. The average for ten years ending March 31st, 1930, was 234.

**Deaths from violence and accidents for the whole Kingdom.**

Year ending March 31st	Drowning	Venomous bites and stings	Wild animals including tigers and crocodiles	Domestic animals including elephants	Other causes	Total
1930	986	208	28	89	2,360	3,671
Average for 5 years (1926-1930)	827	143	38	81	1,749	2,837

A statistical résumé of complete hookworm control and sanitation work accomplished by the International Health Board in co-operation with the Royal Siamese Government from 1917 to 31st March 1929 (inclusive of 3 years under the immediate auspices of the Siamese Red Cross Society) are tabulated below:—

**TREATMENTS, first**

For intestinal parasites, in general	...	1,766,274
For hookworm disease	... ..	1,307,152
<b>STOOL ANALYZED FOR INTESTINAL PARASITES</b>		<b>722,453</b>
Positive for Hookworm	... ..	65.18%
Positive for Ascaris	... ..	24.07%
Positive for Trichuris	... ..	9.22%
Positive for Strongyloides	... ..	0.21%
Positive for Oxyuris	... ..	1.04%
Positive for Taenia	... ..	4.23%
Positive for Others	... ..	3.13%
<b>LECTURES given, number</b>	... ..	<b>35,843</b>
Total estimated attendance	... ..	1,989,522
Estimated average attendance per lecture		56
<b>HEALTH LITERATURE distributed, pieces</b>	... ..	<b>467,082</b>
<b>INSPECTIONS:</b>		
New latrines	... ..	420,654
Old latrines	... ..	167,553

### **Communicable Diseases and Artificial Immunity.**

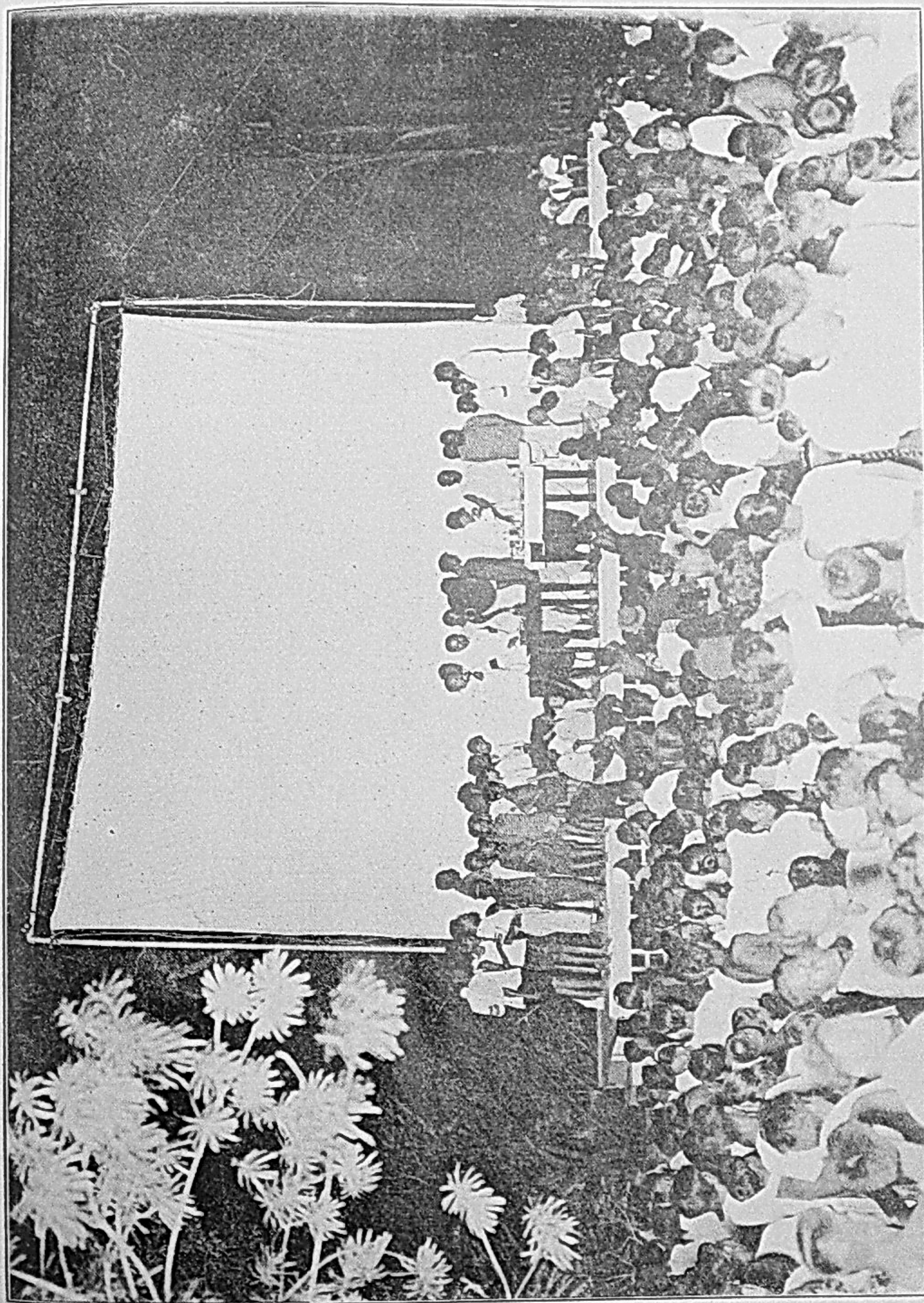
The following monograph on infectious and epidemic diseases, written by Dr. Ira Ayer, the former Adviser of the Department of Public Health, in 1926, is here reproduced with only a few additional remarks and slight modifications:—

“The Department forwards epidemiological and pertinent information to the Health Organization of the League of Nations, of which Siam is a member, and exchanges similar information by telegraph and radio with the Far Eastern Bureau of the League at Singapore. The work of the Bureau at Singapore is regarded as of great value, not only intending to standardize returns so that they are more easily comparable and in distributing information of practical value, but in bringing the different administrations into closer touch with one another and fostering a spirit of co-operation which should be of far reaching effect.

