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"MEDICINE AND MEDICOS, ANCIENT AND MODERN"*

by

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I propose to-day to tell you something of the development of western medical science and of western medical art; and to attempt to emphasize the difference between them.

It lately fell to my lot to read a number of essays submitted by students of this University, comparing the medicine of the modern West with that of ancient China. Reading these essays and pondering on the historical aspect of medicine in general, I was struck by the essential similarity in the personal qualities necessary for the true success of the physician, whether practising to-day or ages long ago. For though modern scientific medicine, a branch of applied biology built upon the foundations of inductive logic, rapidly extending its boundaries by means of the experimental method, has very little in common with older medicine, whether expounded in the Cannon of Avicenna or in the Difficult classic, the physician, the practitioner, in his daily contact with credulous humanity, is still the same old Adam, with most of his faults and let us hope, most of his virtues; and in his relations with his patients, as well as with his colleagues, he cannot do better than model his code upon that of some of the great physicians of antiquity.

Over 2,400 years ago, a Greek practitioner established a clinic and medical school in a small island outpost of the Greek Empire named Cos. The doctor's name was Hippocrates. Judged by modern standards his equipment was lamentably feeble. His knowledge of anatomy was largely speculative, his physiology and pathology quite erroneous. Bacteriology was to him a closed book. This man however, with so deplorable a foundation of the institutes of medicine,

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was in no sense a quack. He made the most of his opportunities. He carefully observed and studied the patients who appeared before him, their signs and symptoms. He approached each clinical problem with an open mind and allowed no preconceived conventional doctrine to influence his judgement in treatment. His therapeutic armamentarium was small, but was based upon such simple treatments as he personally found to be effective. He made no false mystery of his art and freely taught of all he knew to his pupils and his colleagues. To his patients he was honest and humane.

The methods of Hippocratic medicine, based essentially upon clinical experience were employed among the Grecks for centuries after the death of Hippocrates. They have been set forth in a number of books by various Greek authors. This group of books is known as the Hippocratic Collection. Although quite radical surgical procedures such as trephining the skull were described in the writings, in cases in which surgical intervention was not indicated, the Hippocratic physician adopted for the most part what is called the 'expectant' line of treatment. Realising that in general the tendency is for the body to recover, he contented himself with aiding the healing powers of Nature, employing for the most part such measures as nursing, diet and regimen. The use of drugs was largely limited to the judicious employment of a few well-chosen ones.

Hippocrates stands for all time as the ideal physician. His name is revered not as a medical scientist, but as a practitioner who must perforce apply to the needs of sick mankind all the resources at his command. The figure of the Hippocratic physician has been of incalcuable spiritual value to the medical profession in the twenty-three centuries that have passed since his death. The Hippocratic Oath, though probably modified at a later date than Hippocrates, still emphasizes all that is desirable in the ethical conduct of medical art. Its text is as follows. "I swear by Apollo the healer, invoking all the gods and goddesses to be my witnessess, that I will fulfill this Oath and this written convenant to the best of my ability and judgement. I will look upon him who shall have taught me this art even as one of my own parents, I will impart this art by precept, by lecture and by every mode of teaching. The regimen I shall adopt shall be for the benefit of the patients according to my ability and judgement, and not for their hurt or for any wrong. I will give no deadly drug to any, though it be asked of me, nor will I counsel such, and especially I will not aid a woman to procure abortion. Whatsoever house I enter there will I go for the benefit of the sick, refraining from all wrong doing or corruption, and especially from any act of seduction, of male or female, of bond or free. Whatsoever things I see or hear concerning the life of men, in my attendance on the sick or even apart therefrom which ought not to be noised abroad, I will keep silence

thereon, counting such things to be sacred secrets. If I fulfill this Oath and confound it not, be it mine to enjoy Life and Art alike, with good repute among all men at all times. If I transgress and violate my oath may the reverse be my lot."

During the thousands of years that followed the breaking up of the Roman Empire, the medical practice of Europe was at best a corrupted imitation and misunderstanding of the Hippocratic teaching; at worst it descended to a low level of animism and magic. Then, following the Renaissance with the recovery and study of the ancient writings in the original Greek, came a re-appreciation of the Hippocratic works. The very words of the Hippocratic Collection came to be taught in the medical schools in a spirit however, that was anything but that of Hippocrates. For the usual method of instruction was for the professor to sit aloof in his chair and read to assembled students passages from the works. Experimental verification of the statements therein was severely discouraged as offending against all the cannons of good taste. These were the days when many of the most learned physicians considered it beneath their dignity to see patients. They would pronounce a diagnosis and order a treatment from the appearance of a patient's urine, brought to them by an apothecary or lower order of doctor. A practice, you will note not unknown in our times, only now-a-days the urine examiner may call himself a clinical pathologist. Gradually however, a better understanding crept into men's minds. The spirit of the Hippocratic writings rightly came to be exalted above the works themselves, which became dropped from the school curricula. Nevertheless, the methods by which you are now taught the elements of medicine: case-taking, bedside instruction and clinical lectures, are derived from this ancient Greek source.

By the middle of the seventeenth century, European medical practice had little of the simplicity and was attended by little of the intellectual honesty of Hippocrates. For although by this time considerable advance had been made in the sciences of anatomy and physiology, due mainly to the labours of Leonardo da Vinci, Vesalius, Eustachius, Fabricus and Harvey, clinical medicine, however, remained in a backward state, for there was little honest clinical observation. Degrees in medicine were awarded by the universities without any requirements for clinical instruction, or examination in clinical knowledge. Clinical practice was dominated by cut and dried doctrines. Treatment was the reverse of Hippocratic. The healing power of Nature rather than aid was embarrassed. The unfortunate patient being bled, purged and drugged with an alarming assortment of horrors in origin animal, vegetable and mineral, many of the prescriptions savouring rather of the witch's cauldron than of the apothecary's mortar:—

"Fillet of a fenny snake,
Eye of newt and toe of frog,
Wool of bat and tongue of dog,
Adder's fork and blindworm's sting,
Lizard's leg and howlet's wing,
Scale of dragon, tooth of wolf."

A recipe reminiscent, perhaps, to some of you of many a prescription persuasively set forth in the pseudo-scientific literature with which some firms of medicine vendors now-a-days regale us. The quack now calls himself an endocrinologist, and his quackery polyglandular hormone therapy.

However, during the last two hundred and fifty years there has been a vast improvement in the general conduct of medical practice.

No one was more instrumental in re-introducing Hippocratic ideals into seventeenth century medicine than a London physician named Thomas Sydenham. Sydenham devoted himself to the study of the natural history of disease. He has been justly named the founder of modern clinical medicine. His definition of a physician was an follows.—"The function of a physician is the industrious investigation of the history of diseases and of the effects of remedies as shown by the only true teacher—experience, attention being directed to that method only by which right reason based upon common sense dictates." Sydenham was one of the first to recognise various infective fevers as specific entities. He left a good description of malaria or 'ague' as it was then called and which was prevalent in the marshy districts of Eastern England. In treatment he emulated the honest simplicity of Hippocrates, contenting himself for the most part in aiding the healing powers of Nature. For at that time very few specific remedies were known. Cinchona, the plant from which quinine is now derived, was beginning to be valued in the treatment of various fevers, and it was largely due to Sydenham that its use in the treatment of malaria became popularised. This drug was originally introduced by Jesuit priests from the new Spanish colonies in South America, where it had a reputation among the aboriginals. It provides a good example of an empirical discovery, for we know now that the alkaloid quinine has a specific lethal action on the parasite of malaria. That malarial fever was due to the invasion of the blood by a parasite, was not to be discovered until two hundred years after Sydenham. For not until 1880 did the Frenchman, Laveran first espy the hostile plasmodium. And not till eighteen years still later did Ross discover the rôle of the anophiline mosquito in the spread of infection.

Of the medical galaxy following Sydenham, time does not permit me to mention more than a few names. Boerhaave teaching medicine

at Leyden in Holand, early in the eighteenth century, was one of the first to give systematic clinical instruction correlated with pathological demonstrations in the post-mortem room; so emphasizing the relation of lesion to symptom. A man of wide culture he, more than any man of his time, helped to bring to the aid of medical art all that could usefully be derived from the sciences of chemistry, botany, anatomy and physiology. He attracted pupils from all over Europe, and through some of them was the real founder of the Edinburgh medical school, the first in Britain to correlate scientific with clinical teaching in one university. The development of morbid anatomy as a science, that is the study of the structural changes which occur in the diseased body, was in the first place largely due to the Italian, Morgagni at Padua, in the middle of the eighteenth century. The main foundations of the subject were completed by Rokitansky in Vienna nearly a hundred years later. It should be noted that the fame of both these men rests upon their reputations as scientists, not as clinicians. In fact Rokitansky did not practise medicine at all. The sciences of experimental pathology and physiology, one might say of experimental biology, were enormously advanced by the work of John Hunter, a London surgeon, towards the end of the eighteenth century. Though a practising surgeon, he had an insatiable appetite for general biological knowledge, and was a confirmed experimenter. By the end of the eighteenth century then, the foundations of medical art were well and truly laid; and in its service the various sciences were being systematically harnessed.