“The notifiable epidemic diseases are plague, smallpox, cholera and epidemic cerebro-spinal meningitis. Telegraphic reports of all cases of these diseases are required to be made to the Ministry of the Interior.

“Epidemic cerebro-spinal meningitis is not very prevalent and has been confined chiefly to prisons and barracks. It was first recorded in Bangkok in the report of the Medical Officer of Health for the year 1921.

“The first case of plague appears to have been noted in Bangkok in 1904, about ten years after the beginning of the present pandemic which, starting from the interior of China, has gradually involved in some degree nearly every country. The disease established itself in Bangkok and quickly spread to certain localities in the interior. Though by no means as serious as in certain other eastern countries it has become one of the endemic diseases of Siam. No documentary records are available for the earliest occurrences but some examples from unofficial sources of information may be of interest. The inland town of Korat, which was affected soon after plague was reported in Bangkok, was subject to almost yearly outbreaks; in 1906 a whole section of the town was burned in an attempt to eradicate the disease; in 1908 the number of daily cases is said to have reached a maximum of 35; in 1912, during a single dry season, over 800 people are said to have died.



Outdoor Public Health Cinema—anti-cholera inoculation  
being explained and demonstrated to crowd,

Departmental records for the interior provinces date from 1914. In the year 1917 during the course of a severe epidemic in which the population of this town of about 7,000 people was literally decimated, very thorough reconstructive work was carried out under the direct supervision of the Director of the Medical Department of the Ministry of the Interior; since then there have been only a few minor recurrences.

“An officer of the provincial gendarmerie, who was stationed at Korat, tells of the following interesting experience. One day he met a procession carrying a bier upon which lay a figure dressed like a corpse for burial. People beating drums headed the procession and others carrying lamps and torches flanked it on either side; it was followed by a huge crowd of excited people. The procession passed around the city walls and finally entered a temple, where offerings were made and the bier was left, the people believing that the plague spirits had been tricked into entering the figure and, this then being on holy ground, they could not get out to resume their evil work in the town. This is of interest as showing the attitude of some of the people not so many years ago, but now very different.

“A number of other places were early affected and show a somewhat similar history to that of Korat. In 1906 at Nagor Pathom over 300 persons are said to have died in a population of less than 3,000. The writer has seen instances where whole households have died within a few days. The death of two or three in a family of five or six has frequently occurred. Villages of over two thousand people have been deserted until the epizootic had killed most of the infected rats and the people could safely return. It says something for public health that such occurrences are now becoming infrequent.

“In the earlier outbreaks buildings or whole sections of infected towns were not infrequently burned. More recently, a large amount of alteration and reconstruction of buildings has been undertaken and, wherever this has been done, definite results in diminution or cessation of plague have been attained.” Loans of money were sometimes made to small property owners to expedite such improvements. “Unfortunately, in the absence of powers to enforce building regulations, insanitary conditions gradually recur.

"The health authorities have been able to concentrate upon the rat as the chief factor in plague because epidemic pneumonic plague is rare in Siam and bubonic plague is seldom"—if ever in this country—"directly spread by the sick individual. There is a seasonal tendency in plague, usually the months of January to March or April.

"Severe epidemics of cholera occurred long before departmental records were kept. The older residents will tell of regular processions of coffins in what is now the principal business street of Bangkok. These belong to a past generation, but still cholera is one of the most serious of the epidemic diseases with which the health authority has to deal.

"The first general cholera epidemic of which official records are available, began in February 1919 in a small town on the upper course of the River Ping near the Burmese frontier. Notwithstanding all that could be done the disease spread rapidly and during the next two years there occurred over 18,000 cases and 13,000 deaths. Although sporadic cholera is reported every year from different localities, there is a tendency to a periodicity of about six years in these extensive outbreaks.

"The recent epidemic began in Bangkok in October 1925 and again extended rapidly. By the end of September 1925, over 10,000 cases and 7,000 deaths had been reported in the interior provinces, and 3,000 cases and 1,800 deaths in Bangkok. Very active educational propaganda was carried on, posters were placed prominently throughout the city and in the provinces, information concerning precautions to be taken was disseminated by means of public lectures and in the cinema halls, many thousand leaflets were distributed. The effect of this propaganda was visible in the actions of a considerable number of the population.

"During a period of two months at the height of the epidemic and before the onset of the rains, the Department of Public Health distributed over 1,000,000 gallons of water at the rate of about 17,500 gallons per day to communities in the vicinity of Bangkok, which had not access to the city water supply. Medicine was freely distributed and 237,206 anti-cholera inoculations were performed.

"The Siamese Red Cross Society greatly assisted in this emer-



gency by making the strenuous effort needed to prepare at the Queen Sawabha Memorial Institute the exceptional quantity of vaccines required, and further showed its desire to be of the highest service by supplying these to the health authorities free of charge during the whole period of the epidemic.

"The Navy also gave valuable assistance by converting the naval hospital at Bangkok into an emergency cholera hospital, furnishing the full staff, equipment and medical supplies.

"One of the Royal Princes generously lent his former palace to the Department of Public Health for use as an emergency cholera hospital. By reason of location and arrangement this became the best emergency hospital established by the Department. Private firms and citizens also gave material assistance by lending motor cars and a large water boat to the Department.

"It is of interest to note that in these epidemics the disease has tended to be more serious and persistent in the great central valley and along the course of the larger rivers, and relatively much less severe in certain Circles where the people depend for their domestic water supplies upon deep wells. In both the last and preceding epidemics Bangkok had the advantage of the present water system which undoubtedly did much to lessen the severity of the disease in the city.

"Since then two smaller outbreaks of cholera have taken place, the only noteworthy feature of which being the extensive use of anti-cholera vaccination which has become popular in most parts of the infected areas and which undoubtedly checked their virulence even before the occurrence of heavy rainfall which has been often observed to have a very marked effect upon this disease.

"Smallpox is a definitely preventable disease but only at the price of continued watchfulness. Several years ago smallpox broke out in a small isolated southern fishing community. For various reasons, the outbreak got out of hand before the Ministry was informed of the true conditions and the disease spread to other places on the coast. The central health department then took charge and the epidemic was promptly checked, but the conditions in the localities first affected were evidence that, left to itself, smallpox could still disorganize the life of communities

in this country. Their activities were practically suspended, people marked by the disease were seen everywhere and, though the epidemic was beginning to burn itself out, persons in the active stages of the disease were widely scattered in the villages. In the face of this disaster there was a pitiful feeling of helplessness among these people until they appreciated the assistance which the health authorities were able to give them.

“On the whole the Government may properly feel some gratification regarding this disease as not only is the population becoming fairly well protected by continued vaccination but by intensive vaccination in the event of an outbreak a number of threatening epidemics have been brought under control.

“The ‘conscientious objector’ is fortunately not prevalent in this country.”

The first of the following tables gives the records of free vaccination made by the staff of the Department and special vaccinators who are remunerated at a varying rate up to a maximum of 10 satangs per vaccination. The second table represents vaccination in the Registration Area of Bangkok.

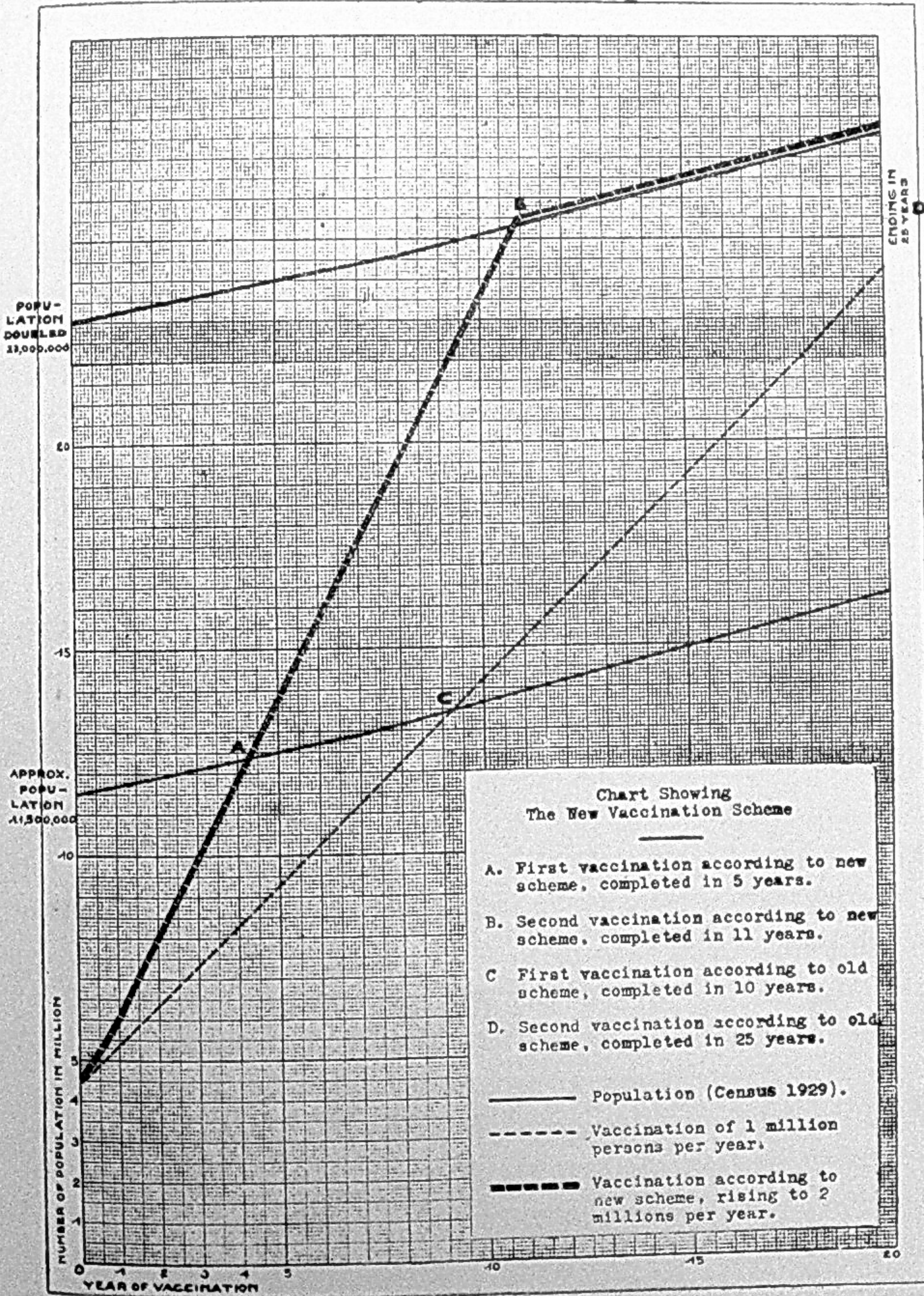
#### Interior Provinces.

Year ending March 31st	Number vaccinated	Per cent Successful
1918	514,198	92
1919	225,765	92
1920	192,490	83
1921	264,456	89
1922	460,195	92
1923	539,781	87
1924	992,662	83
1925	757,639	77
1926	1,047,740	79
1927	1,086,337	67
1928	1,076,235	71
1929	1,029,991	63
1930	1,617,249	69

#### Registration Area of Bangkok.

Year ending March 31st	Number vaccinated	Per cent Successful
1927	28,222	42
1928	22,880	53
1929	18,179	59
1930	37,461	46

The Department of Public Health is now organizing vaccination against smallpox under an eleven-year scheme, which aims at an annual increase of the number of vaccinations up to the maximum of 2,000,000 which it intends to maintain for a number of years. The appended chart which illustrates the scheme is self-explanatory.



"Siam did not escape the great pandemic of influenza. It appeared in Bangkok in the month of October 1919 and spread from point to point over the whole country. The type was somewhat less severe than in many other places but over 80,000 deaths were reported as due to influenza during the six months of prevalence, in many places business was at a stand-still and even the government offices were closed.