The early part of the nineteenth century was mainly concerned with consolidating the positions already won; nevertheless considerable advances were made by the French school, particularly by Bichat in pathology and Laennec in clinical medicine.

The later part of the century witnessed great developments in the various branches of pure science, which were to have a revolutionary effect upon medicine. The most striking feature perhaps, of this phase of the advance, was the pursuit of systematic research in experimental biological sciences ancillary to medicine. There was greatly enhanced activity in this respect in the universities, particularly in Germany, where the prosecution of research became encouraged by the liberal provision of scientific chairs with well equipped laboratories. Appreciation of the ultimate value of researches in pure science became much more general. Investigation of natural phenomena to satisfy scientific curiosity no longer needed elaborate apologia. The investigator became less frequently regarded as an impious lunatic. The more intelligent among the general public began to realise that there were many valuable gifts to be won from Nature's store house, but that they were to be won not by the chance findings of a magic password, nor by personal favour of the Deity. For it was becoming

apparent to men, that although Nature will give to those who study her and know how to ask her, she will give to those who importune her for something for nothing, as little worth—while as she has ever given the magician or the seeker of the philosopher's stone. It is related of Benjamin Franklin, the American physicist and pioneer researcher in electricity, who when first demonstrating a new-born theory was asked by the people around him "But what is the use of it?" He answered them "What is the use of a new-born child?"

Probably the most luminious example of a nineteenth century scientist conferring great gifts upon medicine was the Frenchman, Louis Pasteur. He was born in 1822 of humble parentage and died in 1895 honoured by France and by all the civilized world. He started life as a teacher of chemistry and physics in a provincial school. His first scientific interests were in connection with certain problems of crystal formation. Then he became interested in the difficulties experienced by the local brewery, his introduction to pathology being then, by the way of diseases not of men but of beer. During the next few years he devoted himself to the investigation of the nature of fermentation. He eventually proved to the doubting world that this action is dependant upon the presence of certain microscopic living organisms. He further proved that the action of each kind of organism was specific for the type of fermentation produced. By ingenious experiments he disproved the then commonly held theory of spontaneous generation of microbe life; for he demonstrated that however favourable the pabulum, it remained free from microbes if the access of the germs were prevented. Pasteur's interest was next absorbed by a disease of silk-worms which was causing great distress in the silk-worm industry, an important one in France. He proved that the disease was due to a specific micro-organism. So, in 1866, for the first time in the world's history, became established the microbic conception of infectious diseases. It is of interest to note that microbes were first seen and described some two hundred years previously by van Leeuwenhoek, a Dutch spectacle maker, who perfected the art of grinding very small simple lens of high magnification. Pasteur now began to turn his attention to the diseases of the higher animals including man. The first disease he studied was one affecting chickens, called fowl typhoid or chicken cholera. He found that he could grow the microbes in the laboratory in flasks of broth. A drop of such a broth culture inoculated into a healthy fowl would cause the bird to develop the disease. He then stumbled on the striking discovery that if fowls were injected with old cultures in which the microbes had become dead or feeble, not only did no disease ensue, but the fowls were now resistant to the subsequent injection of fresh active cultures of the microbes. Thus did Pasteur lay the foundation stone of the important science of

immunity. Working out a technique along similar lines he was able to immunize thousands of sheep against the deadly disease known as anthrax. Since then it has become possible to immunize man against many diseases, of which the most familiar example is typhoid fever.

Pasteur by this time had become emancipated from his teaching duties, money had been raised to enable him to devote his whole time to bacteriological research. The imagination of the French public had been stirred by the possibilities of curing and preventing disease in man by means of this new science. Pasteur was elected a member of the French Academy of Medicine although he was not a medical man. His further scientific career was marked by a series of triumphant discoveries of which the most spectacular was the discovery of method of treating successfully human cases of the dreaded rabies or hydrophobia. Amongst the first of his cases was a group of Russian peasants, who, all badly bitten by a mad wolf, travelled in desperation to Paris beseeching Pasteur's aid. He saved sixteen of the nineteen. The world was thrilled, and the Tsar of all the Russians sent 100,000 francs to start the building of the laboratory now known as the Pasteur Institute.

Reference to this pioneer work in bacteriology would be one-sided were no mention made of Pasteur's brilliant German contemporary, Robert Koch, who however, appeared on the scientific firmament a few years later than Pasteur. Koch had a medical training and was a district medical officer when he began his researches on the bacteriology of anthrax. His early triumphs, though perhaps lacking the inspirational genius of Pasteur, were based upon the thoroughness and brilliance of his technique. He it was, who by a most painstaking and brilliant series of experiments, showed that tuberculosis, aptly named the white scourge of humanity, was an infective disease due to a specific microbe. Like Pasteur, Koch also was enabled by the proper appreciation of his government to devote himself to experimental research in a well-equipped institute built for him in Berlin. To Koch, more than to any man is due the working out of the difficult technique of experimental bacteriology.

One of the first and most dramatic benefits to practical medicine of this new science of bacteriology, was the application of its principles by the British surgeon Lister, to the problem of wound infection. Now by the middle of the nineteenth century anaesthesia was coming into common use in the European surgical clinics, and operative technique had become sufficiently advanced to permit quite extensive operations, but operative surgery was still greatly dreaded on account of the frequency with which wounds would become septic during convalescence. At that time wound sepsis was known as hospital

gangrene. It would spread like wild-fire through the surgical wards of a hospital, until nearly every wound was discharging evil-smelling pus, the tissues in the neighbourhood of the wound undergoing rapidly spreading decomposition often ending in the death of the patient. The cause of this gangrene was unknown and the condition was regarded as an inevitable risk of surgery. Lister, who at the time was professor of surgery at Edinburgh, having heard of Pasteur's work on fermentation, suspected that gangrene might also be due to bacterial action. He tried out the technique of anti-septic surgery, in which the operation is performed under conditions calculated to kill all living germs. His instruments and dressings were washed in carbolic oil, the atmosphere of the operating room was sprayed with it and the surgeon wore a clean coat and washed his hands in carbolic. The results were most gratifying, for by means of this procedure, wound-sepsis became eliminated. As you know this technique has since been replaced by the more refined aseptic technique, which aims at preventing the access of germs by the preliminary sterilisation of everything coming into contact with the wound. Surgical gangrene is hardly ever seen now-a-days in civil practice. The story of Pasteur and Lister provides a perfect example of the prompt application on the part of the practitioner of the fundamental discoveries of the laboratory investigator.

During the closing years of the nineteenth century, bacteriology was enriched by a succession of discoveries, mainly by the pupils of either Pasteur or Koch. The microbic causes of most of the important diseases of man and animals were isolated and described. To mention a few:—diphtheria, typhoid fever, cholera, dysentery, cerebro-spinal meningitis, pneumonia, tetanus, undulant fever, plague. The last mentioned has special interest for you, for the plague bacillus was discovered here in Hong Kong in 1894 by the Japanese, Kitasato, pupil of Koch, and independently by the Frenchman, Yersin, pupil of Pasteur. To the scientifically minded, bacteriological investigations of this nature are of such interest as to render any additional inducement superfluuous, but the severely practical may enquire the direct utility of such researches. Knowledge concerning the bacteriology of disease has helped the physician in two main ways. In the first place it takes sanitation or preventive medicine out of the realms of guess-work and puts it on a rational footing. Exact knowledge of the cause of typhoid fever for example, has been of essential value to public health administration aimed at its prevention. In the case of plague, the further knowledge gained by the English investigators in Bombay, concerning the parts played by the rat and the rat flea in the transmission of the bacillus, was necessary for the proper control of the disease. In the second place, bacteriology has aided the physician by placing at his disposal knowledge of the reactions of the

body in infection. It is as a result of researches in this field of immunity, that preventive inoculation of individuals against such diseases as typhoid fever and cholera and the antitoxin treatment of diphtheria and tetanus have been rendered possible.