"Year in and year out malaria justifies its characterization by Osler as the greatest single destroyer of the human race. When one has once seen a fever stricken village with more than half the population sick, with perhaps a death in nearly every household, it makes an impression not easily forgotten. Between 40,000 and 50,000 deaths from malaria have been reported in a single year. The question of dealing with malaria is of course constantly before the health authorities; quinine is distributed in increasing quantity but, owing to its extent and complexity, the malarial problem of Siam is yet far from practical solution." It is a worthy matter of note that the Speech from the Throne, already referred to, made special comments upon this serious national problem, and indications are not wanting that immediate steps will be taken to study the specific local vectors.

"Dysentery is prevalent throughout the country. The amoebic form is a frequent cause of disability among foreigners, and it is likely that eating uncooked salads and garnished foods is one of the chief causes of this. During the epidemic of cholera such foods were not served in any of the hotels of the Royal State Railways, an example which is believed to be worthy of imitation.

"Hookworm and intestinal parasites are prevalent and widely spread. Owing to the activities of the Sanitary Campaign data concerning these diseases are more complete than for any others except the four notifiable epidemic diseases. Of variable intensity in different parts of the country, they are generally a good index of sanitary conditions and because of the facility with which they can be demonstrated and cured are largely utilized in connection with educational propaganda for improvement of the public health."

Pneumonia as well as some of the characteristic tropical diseases also require consideration. "Other diseases are," however, "notable for their absence or comparative rarity. Among these may be mentioned typhus fever, the relapsing fevers, certain diseases caused by flukes such as schistosomiasis, kala azar, human trypanosomiasis (African sleeping sickness), Malta fever, pellagra, diphtheria, scarlet fever and others. Yellow fever has fortunately never been brought into the Far East. Apparently one has to thank distance for this and there has been some apprehension on the part of eastern health authorities that with greatly increased facilities of communication the disease might be introduced. The extent of such a disaster in eastern conditions and a virgin field can only be guessed. But the Rockefeller Foundation, in its successful attempt to control yellow fever in its American strongholds and its undertaking to do a similar service for the west coast of Africa is performing a world service which will probably prevent such possibilities from becoming realities." A recent resolution of the Advisory Council of the Far Eastern Bureau of the League of Nations, advising control of experiments with the virus of yellow fever in the East, is receiving the earnest attention of the Siamese Health Authorities.

The following tables furnish data concerning notifiable diseases respectively for the whole Kingdom and for the Registration Area of Bangkok.



The Health Officials' Badge.



EPIDEMIC DISEASES

Notified in the Registration Area of Bangkok, during the year ending 31st March 1930 and the 3 preceding years.

Diseases	1927	1928	1929	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total
Plague																
C.	11	9	7	—	1	—	1	3	1	—	—	1	—	—	5	12
D.	10	8	6	—	1	—	1	3	1	—	—	1	—	—	5	12
Cholera																
C.	2297	364	356	94	159	30	7	10	9	1	2	6	9	2	1	330
D.	1229	220	199	66	89	13	1	4	3	—	—	2	—	—	—	178
Smallpox																
C.	267	29	2	—	1	—	5	1	—	—	—	1	—	—	—	8
D.	163	15	—	—	—	—	—	—	—	—	—	—	—	—	—	1
C. S. Meningitis																
C.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
D.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

#### Other Social-Hygienic Problems.

The former Adviser of the Department had the following remarks to make concerning the question of infant and maternal welfare: "Though the infant death rate is not as high as in some of the more densely populated eastern countries, it is estimated that approximately one third of the babies die during their first year. This is considerably more than three times the infant mortality rate of the more advanced western nations and is not only an enormous waste of human life but a true economic loss to a country which is far from having reached its optimum population. The best information available also shows a high maternal mortality. But...*advance must necessarily be gradual.*" The reason for these italics will presently appear. "The health authorities are further hampered by the difficulty of obtaining accurate statistical information,"—as the obvious gap between the rate of natural increase and the differences between the rates of reported births and deaths, tabulated under a previous heading, fully confirms—"nevertheless the experience gained...is on the whole encouraging and some measurable progress is recorded. In any case the *potential value* of such work can hardly be over-estimated." This is all perfectly true, but there is yet more to be said. It is a well known fact among health authorities and especially those who are pioneer workers in a relatively new field, such as the eminent authority, Sir George Newman, that the first stage in the reduction of infant mortality from such high rates the Adviser had in mind, to a more moderate one, of say fifteen per cent., is a relatively simple task as compared with such efforts as are being directed in Western Europe against the odds of decreasing returns when the percentage is approaching the first digit. Is it not then the bounden duty of the health authorities to mobilise all available forces, even at the risk of abandoning other actions and pit the entire strength for this easy victory? Such indeed was almost the opinion of the writer until he was asked a very simple question by *another* eminent authority who should in this case remain unnamed. It was—"Are you sure your people have enough to support twice as many children?"



Natural affection may move a mountain but it cannot change the law of cause and effect. "Advance in this direction" then, "must necessarily be gradual" and *circumspect*.

The allied problem of maternal mortality, however, deserves undivided and whole-hearted attention. In this connection, reference should be made to the existing arrangement at the Vajira Hospital for the training of uncertified midwives by taking them into residence for a course of a few months duration, and giving them practical instruction which will enable them to conduct normal cases safely after they have returned to their homes and occupation. The first course is being started, and should the result prove satisfactory, similar training courses will be organized in the provincial hospitals having a maternity service. This should be considered as in the nature of an experiment, and if the outcome justifies expectation, the serious problems of disease and suffering inflicted upon Siamese motherhood through the ignorance of the majority of self-appointed midwives will be on the way to practical solution, pending a sufficient supply of fully qualified nurse-midwives in the probably distant future. The Red Cross Society and other agencies are also at work in this unquestionably most worthy cause.