The first three decades of the present century have not yielded so many spectacular discoveries as the earlier years of bacteriology. Actually however, a vast amount of knowledge has been acquired concerning the more intimate habits of bacterial life and of its effects upon the infected host. The development of bacteriological technique in the nineteenth century placed in the hands of investigators a weapon they were not too slow to use in attacking the more obvious problems of infective disease. Their numerous successes testify to the efficacy of the new weapon. The work of the later bacteriologists has largely been concerned with attacking the more fundamental if less spectacular questions of infection, the solution of which promises to be of no little practical value.

Another field of investigation full of promise is that of bio-chemistry, the study of the chemical nature of the various substances composing the body of man and also of the microbe foe. An off-shot of this line of work known as chemotherapy has already conferred valuable gifts upon medicine. The pioneer worker in this field was Ehrlich, the German immunologist. His name will ever be remembered in association with the complex compound of arsenic which he evolved for the specific treatment of syphilis. He prepared 605 different arsenical compounds before he was successful, so he named the final product "606." In this line of work the Germans, with their chemical traditions, have been supreme. Two recent triumphs have the preparation known as "205," most effective in the treatment of trypanosomiasis, the scourge of man and beast in tropical Africa; and "atebrin," which promises to eclipse quinine in the treatment of malaria. Considerations of time forbid my making further reference to recent advances in medical science, and it is not my desire to do so. I have attempted rather to sketch for you a rough outline of the structure upon which modern medical practice has been built.

The practice of medicine is in the hands of the physician, who is concerned with curing patients when they are ill, and of whom it is becoming an increasingly important function to advise them how to avoid becoming ill. In enlightened states a growing number of doctors are paid by the community solely to protect it from illness: the public health service. Whether he be a practising physician, or a public health officer, the doctor is becoming more and more dependant for further advances upon the specialist laboratory worker: the pathologist, bacteriologist, physiologist and bio-chemist, and these in turn upon the pure scientists, the chemists, physicists and biologists.

The growth and complexity of various branches of medical knowledge render its investigation unprofitable except by one with training, leisure and facilities to concentrate upon one narrow front. Undoubtedly a danger lies in this narrow specialism. There tends to be a lack of correlation between workers on various fronts, and worse, a danger of narrow mental horizons. However, it is difficult to see the remedy apart from encouragement of team-work and of intellectual intercourse between various kinds of worker.

I do not wish to indicate that all further discoveries will be made by the laboratory worker and none by the clinician. There are undoubtedly many as yet unborn clinical discoveries of vast importance; but like the others, the field of clinical research can be explored most profitably by one with suitable mental and material equipment. To this end, whole-time posts are being created in many countries for research physicians who are prepared to devote themselves to investigation; who in other words, are content to regard the hospital ward as their final field of activity and not as a stepping-stone to consulting practice.

In clinical research, the importance of dealing with cases sufficiently numerous to permit of statistical investigation is becoming increasingly appreciated; particularly in assessing the value of various remedies. Many cases of most diseases do tend to recover spontaneously as a result of the healing power of Nature. So when basing his opinion of a treatment upon its effect on a small number of cases, the physician has been prone to fall into the error of "post hoc, ergo propter hoc," that is, wrongly attributing cause to effect. To this error is due the former wide-spread popularity of various measures we now consider useless, if not actually harmful; and also flourishing on this fallacy are the numerous quacks and charlatans. If you treat a number of cases of tuberculosis with coloured water, some of them will recover. It is only when you consider a large group of cases, some being treated with coloured water and some without, that you can obtain data capable of proper statistical analysis. The common saying that "statistics may be made to prove anything," is only true in the sense that evidence may be made to prove anything. The issue depends upon the reliability of the evidence and of the ability of the investigator to interpret it.

Faith is another factor which must never be forgotten in assessing the results of treatment. For there seems reason to conclude that in many diseases the outcome may be favourably influenced by a strong faith on the part of the patient in his doctor or in his medicine. And that brings us back again to the personal qualities desirable in the physician if he is to be a successful healer.

Our present day conception of the ideal physician then, is one who thoroughly grounded in the sciences fundamental to medicine,

and fully cognizant of all recent scientific advances in medicine, utilizes for the well-being of his patients, every resource at his command. Dealing with some diseases, he will find that success depends mainly upon his scientific competence .Such a disease is malaria, of which most early cases at any rate, can be treated satisfactorily by one competent with the microscope and having an adequate knowledge of parasitology and pharmacology. In other conditions such as neurasthenia, his success will largely depend upon his ability to treat not disease, but an individual patient, unaided by the resources of the laboratory; in short, his clinical art. It is cases of this kind which often try a doctor most severly, for the clinical skill demanded in a physician is often inversely proportional to the technical resources at his disposal. Drawing an analogy, I would compare the master of an old-time sailing ship with the captain of a modern liner. The former had daily demands made upon his skill as a seaman and a navigator, but took a long time to get his ship to port. The latter achieves this end much more rapidly and certainly, but aided by mechanical propulsion, directional wireless and perfected instruments of navigation, probably does not experience the same calls upon his personal skill and resourcefulness.

Our aim being the elimination of disease, the replacement of the skilled clinician of to-day by the test-tube votary of to-morrow will be unregretted if it brings us nearer our goal. For it may well be that advances in medical science will eventually render the expert clinical physician superfluous. Let us hope then, that the day may speedily come when most disease will be prevented and what does occur will prove amenable to prompt diagnosis and effective treatment at the hands of the technical expert, such as the surgeon, the radiologist, the bacteriologist and the bio-chemist.

I fear however, that such utopian efficiency will not be attained within the span of any of us here. The sphere of greatest usefulness for the majority of you, will therefore lie in the practice of that most difficult of arts, clinical medicine. You must take all that science can give you, using it with all the clinical skill you can acquire, strive your utmost to benefit the suffering fellow creatures you will have the honour to serve. So doing you will prove yourselves worthy of the mantle of Hippocrates.

REPORT OF DELEGATION TO THE NINTH CONGRESS of THE FAR EASTERN ASSOCIATION OF TROPICAL MEDICINE

NANKING, 2nd-8th OCTOBER, 1934.

by

Lien Tsoong Kya, Assistant to Professor of Surgery, The University, Hong Kong.

Apart from the proper Congress proceedings, I shall include in this report, all my impressions and observations of the hospitals in Shanghai and Nanking made during this visit.

I left for Shanghai on the 21st. of September as I originally intended to spend a few days in visiting several hospitals in Shanghai. Dr. S. F. Li, who travelled on the same ship with me, was a representative of the South China division to this Congress. On arrival, we were met by the representatives of the Quarantine Service who kindly looked after us and our luggage and welcomed us very cordially. They have rendered invaluable service and most helpful guidance to the delegates of this Congress, they worked very co-operatively and energetically. To them we should tender our gratitude and thanks.

I had six days in Shanghai, and I visited the following hospitals, namely: The Lester Chinese Hospital, Henry Lester Institute of Medical Research, The Red Cross Hospital, The Municipal Isolation Hospital for Chinese and Europeans, and the Police Hospital of the Municipal Council.

The Henry Lester Institute of Medical Research and Preventive Medicine and the Lester Chinese Hospital.

After the death of Henry Lester in May 1926, the board of Trustees of the above institute started almost immediately a scheme for the establishment of a Lester School with the intention to accommodate in future three hundred scholars or more and to erect buildings for the establishment of an institute for the study of medical science, surgery, civil engineering, architecture, and other scientific knowledge. In view of carrying out this scheme, the Trustees sought advice from the University of Hong Kong. In September, 1927, Dr. H. G. Earle visited Shanghai as this University's representative. It was then decided that two separate institutes should be built, one medical and the other technical. It was further recommended that the Medical Institute should take the form of a post-graduate organisation, with emphasis on research because there already existed in Hong Kong and Shanghai undergraduate medical schools for Medical education both in operation and for future development. This post-graduate medical Institute was not allowed to give diplomas or degrees to the post-graduate scholars, a resolution which was passed by the Chinese National Medical Association. It was not

till early in 1929 that the plan of erecting the present building for medical research was approved and work started on an independent site in Avenue Road occupying an area of 350 by 500 feet. This site accommodates the main building, the Resident Engineer and Technicians' quarters, the animal house and Director's residence. In 1931 a Clinical research unit in the New Lester Chinese Hospital in Shuntung Road was established, which occupies the fifth floor of the hospital.

The new building was designed for the research purpose by Messrs. Lester, Johnson and Morris. It was completed for occupation in the later months of 1932. In the year 1933, progressive improvements have been made and the building was made full use of along the lines of research. The institute is well equipped and fully staffed.

As a scientific unit of research it consists of not less than 70 members on the staff, including head of divisions, assistants, associates, fellows, scholars, and technicians. The sphere of work is divided into 3 main divisions, namely, division of Clinical research and experimental surgery, division of Physiological sciences, and division of Pathological sciences. A division of preventive medicine and medical statistics has also been recently instituted. Much work has been done in medical statistics of diseases in China. With reference to the division of Clinical research and experimental surgery, the work is carried on both in the institution and the Lester Chinese hospital. Research on Clinical medicine is also included in this division.

The Lester trust has met the cost of construction and equipment for the extra floor in the Shantung Road hospital and contributes annually to the hospital authorities the proportion of the running costs which the fifth floor represents. The department of Clinical Research has the benefit of the nurse and general service, the use of operating theatres etc., and the most essential requirements, that is the supply of Clinical material. On the research floor there are a total number of 48 beds for in-patients. Only cases under research investigations are referred to and admitted into the wards on the fifth floor. In addition to the wards there are, on the research floor, special laboratories for clinical biochemistry, biophysics, haematology, parasitology and electrocardiography. There are three theatres for surgical work and one smaller room for surgical diagnosis. It is also equipped with x-ray room and a small compact library for the staff.

The diseases which have been under special investigations are: Schistosomiasis Japonicum, relapsing fever, beri-beri, deficiency diseases, tuberculosis of bones and joints, infections of the genito-urinary tract, lymphatics and vascular disorders.

The Lester Research Institute in my opinion, is certainly a very well constructed and equipped centre for the purpose of medical research.

Undoubtedly with a vast number of experts in different divisions, much work can be done in the development of medical research.

I had the opportunity of visiting the Institution on two occasions, one of which was the reception which was given on the 28th. of September, 1934 to the delegates attending this Congress.

On that afternoon, the institute was opened to general inspection and a large number of scientific exhibits were put up in all the scientific divisions. Dr. H. G. Thompson and members of the staff kindly received the delegates and brought us round the institution. I was greatly impressed by the micro-photograph work, the large Cambridge microtome sections and work done in the pharmacological department on the study of Chinese drugs in relation with the prepared modern medicine.

The Lester Research Institute, we must remember has a very close relationship with this University from the time of its organisation. Today there are three men from this University doing post-graduate research there. I hope that this intimate relationship will not be severed in future.

The Red Cross Hospital.

The Red Cross Hospital is situated in Avenue Haig, under the directorship of Dr. F. C. Yen. Beside general medical services, it is now employed by the National Central Medical School in Shanghai as a teaching hospital. The senior students or internes take clinical duties in this hospital. Although it is not very up-to-date in equipment, they have all the facilities for carrying on scientific medical work. It has a strong staff and good discipline. I was told that they intend in the near future to move into the new hospital which is now under construction and preparation on the Rockefeller site in the French Concession. I had a general inspection of the wards and attended one operation, namely, thoracoplasty for chronic empyema.

Through the kind introduction of the Vice-Chancellor I was enabled to meet Dr. Allen, Director of Public Health of the Shanghai Municiple Council. He kindly conducted me round the Isolation hospital for infectious diseases for Chinese and Europeans. This hospital occupies an old building, but a new hospital for the Europeans will be built soon and the old section of the present hospital will be discarded. The other hospitals under the management of the Council is the Police Hospital and the Jail Hospital. The former is a new one which was completed a little over 2 years ago. It is a very up-to-date hospital in all respects.

All the Municipal hospitals are keeping Chinese doctors as the Medical Officers in charge and the Junior members on the service are chiefly local graduates, from St. John's Medical School. The medical staff is stronger than the surgical. In near future, additional members

will be included on the surgical staff so as to take charge of most of the emergency surgery and orthopaedic work. It was pleasing to hear how highly Hong-Kong medical graduates are esteemed in the Council Medical Service.

I left Shanghai for Nanking on the day previous to the Congress. Under the special arrangement of the Ministry of Railways of the National Government, delegates to this Congress were offered a reduction of half fares travelling on the train during the period of one month when the Congress was held. Special trains and travelling services were arranged to help the foreign delegates, who were received at Nanking by an organised reception committee whose duty it was to help the foreign delegates in every way possible, to make them comfortable and to familiarise them with the Chinese Capital so as to make their stay in Nanking most pleasant and enjoyable. This committee chiefly consisted of medical men from Peiping, Shanghai and Nanking, most of them were from Wai Shun Shu. Their efficiency and co-operative services should be highly praised.

The regular programme of the 9th. Congress started on the 2nd. of October, 1934. The detailed items on the programme can be obtained from the guide book. About half of the time was devoted to scientific sessions, while the rest was spent in visiting Public Health Centres, Hospitals, sight seeing and dinner receptions.

I understand that the programme was purposely so arranged so as to give foreign delegates every opportunity to see and know the recent work which had been done in the development of medical service and social services in Nanking, the capital of the National Government.

At the opening Plenary Session which was held on the 3rd. of October, 1934 in the Auditorium of the Officers' Moral Endeavor Association Building, speeches of welcome were made by H. E. President Wang Ching Wei, and H. E. Huang Shao Hung, Minister of Interior, and a presidential address was delivered by Dr. J. Heng Liu, the minister of Health of the National Government. (Appendix I). This meeting was attended by every member and the delegates to the Congress. The hall was full with a total attendance of over 500 people. At the first general meeting of the Congress, it was announced that Dr. O. Deggeler, Hon. general secretary of the association, owing to indisposition was unable to attend this Congress. Dr. E. W. Walch was elected by unanimous vote, the Hon. general secretary of the association. Nomination of members of the council for the 9th. Congress was also in the agenda.

The Council of the 9th. Congress was composed of a president, a vice-president, Hon. general secretary treasurer and three members from every country of the Far East.

The official delegates from Hong Kong were Dr. A. R. Wellington, Dr. R. B. Jackson and Dr. T. K. Lien. Before the conclusion of this meeting a group photograph of the members and delegates to the 9th Congress of F. E. A. T. M. was taken in front of the Officer's Moral Endeavor Association building.

The first Council meeting was held on October 3rd., 1934 at 10 a.m. in room 215, at the Central Field Health Station building.

At this meeting the financial report of the association was read and passed. It was announced that the association had that time in hand a balance of over 5000 guilders. A financial committee of 3 persons was appointed to audit the account.

Other items on the agenda were carried out in order except item No. 4 which was omitted as no invitation from any country had at that time been received.

The second council meeting was held on October 8th., 1934, the last day of the Congress. In addition to the items and their resolutions on the agenda, it was decided to recommend by the Council members of the 9th. Congress of F. E. A. T. M. that food problems, sanitary engineering, e.g., water supply or sewage disposal should be included in the round table discussions at the next Congress. The venue of the next Congress will be in Indo-China in 1937. (Appendix II).

Now we turn our attention to the scientific sessions of the Congress. Four days were devoted to the scientific sessions, commencing from Thursday, October 4th at 9 a.m. Scientific papers of different sections were read simultaneously in separate lecture halls. In each section there was a chairman who conducted the meeting and two rapporteurs who kept the time for the speaker and also collected papers and discussion slips after the paper was read. Every room, where meetings were held, was furnished with a lantern slide projector and 2 or 3 microscopes. The advantage of this arrangement was to save time but on the other hand one often missed one of the interesting papers if they happened to be read at the same hour in different rooms. Further more, any listener who wanted to go round every room for different papers had many a time found himself stepping into the hall in the midst of a lecture thus disturbing the attention of the whole hall by his untimely admittance into the room. Every paper was allowed 15 minutes for presentation and 5 minutes for discussion from each speaker, who, after he had spoken, was requested to fill in a discussion slip which was then handed in to the Rapporteurs. In spite of this, very little discussion was made during all the sessions. Owing to the large number of papers sent in to the Science and Publication Committee, it was decided by the Committee that only the selected papers whose authors were present at the Congress, were allowed to be read at the scientific sessions. Others were read by title though they were to be

included in the publication of the transactions at the end of this year. At the second council meeting, the council gave the science and publication Committee full power in selecting the papers for the publication in the transactions.

A total of one hundred and ninety-three papers were received and read. These were divided into ten sections, namely:—

	No. of Papers.
Bacteriology	21
Leprosy	12
Malaria	28
Medicine	34
Parasitology, Helminthology, Medical Entomology	37
Pathology	10
Physiology, Pharmacology, Biochemistry	23
Plague and Cholera	7
Public Health and Quarantine	9
Surgery, Obstetrics, Radiology, Ophthalmology, Dentistry	22

They were delivered in a total of 51 hours and 21 sessions. In addition, two round table discussions were arranged for plague and cholera. (Resolutions of these round table discussions appear in Appendix II). Subjects and abstracts of these papers are referable to the guide book and "Authors' Abstracts."