His Royal Highness the late Prince Mahidol, C. P. H., M. D. *cum laude* (Harvard), was keenly interested in the problem of tuberculosis in Siam as he was in other social-hygienic as well as educational problems of the country, and contributed the first important pamphlet for popular use, now one of the departmental series, as early as 1919—the reader will have noted that the public health movement in Siam is only adolescent. While the writer was preparing to attend the International Conference on Tuberculosis at Rome in September 1928, the Prince wrote him a letter containing the following characteristic suggestion:—"When you are in England it might be interesting if you could meet Dr. Varrier-Jones who is in charge of the Tb. Colony at Cambridge. Dr. V.-J. came out with the statement the other day that sanatorium treatment is not as valuable as was thought on account of the poor sanitary environment to which the average patient has

to return on recovery or improvement." The writer went, saw and was impressed with this promising experiment. To the observing "layman" at least, the usual impressive hospitals, sanatoria and even the so-called "preventoria" are one and all "medical service in practice," not to mention the latest "pneumo-thorax" technique. This should not be taken as a sweeping disregard of the actual value of "hospitalization" in lessening the nuclei of infection—nor of the potential value of the B. C. G. of Calmette, but one should pause to contemplate the financial burden on the health budget that Siam can at present afford for the cost of housing, feeding with extra-nutritious food and attending expertly upon a number of urban and rural patients equal to, say, 5% of all the fatal cases of sickness in the Kingdom, to give but a conservative estimate. Only this relief to the cases that end in death would amount to something like half the entire central and local public expenditure on health and medical services of the nation. To allow for a marginal number of cases that would materially aid prevention, this again should at least be multiplied by five.

The almost analogous problem of leprosy is alike incapable of complete solution here by such a tactic of direct offensive. In passing, this may be said to be true not only of all social-hygienic questions but, with only a few fortunate exceptions, of all the social problems and even of crime itself, universally the most chronic of social ailments. The total annual cost of a frontal attack on leprosy by enforced—not to mention the more economical and therefore practical scheme of voluntary—segregation, will also amount to a trifle more or less than the present total public cost of health, depending upon the self-supporting economy of the institutions, or even, as was hinted at the beginning, of the properly instituted colonies. The leprosy financial ratio of approximately 1:3 of the Philippine public health estimate, considerably larger than that of Siam, is evidence of this high cost. The difference between these alternative schemes lies in the spontaneity of the colony plan as proved by the existing self-segregated leper villages of the north and eastern provinces. In discussing

the leper census, Dr. Ira Ayer wrote in 1926, "There are 10,000 to 20,000 cases in Siam.....Methods of dealing with this disease are under careful consideration, but the problem presented is one of extreme difficulty. There can be no question of prompt eradication and it will have to be dealt with step by step as further experience and resources become available."

What has been above written of tuberculosis and leprosy also holds good for the problem of venereal diseases, at least in so far as its sociological and administrative sides are concerned. Here however, in modern mathematical expression, the space-time attribute is almost vertical for the individual case, and steeply oblique for the community, especially when it is handicapped by *regulation*. The alternative of *abolition* is being considered here as well as by our neighbours, and in both cases are somewhat complicated by the local condition of urban sex inequality among the foreign inhabitants. If a forecast is justifiable, the result for Siam in the immediate future will be a compromise, for it is often impracticable to legislate against popular prejudice and conservatism—particularly perhaps, in the last category, when it carries the bâton of perambulating office, a phenomenon well known to all health reformers.

This naturally leads to those of the social-hygienic problems in which the hygienist comes out in his true quality as one who is entrusted with a share of the *police function of the state*. This is already seen in the obvious instance of immigration; it is more apparent still in the problem of mental diseases, which imperceptibly merges into that of the non-economic manifestations of crime. It is here that Siam owes a great debt of gratitude to the penetrating wisdom of her Royal Statesmen in entrusting to one Minister only the control of both the important Departments of Health and Police, often separated in governmental mechanism.

In dealing with both incurable crime and lunacy, *colonization* again offers a hopeful issue. Experimental work is already started for the former, while a further development of industrial therapy, recently begun, will undoubtedly see the latter on the way to realisation. This, combined with central psychiatric

institutes and out-patient clinics in all the general hospitals and health centres should materially help to solve this problem.

Enough has been discussed under this heading to indicate the complex ramifications of the present and future health problems of Siam, showing the gradual broadening of public health into public welfare. But a few words of justification will not be out of place. The health authorities are often criticised, usually by implication, amounting to the "constructive" advice that they should do "something about everything" with their present limited resources, whereas a little reflection will assuredly convince the critics that it is infinitely less wasteful and more expedient to confine our activities only to doing everything about some things. The criterion of relative value is the only possible one. Not to see the wood for the trees would be a serious mistake under existing Siamese conditions, and we literally cannot afford to temporise nor to make expensive mistakes in order to augment our experience. To borrow a Shavian phraseology, it is only "our capacity for experience" that should be critically called into question.

#### **The Problem of Medical Service.**

The Directing Vice-President of the Siamese Red Cross Society, in a contribution to Volume I, No. 9 of the "Red Cross", gave a most suggestive bird's-eye view of the medical personnel of Siam. The article began with a brief reference to a reported lecture given by Dr. W. W. Peter, member of a health educational association in China in 1923. According to the statement of Dr. Peter, Siam then stood in need of some 5,000 scientifically trained physicians whereas the number of the fully qualified was estimated at about 100. Dr. Peter believed there were about 500 persons trained up to the standard of the government curriculum at the time, and approximately 10,000 untrained actual practitioners. Basing his conclusion partly upon the contemporary statistics of *progressive* countries, the Vice-President gave as his general opinion that a ratio of *one medical attendant to 2,500 heads of the population would be ample for Siam*. In view of existing conditions, this seems at first sight a bold assertion. With the

estimated population of 1923 at 10,041,000 the ratio would work out at a trifle more than 4,000 general medical practitioners then required for the whole country, or at roughly 4,700 with the population of to-day which verges upon 12 millions.