Three papers were contributed from this University, namely:—

"Intrahepatic Stones,"

"Nasopharyngeal Carcinoma," and

"Primary Carcinoma of the Liver."

Inspection of Central Hospital, Nanking.

The central hospital, Nanking was established five years ago, but the new building was completed only a little over a year ago. The ground floor consists of the Out-patient Department, emergency room admission office, dispensary, general administration office and No. 1 ward. On the first are the operation theatres and two wards. The 2nd and 3rd floors are occupied by general and private wards, X-ray room and massage room. The dormitories for the resident staff, and internes and nurses are separated from and behind the main building. It accommodates 336 beds which are distributed among the following clinical divisions:—

	No. of beds.
Division of Medicine	100
,, ,, Surgery	90
,, ,, Obstetrics and Gynæcology	58
,, ,, Ophthalmology	13
,, ,, Ear, Nose and Throat	10
First and Second classes	65

Among the 100 beds in the division of Medicine, 19 beds are alloted to infectious diseases; their general out-patients amount to about 70,000 per annum. Number of in-patients annually is about 5,000. The total number of operations amongst the in-patients is about 350 a year.

The hospital is very well equipped and staff is efficiently organised. Every clinical Unit has its own out-patient room, e.g. Unit of Dentistry, Unit of Urogenital diseases, etc. all occupying separate rooms in the Out-Patient Department. Thus cases can be seen without confusion. Adjacent to the admission office there is a room called the social service room. There clerks are specially employed for the purpose of recording the family history, social environment, addresses of the in-patients as well as the out-patients whenever necessary. This, I think, is of great help in obtaining medical statistics for a clinic. The clerks employed in the admission and social service office are not medical graduates; their duty is to keep records of cases only. But the clinical reports are written by the internes.

There are four theatres altogether; one for minor and one for major surgical opeations with a washing room between them, one for orthopædic surgery, and one for ear, noses throat and eye operations.

The hospital is also equipped with electrical and massage room and up-to-date X-ray plant including deep X-ray therapy. Dr. J. Heng Liu is the superintendent of this hospital. The whole medical staff excluding internes, technicians, dispensers, dressers and nurses consists of about 50 persons. Every department has a head, from 1 to 10 visiting staff, one or two residents, four to ten assistant residents.

With the help of the internes, there are about 15-20 persons in each department. The etiquette and discipline among the staff is admirable. The hospital is not used at present for teaching except for training internes and nurses. The latter are about 200 in number.

From every point of view, I must say this is the best Chinese hospital to-day. It's work and organisation may well serve as a model wherever more Chinese hospitals are to be established in future. On several occasions, I was impressed by the fact that the recent developement in medical work in China is much more marked than the

developement I saw five years ago. I wish to recommend particularly to the Chinese medical students of this University to seek for these opportunities in future, because I am sure that more qualified men will be required to spread their services all over China.

The Central Field Health Station and "Weishengshu."

(National Health Administration).

The Central Field Health Station was established under the National Health Administration in 1931. In its initial stage of developement, the National Government of China demonstrated its interest in public health work by creating the Ministry of Health in December 1928. After advice had been obtained through the Health Organisation of the League of Nations, a plan was worked out for the establishment of the Central Field Health Station. The objectives of the Central Field Health Station are:—

1. To establish experimental institutions.
2. To carry out practical field work in public health.
3. To train a technical staff.

With these objectives in view, the Central Field Health Station was then organised having the following departments:—

1. Department of Bacteriology and Epidemic Disease Control.
2. „ „ Parasitology.
3. „ „ Sanitary Engineering.
4. „ „ Chemistry and Pharmacology.
5. „ „ Medical Relief and Social Medicine.
6. „ „ Maternity and Child Health.
7. „ „ Industrial Health.
8. „ „ Epidemiology and Vital Statistics.
9. „ „ Health Education.

In 1931 a part of the building of the "Waishengshu" was reconstructed and used as laboratories of the Central Field Health Station. By the end of 1931, five of the nine departments were organised and set in operation. This present building was completed in August 1933, in the meantime, all the other departments being brought into existence.

The Central Field Health Station is as a matter of fact, a body like the National Epidemic Prevention Bureau, the National Quarantine Service, the Central Hospital., etc., directly under the National Health Administration, (Waishengshu) under the Ministry of Interior.

This building was the place where the Congress was held. It is a three storied building having many lecture rooms. All the other

rooms were occupied by those 9 departments. The people there have done a great deal of health propaganda and health education work by producing pictures, posters, diagrams and pamphlets. There was a photographic section in the station for the purpose of making scientific cine-graphic films, latern slides, etc. There was another room in which I saw all sorts of anatomical and pathological teaching specimens or models being made. I also visited the Medical Entomology and Helminthology Department. They have been doing very energetic work in the study of malaria and kala-azar. There has been only recently opened a field health station in Tsing Kwong Pu for the treatment and prevention of kala-azar. Schistosomiasis Japonicum and Clonorchiasis also form subjects for their investigations which are of the utmost interest.

The Serological Department and the Pathology Department were busier in their work because aside from research investigations, they have to do the routine examinations of any specimens for diagnosis from the Central Hospital. Very active work has been carried on in the Chemistry and Pharmaceutical Departments. Synthesized drugs have been prepared. Ephedrine, Vitamine B extracts, liver extracts, Chaulmoogra oil preparations were among the main productions. I was given samples of surgical catguts to try and to test their quality.

As a whole the Central Field Health Station really serves as a centre of learning whence most of the later developments of the medical service in China will assuredly emanate.

Sight-seeing:—

Only one afternoon was spent on sightseeing. Places we visited, were Sun Yat Sen's Mausoleum, Institute of Astronomy, Academia Sinica, and others.

The Congress was closed on the 8th of October, 1934. The delegates were then given the opportunity to join one of the three execursions touring in China. One to Peiping, one to Hankow, and one to Hang Chow.

This Congress was very well attended by delegates and members from different parts of the Far East. I am sure a large collection of worthy scientific contributions will be published at the end of this year and will be circulated to the members free of charge. This congress was the first international scientific conference that has ever been held in China.

I must congratulate the Chinese National Government, particularly Dr. J. Heng Liu, Director of the National Health Administration and his Committee for their pains-taking efforts to make this Congress such a success.

As to myself, I was deeply inspired by those people whom I met and the work which I saw during the last visit to the 9th Congress of F. E. A. T. M.

In conclusion, I must thank the University authorities for sending me as this University's official delegate to the Ninth Congress of the F. E. A. T. M. which was held in Nanking on October 2nd-8th, 1934. I deeply appreciate this privilege, as I was fortunate enough to meet many well-known medical men in China as well as from many different countries in the Far East, greatly to my own benefit. I should not forget to mention also that the University kindly paid the major part of my travelling expenses and membership subscription to this Congress for which I am further greatly indebted to them.

APPENDIX I.

SPEECH OF WELCOME BY H.E. LIN SEN,

President of the National Government of the Republic of China.

It gives me great pleasure to welcome the members of this Association to China.

The health and happiness of a people are ever enhanced by new advances in science and medicine. Toward this worthy purpose the Far Eastern Association of Tropical Medicine has made important contributions at each of the eight previous Congresses. I am confident that the Ninth Congress, now in Session and attended by the most distinguished experts and administrators in the field of medicine and public health of Far Eastern territories, will prove equally successful, and that mankind will benefit greatly from your deliberations.

May I extend to you a most cordial welcome to this country and express the hope that your stay will prove both pleasant and interesting.

SPEECH OF WELCOME BY H.E. WANG CHING-WEI, PRESIDENT OF THE EXECUTIVE YUAN.

Ladies and Gentlemen:

It is my privilege as Patron of the Ninth Congress of your Association to welcome you on behalf of the National Government of the Republic of China. You will remember that at the Eighth Congress, which was held in Siam in 1930, an invitation was extended by the Chinese Government to your Association to hold the next triennial Congress in Nanking. Because of events of extreme gravity in the Far East, the Chinese Government was compelled to suggest postponement of the Ninth Congress from 1933 to the following year. Now you have come from many countries (some of you from great

distances)—from Ceylon, French Indo-China, Hong Kong, India, Japan, Malaya, the Netherlands Indies, the Philippine Islands, Siam and the United States—to meet in our Capital and discuss, in the spirit of international concord for which you scientists are so deservedly known, the latest advances in those branches of human endeavour which have as their object the alleviation of suffering and disease.