Now, after a lapse of seven years, and with the advantage of additional data derived from the registers of the Medical Council it is possible to be more explicit in making quantitative statements. The medical registers for the Metropolitan Area—those for the rest of the Kingdom not being yet available—reveal a total of 1,850 persons actually carrying on *general* practice. The ratio of practitioners to the present estimated population of 950,000 thus works out at 1 to 517, a conservative ratio as will subsequently be seen. The application of this to the estimated present population of the rest of the Kingdom, say 11,000,000, would yield, all things being equal, a quotient of over 21,000, thus making an estimated total of over 23,000 general practitioners of curative medicine for the whole Kingdom, that is to say, a number well over *twice* that estimated by Dr. Peter and nearly *five times* that estimated at the rate suggested by the Vice-President of the Red Cross Society. This assumption of similarity of conditions between the metropolis and the interior is, of course, improbable. But the case, nevertheless, stands.

Why then did Dr. Peter declare in 1923 that Siam then required 5,000 qualified physicians? Or, much more interesting still, what were the assumptions of the Chief Executive of the Red Cross Society when he boldly put forth the ratio of 1 to 2,500 which is tantamount to advocating an absolute number of well under 5,000 as being the total number of qualified physicians and surgeons required for the whole country to-day? To answer these questions, it is necessary to look more closely into existing facts. In the meantime the last figures should be well borne in mind by the reader.

Since the foundation of the Medical School, a total of 563 certificates and 34 degrees (an annual average of 17 for the latter) have been conferred, making a total of 597. Allowing for natural casualty and superannuation in the course of forty-one

years, the total number of medical graduates in actual employment or practice will probably not be greatly in excess of 500. Of this number 280 (or 56%) are in the employment of the civil administrative services of the Central and Local Authorities, and 131 (say 26%) are employed by the Defensive Forces, making a total of 411, or about 82% of all the available medical graduates. It should be noted that this makes no allowance for the organized medical services of the Red Cross Society, which employ 32 or 6%, and possibly other organized agencies. If all known graduates were included to form a total of 443 physicians and surgeons employed by all the *organized* services of the Kingdom, the percentage of those in private practice to-day (not counting foreign graduates) will be reduced to something *less than 2 per cent*. It will thus be seen that the difference between the actual number of medical graduates and the total estimated requirement of Siam is approximately 4,500 or 90%, which represents the starting point of a rapidly growing number to be made up in a reasonably near future, as *every decade of delay will involve a cumulative loss to the health and especially the economic welfare of the Kingdom*. In this lies the national problem of medical service.

A short reference here to medical education both at home and abroad, the main sources of supply of the scientific medical personnel of Siam, may perhaps be useful in this short treatise on national medical service. The present capacity of the Medical Faculty will probably produce an average annual number of, say, 17 graduates or less. In view of this small number, there is a strong presumption that, after reckoning current expenses and over-head charges which should include interest on invested capital, depreciation, etc., the "cost of production" per successful student is far too high. The alternative of medical education in foreign countries, apart from its probable enhanced quality, is a matter to be constantly borne in mind. But, of course, there are *other considerations* apart from economy. The criterion of relative value undoubtedly received the full attention of the reformers of the Medical School when they decided upon this seemingly heavy sacrifice of the present medical service of the nation, not to

mention the other health services. There however remain four improvements of practical and immediate interest from the points of view of national health as well as national economy. These are as follows:—

1. An adequate "capital expenditure" on medical education, if necessary by means of a loan, in order to attain, as soon as possible, the *minimum of "economical expenditure"*.

2. The revival of *medical certificates* or diplomas (comparable, say, to the English M. R. C. S., L. R. C. P.) for the "by-products" of the best attainable medical education, in order more adequately to provide for *the only satisfactory method* of raising the standard of medical service in the Kingdom.

3. A *parallel, and adequate* public provision for the employment of *all* future medical graduates, with the prevailing salaries at least *doubled*, as it is a significant fact of the present relative *unattractiveness of medicine as a career* in this country that the current first year course of the Faculty only contains 12 students.

4. The re-organization of the medical educational scheme in order to include almost as much of an alternative course in preventive medicine as is contained in the 6½–7 years curriculum, for a good instance, of the Medical Faculty of Oslo University,\* as almost *one third of all graduates are employed by the public health services*.

The reasons for these hypotheses will be gathered, it is hoped, from the rest of this and the following headings. In the meantime it suffices to state that a much more strenuous advocate of the second of these reforms is to be found in Morden Carthew, M. D., D. P. H., one of the former Advisers of the Department of Public Health, and for many years on the staff of the Metropolitan Health Organization of this country.

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In the same monograph on which the present subject is based, the Vice-President of the Red Cross Society also guides his readers to an astute and realistic glimpse into the mysteries of the

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\*Ref. Report on Norway by Dr. Th. Madsen, League of Nations.

respectable practitioners of the ancient and dogmatic art of healing as well as, of the disreputable merchants of more shady practice. As such persons supply more than nine-tenths of the present medical need of the nation, it will be worth while to give a short description of their activities. The authority, referred to, suggested eleven categories for their classification which in itself is a revelation. These are:—

(1) The Apprenticed Healers who follow the dogmatic traditions of the past and very often are highly respected, experienced and useful men;

(2) The Healers with Prescriptions who possess one or more specific recipes of repute, handed down from generation to generation or from preceptors to pupils;

(3) The Boil and Wound Healers, the former generally using ointments and forming a class that is rapidly disappearing through the encroachment of modern methods of minor surgery, while the latter were originally the dressers of foreign surgeons before the advent of modern antiseptics, who confine their work to a crude form of surgical practice;

(4) Practitioners of Massage, a highly skilled class who do considerably more good than harm;

(5) The Unqualified Midwives who decidedly do much more harm than good;

(6) The Male Nurses who were previous members of hospital or other organized medical staffs and are useful as long as they confine themselves to their proper capacity;

(7) The Healers by Exorcism who employ water or magic spells and are somewhat analogous to the Christian Scientists, or at best to those who practice auto-suggestion;

(8) The Vendors of Drugs, including those who sell simples, as well as modern remedies and patent medicines—another national health problem, by the way, "economically resulting from the meeting of the older order with the new" (*idem*)—and, like their prototypes in all lands, have a weakness for untruthful advertising and for advising their customers;

(9) The Healers' Apprentices and Entourage who naturally



dabble in "craft" of the household;

(10) The Healers by mere Wit or Conjecture who are "quacks" properly speaking, and finally

(11) The rest of the Imposters who just manage to escape the criminal courts and the gaols.