The countries here represented are more or less subject to tropical diseases and are equally interested in their preventive measures as well as their curative remedies. They are thus united by a common cause in the interest of humanity.

It was a little over three hundred years ago that Western Science was brought to the East and modern medicine has been in China for less than a century. Since the establishment of the National Government, China has spared no effort to reform and establish various medical and health organisations; and the result of such efforts is now manifest.

I see before me a distinguished company consisting of many of the greatest medical and health administrators in the Far East—delegates of Governments and institutions, and workers in the wide field of tropical medicine. You all know that it is the first occasion that your Association has selected this country as the meeting place for its deliberations. and this may therefore be regarded as an event in the history of science as well as in the history of our country.

Ladies and Gentlemen, you are doubly welcome to this country. You will be able, I hope, apart from the serious purpose of exchanging information concerning the latest discoveries in the realm of medical science, to see something of our work and of the life of our people. The personal contacts you will make during your stay in the Capital and your visits to some of our cities will certainly prove beneficial to those of my fellow citizens who are fortunate to meet you.

It is now my privilege, while bidding you welcome to these shores, to declare this Congress open to express to you the best wishes of the Chinese Government and people for the success of your deliberations and of your brief sojourn in this land.

PRESIDENTIAL ADDRESS TO THE NINTH CONGRESS, FAR EASTERN ASSOCIATION OF TROPICAL MEDICINE

by

J. Heng Liu, M.D.

Director of the National Health Administration and of the Central Field Station, National Government of the Republic of China.

With the advance of civilization medical science has steadily undergone vast changes so that there is now no comparison between what

it is doing for the world at the present time and what it did one hundred or even fifty years ago. The most important change perhaps is the practical application and utilization of the new sciences known as Preventive Medicine, Personal Hygiene and Public Health. Even with the knowledge of modern therapeutics medical science would not be what it is to-day if it is still confined to the treatment of the sick. It is true that to a large extent the work of the medical profession of to-day is still the treatment of disease, and it will probably be so still for many, many years to come, but as civilization progresses more preventive measures are applied and newer methods of prevention are discovered, thus making more and more diseases preventable and gradually making others disappear entirely.

It is an unfortunate fact that progress does not take place simultaneously in all countries, or in all parts of the same country. Many regions are not adequately supplied with health protection or medical service and others are even without any modern hospitals or doctors. This is particularly true in the Far Eastern Countries where, as a consequence, perfectly preventable diseases are still epidemic or endemic. Cholera, small-pox, typhus fever, typhoid fever, bubonic plague, leprosy are some of the diseases which might have disappeared entirely from the face of the earth if all countries had made full use of the present knowledge of Preventive Medicine, Sanitation and Public Health. The persistence of these diseases in our communities is due primarily, I think, to the inadequate protection which our governments have been able or willing to provide. But in order to give the necessary protection, one must have personnel, institutions and funds. Under personnel I include doctors, nurses, pharmacists, dentists, midwives, sanitary engineers and inspectors, and propagandists. Under institutions, I include hospitals—particularly for isolation, maternity homes, sanitaria, diagnostic laboratories, quarantine stations, health stations and rural health centers and various clinics and dispensaries. It is, therefore, not an easy task to make all the provisions within a short time. All of us here to-day I am sure realize our great responsibilities. We must obtain the funds, create the institutions and train our workers. Until we have these three conditions fulfilled to a certain extent it seems useless to even talk about Public Health.

As Director of the National Health Administration of China and of the Central Field Health Station, I wish to-day to say a few words in regard to the work we have been doing in this country. I have to confess that there is a wide gap between the prevention and treatment of disease and what is actually applied and utilized. No matter how justly proud we may be of our famous physicians and surgeons of previous centuries and millenniums, we have lagged behind and made very slow progress since medicine ceased to be empirical and became a science. In the same way that our former governments

have neglected to fully utilize modern inventions and discoveries in the physical sciences so also very little was done in the domain of modern medicine and public health. Railways, motor-cars, wireless telegraph, modern machinery and other recent inventions and discoveries of modern science were all very slowly introduced into our country. Modern scientific medicine was no exception and our progress was therefore very slow until the revolution which overthrew the Manchu dynasty. Since then the country has had political upheavals of one kind and another so that a real programme of national reconstruction was not worked out until very recently. Even now progress of every description is not as rapid as we might wish.

Many have asked why this Congress was not held in Shanghai or Peiping. Shanghai has its conveniences in hotels, communications and other matters of interest. Peiping has its cultural institutions, palaces and monuments. But the government chose Nanking in order to demonstrate to the delegates its recent efforts in national reconstruction. While the defunct Peking government had only two public health institutions, namely the National Epidemic Prevention Bureau and the Manchurian Plague Prevention Service, the National Government, since its establishment in Nanking in 1927, has created the following new institutions, entirely supported by the Central Government:

National Health Administration (Weishengshu) of the Ministry of Interior.

Central Field Health Station—under the National Economic Council.

National Quarantine Service.

Central Hygienic Laboratory.

Central Midwifery School.

First Midwifery School, Peiping.

Central Hospital.

Central School of Nursing.

It is the desire of the government to show that even during this period of the world crisis, and of political turnoil in this country, the government has earnestly tried to catch up with modern times. It is on our programme during the next few days to show you as many as possible of these institutions and the work that is being done in them.

I wish particularly to call your attention to the work of the Central Field Health Station and of its nine technical departments. They are described in the "First Report of the Central Field Health Station" and in the "Pictorial Survey" which have been presented to you.

The Station is now the technical headquarters of the present and future Health Service of China. From the beginning technical advice has been sought from the Health Organization of the League of Nations so that the work of the Station would be in accordance with the most modern ideas and standards. During its brief existence of three years, considerable progress has been made in all the activities mentioned in its original programme, particularly in investigation and control of communicable diseases, health education, school health, maternity and child welfare, provision of medical relief and establishment of rural health centers. Perhaps the most fundamental contribution to the nation is being made by the training courses which are given by the Station for all kinds of technical personnel. It is in fact a School of Hygiene giving training to medical and sanitary officers, bacteriologists, parasitologists, pharmacologists, school health workers and technicians of every description.

In addition to these national institutions the provinces and the large cities are also undertaking new activities in public health and medical work. Newly established health departments and bureaux containing technical institutions such as hygienic laboratories, health centers, midwifery schools, clinics and hospitals are springing up rapidly.

In all this work we are constantly faced with difficulties. The size of the country, the large population, the existence of old traditions and superstitions and financial stringency are all factors which make progress slow and difficult. But as pioneers in this new field in China we are looking at the future with optimism. We have at the moment a nucleus of twenty-four modern medical schools and a force of over six thousand registered modern-style physicians. Two hundred odd missionary hospitals and several hundred more other hospitals are additional forces which we are counting upon in our efforts to provide medical protection for the people.

Now a few words in regard to our Association, which has been in existence for twenty-six years. Among its objects as enumerated in the Constitution are (*b*) the union of the medical profession of the Far East into one compact organisation and (*d*) the promotion of friendly international intercourse between scientific men. It should be the keynote of this Congress to promote these two objects. After all our problems are very much the same, and the more intimate our relations are with one another the better it is for all of us. In recent months China has sent doctors to Manila, Indo-China, India, Singapore, and the Netherlands East Indies to study special problems such as rinderpest, kala-azar, malaria, etc. On their return they have always reported the exceedingly cordial reception they have received from their foreign colleagues and the great benefit which they were always

able to obtain. The League of Nations and the Rockefeller Foundation can perform no greater service than to make possible more of these interchanges or fellowships.

It is time that the nations of the Far East unite themselves as far as the medical profession is concerned. I have been very much gratified in the whole-hearted way that the health authorities of the three governments of Shanghai-International Settlement, French Concession and Municipality of Greater Shanghai—have worked together in the campaign against cholera since I called the first cholera conference in 1930. The work of the Eastern Bureau of the League of Nations in coordinating the work of the quarantine services of different countries is another example of what international co-operation could accomplish. I venture to recommend to the Congress, therefore, that more effective emphasis be placed on the international aspects of our work.

Before closing, I wish to thank the members for the honour of being elected to the Presidency of this Congress and to express officially the great privilege of serving as host of our Ninth Congress. Besides fulfilling the objects mentioned in our Constitution, I have no doubt this Congress, which has just now been declared open, will confer a lasting beneficial effect on medical progress in the Far East in general and in China in particular.

APPENDIX II.

CHOLERA ROUND TABLE RESOLUTION.

I. This Congress, having discussed the question of "carrriers" of cholera is of opinion that further investigation is desirable and recommends that such investigation be carried out in the countries of the Far East as and when opportunities arise.

II. This Congress, having discussed the question of the protection conferred by the anti-cholera vaccine, is of the opinion that further statistically controlled field tests be carried out especially in those countries where such controlled tests have not yet been done.

III. This Congress, having discussed the question of the relationship between the cholera vibrio and allied vibrios and their variants, is of the opinion that further study of this problem is desirable and that as far as possible the workers on this subject in different countries should exchange available information in order to correlate the results obtainable by the different methods employed.

IV. This Congress proposes that further field and statistical work be carried out in order to obtain more exact information than at present available regarding the epidemic and endemic areas for cholera in the Far East.

PLAGUE ROUND TABLE RESOLUTION.

I. Whereas at the Eighth Congress held in Bangkok 1930, a resolution was passed strongly recommending rat-proofing of vessels as a practical means for preventing the spread of bubonic plague, and Whereas the value of this method has been amply demonstrated as a means of reducing and keeping rat-population of vessels to a minimum,

Now therefore be it resolved

(*a*) To bring to the attention of all the constituent Governments the urgent advisability of adopting practical measures for the rat-proofing of vessels; and

(*b*) That serious attention be given the question of how far similar methods could be employed to keep railway systems free from rat infection.

II. Be it resolved that in addition to rats and their ceas due attention be paid to other rodents and fleas, particularly *pulex irritans* capable of spreading infection.

A RESOLUTION

URGING THE NEED FOR CO-OPERATIVE INTER-NATIONAL INVESTIGATIONS OF THE BIO-CHEMICAL CHANGES OCCURRING IN THE BREEDING PLACES OF ANOPHELINE MOSQUITOS, WITH A VIEW TO STUDYING THE EFFECT OF SUCH CHANGES IN LIMITING THE TRANSMISSION OF MALARIA.

The Malaria Section of the F.E.A.T.M. (9th Congress) recognising the pressing need for co-operative investigations in the problems of malaria control wishes, in particular to emphasise and direct attention to the fundamental importance in malarial epidemiology of studying bio-chemical changes occurring in the breeding places of anopheline mosquitoes.

The Malaria Section of this Congress considers that advances of practical utility in the control of malaria might be made if the data obtained by workers in the countries of the Far East were made comparable.

It is resolved, "that, with the consent of the Governments concerned, such investigations, conducted in various countries, be co-ordinated through the appointment of a joint committee of chemists and malariologists resident in these countries."

It is recommended that this Committee should be invited to formulate the general lines upon which bio-chemical investigations shall proceed, and that they should be asked to report to the Director of the League of Nations Far Eastern Bureau concerning the principles and methods

of study which are likely to be most profitable, and from time to time concerning the results they achieved.

The Malaria Section in submitting this resolution for consideration by the members of the 9th Congress recommends that experts be requested to serve as honorary members of this Committee, two representing the Netherlands East Indies, two representing French Indo-China, two representing British Malaya.

Furthermore, it is suggested that this Committee be empowered to co-opt other workers experienced in this field of study so as to extend this investigation throughout the countries of the Far East.

THE PROBLEM OF DEPOPULATION WITH SPECIAL REFERENCE TO BRITISH NORTH BORNEO.

by

Lindsay T. Ride.*

(Professor of Physiology, The University, Hong Kong).

While on scientific expeditions in Borneo in 1931 and in 1932 for the purpose of collecting blood grouping and other genetic and anthropological data, family histories were taken concerning some 3,000 natives. These natives were drawn from districts some of which, according to the Census, show an increase, and others, a decrease in population during the last ten years. Although the study of the question of depopulation was not one of the principal aims of the expeditions, nevertheless the data collected may provide reasonable material on which to base a discussion on this important subject. One gathers that the multiplicity of suggested causes for depopulation found in the Pacific is only equalled by the disagreement of observers as to the real causes. While it is reasonable to suppose that there are, in reality, many causes acting, and that these causes may vary with local conditions, it is just as reasonable to suppose that if there be any fundamental causes, they will be common causes, and will be found operating in the large majority of the cases in complete independence of whether secondary causes are acting as well or not. It is therefore proposed to take a number of factors which are generally considered to be important in the Pacific Islands, and to see which of them, in one's limited experience, also apply in North Borneo. It will be argued that those which are found to apply in the widely different conditions existing in both the Pacific Islands and in North Borneo, may be considered to be among the more fundamental and primary causes of depopulation of native races in general.

Data Concerning British North Borneo.

On page 9 of the 'The Report of the Census of the State of British North Borneo, 1931.' (2), are given the percentage increases or decreases of the native population compared with 1921 in the various districts of that State. In Table I are reproduced the figures which apply to nine of these districts which were visited by our expeditions.

* The original paper, of which this present essay is an amplified and more complete form, was read at the International Congress of Anthropological and Ethnological Sciences, London, August, 1934.

TABLE I.

District	*Increase.*	*Decrease.*
Jesselton, Suburbs & District	108.49%	—
Sandakan, Suburbs & District	47.93%	—
Kotabalud	28.18%	—
Tenom	27.14%	—
Tambunan	0.94%	—
Keningau	—	18.59%
Tuaran	—	8.08%
Kinabatangan	—	2.24%
Kudat	—	0.24%

In the Report various reasons are given for these figures—some are explained by administrative rearrangement of boundaries, others by changes in ethnic nomenclature, while some of the decreases are left unexplained. It is interesting to compare the data in Table II with that above. These data cannot and must not in any way be looked upon as supplanting or even supplementing the Census figures, because they were taken merely as secondary information during the routine blood grouping, and by no means was every person in a kampong examined. Though incomplete, the figures should constitute good random samples.

The following was the information (relative to the subject under discussion) which was elicited from each of the natives examined:— status (single, married, widow or widower, or divorced), number of children (if none, the number of years married was noted, and information concerning only those married for one year or more without a resulting pregnancy was used in our tables; if married more than once the number of children resulting from each union was treated as a separate mating; the number of children dead was not noted earlier in the investigations hence while the living children per family should be fairly accurate, the number of births is almost certainly too small).

As stated above these figures should be good random samples, especially where they deal with the inhabitants of a kampong which was actually visited. There, one was no more liable to examine an adult with a family than to examine one without; but it may be argued where the natives came from distant kampongs, the number examined would tend to include more single persons, and more persons without child encumberances or family responsibilities. That may be so, but it is doubtful. In such cases, children actually turned up in large numbers

probably out of mere curiosity, and where only one parent came, the data concerning family size were still obtainable. Although the method of obtaining these data may mitigate against its accuracy, the same factor will modify each group of results in the same way, and hence should not affect the *comparative intertribal value* of the data.

TABLE II

Administrative Districts.	*No. of Matings.*	*Mean Number of Living Sibs per mating.*	*Standard Error of Mean.*	*Percentage Change in Population (Census).*
Kota Belud	179	2.3	.12	+28.18%
Tambunan	249	1.7	.11	+ 0.94%
Keningau	419	1.1	.07	− 18.59%
Kinabatangan...	56	1.8	.25	− 2.24%

Table II, setting out the data collected concerning the size of families in certain of the Administrative Districts mentioned in Table I.

It is obvious that in order to prevent a fall in the population, the average family size must be at least 2.0. From Table II it is seen that in Kota Belud an increase might be expected, in Keningau a definite decrease, while taking the standard error of the size of family into account, either a rise or a fall would be compatible with the results from Tambunan and Kinabatangan, with a fall the more likely. Glancing at the last column of Table II it is seen how closely these data and the census returns correspond and this agreement between the figures given is taken as evidence that the data collected contain reasonably accurate samples of the various parts of the community as a whole.

In Table III we see the results of comparing the family size of the different Administrative Districts mentioned in Table II and it is seen that all the differences are significant except in the case of those involving the Kinabatangan District. The difference between this district and that of Keningau is significant but the data are not sufficient to establish a significant difference (if it exists) between the Kinabatangan and the other districts.

TABLE III.

Administrative District.	Kotabelud	Tambunan.	Keningau	Kinabatangan
KOTABELUD	—	Difference Significant	Difference Significant	? Significant
TAMBUNAN	Diff. = .58 S.E. = .16	—	Difference Significant	Not Significant
KENINGAU	Diff. = 1.18 S.E. = .14	Diff. = .60 S.E. = .13	—	Difference Significant
KINABATANGAN	Diff. = .56 S.E. = .28	Diff. = .02 S.E. = .27	Diff. = .62 S.E. = .26	—

Table III in which are set out the differences (Diff.) between the average size of family in the four Administrative Districts, the standard error (S.E.) and the significance of these differences.

TABLE IV.