The prevailing nationalities of these, apart from the Siamese majority, are Chinese, Burmese, Hindu and occasionally European. Their number is greatly in excess of the demand owing to the rising standard of living and the necessity for some form of livelihood. Any drastic suppression of all these unscientific practitioners will be out of the question until the medical personnel of the Kingdom has reached a few thousands. "In how long?" one wonders.

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In conclusion of this necessarily curtailed account of medical service in this country, it is well to recall the remarks of Sir George Newman in the letter previously quoted. The phrase he used was "*to dovetail medical service in the whole system of government...*". These pregnant words from one of the most expert health administrators as well as the recent remarkable resolution of the British Medical Association actually advocating state medical service, are significant signs of the time. They indicate what appears to be the logical and inevitable trend of medical service, not only in England but all over the world. May not one then enquire whether this is not indeed the beginning of the end of *laissez faire* in medical matters? The query is of course a relative one, for with the possible exception of Abyssinia, there seems to exist no country to-day in which public control in some form or other is not exercised over medical practice. This will however form the subject of our next heading.

Over four years ago Dr. Ira Ayer, the former Adviser of the Department of Public Health, drew the following conclusion from the premises of the existing *facts*:—"The large proportion of government physicians in the interior provinces is significant. As they are required to give medical service to the general population, there is already a real government medical service and *it seems*

more than possible that conditions in this country may lead to a state medical service from the beginning, while not a few western nations are gradually feeling their way toward building a similar system upon the long established traditions of private practice. This would appear to be the *best present solution* of the problem of medical service in the interior of Siam..." Thus the ever conciliatory Adviser. It however remains to be seen—not perhaps within our lifetime—whether a country that has once adopted *organized medical service* as a social doctrine will afterwards recant and go back to the so-called "liberty" of private practice. In the light of this conception of a nation-wide organization—of embryonic "Mayo Clinics"—the *ratio of 1 : 2,500*, above quoted, will be seen to be *quite ample*.

Addressing a Rotary gathering some years ago, the present writer said: "We (public health workers in Siam) have one great advantage over our colleagues in some of the most enlightened and progressive nations of to-day. For public health work is relatively new here and being small and agile, we are able, through their generosity, and by their very kind assistance to step on their broad shoulders. From this elevation we are able to look on their great achievements, *not as models* perhaps, but certainly as most valuable *guides* in our undertaking." The application of what was then said to the case in point is obvious, with the exception that for this context the words "*useful signposts*" should rather be substituted for "valuable guides." To the "practical" objectors, and their number will likely be nearly identical with the existing small minority of *bona fide* private practitioners of medicine, both scientific and empirical—the dissenting voice of the pseudo-scientific quacks and charlatans being disregarded—one might answer with the pertinent catechism of Anatole France, "Avant d'embrasser votre religion, avez-vous exigé qu'on vous montrât la carte de Paradis?"

#### **The Medical Council.**

This is a body which, in popular notion, is often confused with the Health Council. The only common features between them are that they are both under the jurisdiction of the Minister

of the Interior, that they deal with medical or quasi-medical matters and that a few official members serve on both. Perhaps the ex-officio presidency vested in the same individual also helps to make the confusion more confounded. But in constitution and function, a greater contrast can hardly be imagined. The Health Council is deliberative and advisory, while the Medical Council is executive, regulative and almost magisterial, as will subsequently be seen.

The preamble of the Medical Law, B. E. 2466, is translated—the italics being introduced for the purpose of emphasis—as follows:—

“ WHEREAS the practice of the art of healing including the use of medicine has an important influence on the well-being of the people ;

“ WHEREAS in this Realm of Siam such practice is at present without regulation and control leaving the general public without adequate protection against the dangers arising from the practices of ignorant and untrained persons ;

“ AND WHEREAS it is deemed expedient to *control, regulate and raise the standards* of the practice of the art of healing ;

“ THEREFORE be it enacted as follows :—”

“ The art of healing ” is defined in the Law and the Amendment as including the “ practices of medicine, surgery, obstetrics, dentistry, pharmacy, midwifery, nursing, massage or treatment of the sick or ailing by any method whatsoever ”.

The first drafting committee, in its covering report, postulated that the conditions of practice of the curative arts then prevailing in Siam, differed materially from those which existed in nearly all European countries and in America, in that the medical profession in the latter countries has been established upon a scientific basis and under control for many years ; whereas in Siam almost the reverse was the case. This remains nearly as true to-day as it was eight years ago. It may have been gathered from under the preceding heading that the actual proportion of the qualified to the unqualified, (roughly estimated at 1 to 40) and also comparatively to the total requirement of the Kingdom (already shown as equivalent to a shortage of over 90%)

is practically negligible. Any plan for registration must, in order to be practicable and *realistic*, include the class of unqualified and untrained practitioners, in which are to be found the overwhelming majority of persons upon whom by far the greater part of the population of the country—not only in the rural, but especially in the urban districts—necessarily depend for their medical care or else entirely do without it.

The objects of the Medical Law is not only to register practitioners in order to protect the public against malpractice by irresponsible and dangerous persons, but also to *limit within safe boundaries the practice of all unqualified but bona fide practitioners* in the Kingdom. By the direct means of education as well as by an indirect process of gradual elimination it is the national policy to raise the standard of medical practice. For the last purpose, the Ministerial Regulations, issued under the Law, provide for periodical renewals of licences of all practitioners except in the highest grade, defined as those who practise “in any branch of the art of healing who hold certificates of proficiency in that branch from the Ministry of Public Instruction or from any school which in the opinion of the Medical Council ensure an equal standard of proficiency.” Apart from this feature of the Siamese law, *believed to be unique*, the Medical Law provides for the usual powers of licence and registration as well as for legal proceedings and penalties.

The Law is supplemented by the Regulations which deal with the conduct of meetings of the Medical Council, the election of its Non-Official Members, details of registration, licensing and re-registration, revocation and reinstatement of licences, local record of licences, designation of grades, limitation of medical practice, fees and professional conduct.

As to the Medical Council itself, it is composed, apart from its President, of eight Official Members, representing the Ministries of the Interior and Public Instruction, the Department of Public Health, the Army and Navy Medical Services, the Faculty of Medicine of the Chulalongkorn University, the Red Cross Society and the Medical Association of Siam. Under Section 4. C.,

“Not less than two nor more than seven Un-Official Members elected at a general meeting of the Medical Council and selected to represent the registered practitioners of the art of healing in general practice in Siam complete the composition of the body which is a juristic person.” Other senior officials of the Council are the Vice-President elected by itself for a term of office, and the Secretary-Registrar, who must be a qualified physician holding a certificate from a recognised medical school. It is another unique fact that the present occupier of the latter post is a lady doctor who obtained the degree of M. B. of the University of London.

The powers and duties of the Council are as follows:— Under “Section 8. The Medical Council shall draft Ministerial Regulations for the purposes of this law...”. It is also provided by Section 9. that “A. The Medical Council shall be empowered to grant licence to any person to practise..., to register such licensed persons, to make such enquiry or investigation as may be necessary...(and) to determine the fitness of any person to be registered under this law... B. The Medical Council shall act as an advisory body to the Ministry of Education (now Public Instruction) regarding the standard of teaching, examination and proficiency to be attained...”.

The Medical Law is now in force in the Metropolitan Area. Its extension to some of the Circles of the interior is under consideration, and it is hoped that within a year or two the entire Kingdom will be brought under regulation.

The following tables give details of grading as well as other data concerning practitioners in the different branches in the Metropolitan Area:—

TABLE I.  
PRACTITIONERS IN THE MODERN ART OF HEALING.

Medicine, Surgery & Obstetrics		Dentistry		Pharmacy		Midwifery		Nursing	Massage	Total
Qualified	Un-Qualified	Qualified	Un-Qualified	Qualified	Un-Qualified	Qualified	Un-Qualified	Qualified	Qualified	
183	74	3	56	25	110	150	14	16	..	631

TABLE II.  
PRACTITIONERS IN THE EMPIRICAL ART OF HEALING.

Medicine	Pharmacy	Midwifery	Massage	Total
1,850	631	222	179	2,882

TABLE III.

Countries from which Degrees and Diplomas were obtained	Medicine Surgery & Obstetrics	Dentistry	Pharmacy	Midwifery	Nursing
Siam	141	—	18	142	10
U. S. A.	12	—	—	2	—
England	13	—	2	1	4
Germany	4	—	4	—	1
France	2	—	—	—	—
Denmark	1	—	—	—	—
Switzerland	1	—	—	—	—
Russia	1	—	—	—	—
Hongkong	2	—	—	—	—
Japan	1	—	—	—	1
China	2	1	—	—	—
India	3	1	1	—	—
Belgium	—	1	—	—	—
Indo-China	—	—	—	1	—
Philippines	—	—	—	4	—
Total	183	3	125	150	16

#### Future Probabilities.

"In its *first stage*," wrote Dr. Leslie Mackenzie, "public health is the application of scientific ideas to the extirpation of *environmental* disease. In its *second stage*, it is the application of scientific ideas to the production of *personal immunity*. Everywhere, it is the synthesis of prevention and cure." The italics are inserted by the present writer with the expectation that the reader who has taken the trouble to follow the underlying ideas contained in the foregoing pages will not fail to grasp the fact that the public health movement in Siam, virtually begun fifteen years ago, has hardly emerged from its "first stage."

An attempt has been made to show that the national Health Authority is concerned at this particular juncture with the conditions of environment that affect the health of the individual.

In this capacity, the Authority exercises powers in relation to such matters as water supply, drainage, cleansing and general sanitation. In the second place it begins and hopes to exercise more duties which have for their object the conservation of health or the prevention of disease in the individual. In this capacity it is beginning to concern itself with maternity and, under certain stipulated conditions, with infant welfare, tuberculosis, leprosy, venereal and other diseases. It believes its plan for vaccination to be complete; while increased provisions for organized medical services will most likely follow greater public endowment of medical education, properly orientated, it is to be hoped, in the direction of *service* rather than in that of professional venture.

Professor Bastable in his universally acknowledged classic, "Public Finance," declares: "It is not conducive to the interest of the nation to concentrate all administrative authority in a single centre. The gains from centralization may be great, but to obviate the evils that accompany it, a wise decentralization is also requisite. Having secured political unity, it becomes the task of the statesman to so distribute the functions of government as to obtain the best political and financial results. The earlier historical movement that has led to combination needs to be supplemented and corrected by the rational process of division of duties." The application of this universal truth to the present state of public health and medical service in Siam is more than obvious. It is in fact inevitable and urgent. If a material evidence were needed, the fact that the Department of Public Health daily deals with an average of over one hundred and fifty documents of correspondence fully proves that the limit of central responsibility in health matters is reached. The proverbial "last straw" of centralization can only be avoided by undelayed assignment of duties to local authorities. Remarkable as it may seem, but a logical outcome of the national policy, it is the same department that was entrusted with the first complete draft of a Municipal Law which, in its present form, is a veritable public health code. There are reasons to believe that, in spite of certain difficulties of adjustment, the following year should see its pro-

mulgation and enforcement in some of the existing Sanitary Areas not excepting that of the Capital.

It is readily to be admitted that further provision is needed for the continuous acquisition of knowledge and the prosecution of national and local researches, in order to furnish proper bases for future practical policies. But at the same time it is an undeniable truth that it is far more preferable to err along the path of *application* of limited knowledge than to stray in the empty wilderness of unapplied or even inapplicable abstractions. Here again it will be seen that rapid extension of medical as well as other scientific training is imperative. Public health progress starts at the rail-head of Elementary Education and its temporary terminus must be at the rail-end of Higher Education.

As an echo, pleasing to the sympathetic ear of any one who is sincerely devoted to the cause of civilization and humanity, it may be finally reiterated with the doubled maxim that *both health and education are purchasable commodities.*