Administrative District.	*No. of Matings.*	*No. of Childless Matings.*	*Childless Matings %*	*Standard Deviation for the Percentage.*
KOTABELUD	179	25	13.97	2.6
TAMBUNAN	249	71	28.51	2.9
KENINGAU	419	186	44.39	2.4
KINABATANGAN	56	17	30.36	6.1

Table IV, giving the data collected concerning childless matings, their percentage occurrence and the standard deviation of these percentages.

Table V. Here the data previously given under administrative districts are amplified according to locality and tribes, the number of births per mating and the percentage of sterile matings being given as well as the average size of existing families and the percentage of childless matings in each group.

TABLE V.

Tribe and Location.	*No. of Matings.*	*Mean number of Births per Mating.*	*Standard Error. of mean*	*Sterile Matings %.*	*Standard deviation for percentage.*	*No. of Matings.*	*Mean size of Family.*	*Standard Error. of mean.*	*Childless Matings %.*	*Standard deviation for percentage.*	*Percentage change in population (census).*
Bajaus (Kota Belud)...	21	4.5	.83	4.8	4.6	21	3.1	.38	4.8	4.6	+ 20.36
Dusuns (Kota Belud)	80	2.3	.20	16.3	4.1	102	2.0	.15	14.7	3.5	+ 26.06
Dusuns (Bundu Tuhan)	37	2.3	.33	21.6	6.8	37	1.9	.31	24.3	7.1	
Dusuns (Ranau)	124	1.8	.19	32.3	4.2	124	1.3	.13	41.9	4.4	+ 0.97
Dusuns (Tambunan)	95	2.5	.22	16.8	3.8	116	2.0	.15	20.7	3.8	
Kwijaus (Keningau & Apin Apin)	76	1.8	.18	17.1	4.3	76	1.5	.17	28.9	5.2	+ 190.26
Muruts (Keningau & Apin Apin)	169	1.3	.11	36.7	3.7	169	1.1	.10	45.6	3.8	− 50.76
Ulun (Bokun Muruts)	209	1.3	.09	34.0	3.3	225	1.1	.10	46.7	3.3	

Again the data fits in well with the census returns which showed that Keningau, which we see has the highest percentage of childless matings, has also the greatest percentage decrease in population. In order to see whether any further light could be thrown on the distribution of the decreasing populations, the above data were further split up, and in Table V we find the figures set out according to tribes in some cases, and localities in others.

Discussion of Data.

In discussing the data of Table V it should be pointed out that the figures concerning the number of births per mating and the percentage of sterile matings are not as trustworthy as those found in columns 6—10 dealing with the average size of existing families for the following reason. Often when taking the history of a mating which had produced children one was content to note the number of children living and not to ask for the total number of pregnancies or of the number of children dead. Such families are included in columns 6—10 only, but where there were no children alive one nearly always asked for further information concerning the number of children dead and the total number of pregnancies. Only those families subjected to this further interrogation are included in columns 1—5, but by this method a childless mating had more chance of being included in the first half of the table, and thus this half does not strictly contain random information. The sterile mating percentages are therefore almost certainly too big and the average number of births per mating too small.

This is perhaps unfortunate, for had the information of columns 1—5 been taken in all the cases included in columns 6—10, one could have discussed the relative contributions towards the depopulation of infantile mortality and sterility. But as stated above, this problem was unfortunately not one that we had in mind when we embarked on the expedition; the value of such data may well repay the additional time and energy necessary to collect them on some future occasion.

At first sight it may appear that the percentages of sterile and childless matings are far too high, for surely one half of the Bokun Murut married couples are not childless. But it must be remembered that these data included *all* matings entered into by each individual examined. For example, if 'A' has been married four times, having no children by any of his first three wives, and four children by the fourth, this fact is shown as four separate matings. A casual observer sees only the present mating with the four children, and does not appreciate the three previous and hidden childless matings. This state of affairs was found to be very common, no children apparently being very good grounds for divorce, or rather an excellent reason for a man to divorce his wife. Incidentally the frequency with which this was encountered leads one to conclude that the desire to have children is still pronounced amongst these natives, an important point to remember when considering the lack of this desire as a common cause of fall in population amongst such people.

Table V shows that the tribal variation in size of family and sterility corresponds with the variation of the population except amongst the Kwijaus and the Kotabelud Dusuns. The tremendous percentage increase of the former is explained in the Report as being due to the difficulty of accurate racial classification, some of the natives being classed as Muruts in 1921 and as Kwijaus in 1931. The discrepancy between our figures as far as the Kotabelud Dusuns are concerned is due to the fact that those examined were mostly from the small kampongs of Kabayau, Koung and Dallas, and this can hardly be held to form an accurate specimen sample of the larger communities which contributed to the 13,528 people enumerated in the Census. This Table also illustrates a very important point that in North Borneo the depopulation seems to be more marked in tribes which consist of small scattered and more or less isolated communities. The average size of family was 2.0 or more in three places, (*a*) amongst the Bajaus in Kota Belud, (*b*) amongst the Dusuns at or near Kota Belud (these figures include those from Kabayau, Koung and Dallas) and (*c*) amongst the Dusuns of the Tambunan plain. With these may be classed (*d*) Dusuns at Bundu Tuhan. All these people live either in relatively large communities or in localities were trade routes ensure a good deal of meeting with folk from distant tribes or kampongs. Further inland where the villages are more isolated and more removed from constantly used trade routes the family size is smallest. It is my opinion that amongst these isolated tribes there is a definite amount of inbreeding which may adversely affect the birth rate, but in those tribes living in large communities (e.g., the Dusuns on the Tambunan plains) or in close proximity to well used trade routes, this imbreeding is to a large extent countered by the outside mating which must invariably follow these more frequent intertribal meetings. Isolation leads to inbreeding and inbreeding diminishes the frequency of those character variations on which depends the ability of a community to survive changes in environment.

Depopulation Causes in the Pacific and in North Borneo Compared.

Let us now consider some of the factors which are generally considered as being most important in the process of depopulation in the Pacific and see what their comparative values are in North Borneo.

1. DISEASE.

Disease is claimed to be a causative factor in depopulation in the Pacific Islands mainly on account of the introduction by Europeans of measles, tuberculosis, influenza, dysentry, venereal disease etc., among races previously free from them. Owing to the absence of any degree of acquired immunity, epidemics of such diseases have resulted in appaling increases in death rate. Such a factor generally acts in a dramatic fashion, the acute diseases decimating whole families and tribes. If whole tribes are wiped out, the immediate depopulation will obviously

be permanent; if it effects the people independently of age, the population curve will suffer an immediate marked drop, but after recovery, the old rate of change of population will be re-established and if that rate of change be positive, in course of time the number lost will be replaced. If the effect has been more marked on the children, then the interference with the individuals who are to provide the future families will result in a more lasting fall in population. North Borneo like the Islands of the Pacific, has suffered gross reductions in population by such epidemics. Early in this century, small pox, followed a year later by cholera, swept through the country. In the post-war influenza epidemic, thousand are said to have died, and again, the introduction of a new type of malaria by indentured labour from Java is claimed to have wrought havoc amongst some of the local tribes folk working on certain estates. In the absence of accurate statistical data regarding these epidemics it is impossible to state whether the effect is still being felt but it may well likely be that it is.

As stated above, after an epidemic—which has not unduly interfered with the future population producing individuals—has died down, the normal growth of population continues, but at a new level. Such epidemics do not usually disappear completely, but leave in their train sporadic cases, and the diseases becoming endemic, confront us with a very different proposition. These cases, together with chronic diseases such as yaws and malaria definitely cause depopulation, and they do this, not so much by an actual increase in the death rate, but by lowering the vitality of the individuals. They not only become a more easy prey to intercurrent infections (the death rate thus being directly increased), but their powers of procreation are reduced, thus lowering the birth rate, and this latter effect is the more important and more lasting, in that it affects the future generations as well. There is no doubt that this factor is operating in North Borneo as elsewhere, but fortunately it is one which modern medical services are slowly but surely learning to combat.

2. SOCIAL POISONS.—Alcohol, opium etc.

The strong spirituous liquors of the European which have been suspected of causing so much harm amongst Pacific natives can hardly be held to blame for the depopulation found amongst the Muruts in North Borneo. The tribes in the interior have not been 'civilised' to the stage of indulging in this type of alcohol. They have however their own type of alcoholic drink—tapai—made generally from rice, but that failing, they also make it from other sources e.g., Indian corn, tapioca or potatoes. It is made by a process of fermentation, and this, together with the fact that the huge jar from which it is drunk is continually replenished with water during the process of drinking, ensures that it is not of a very high alcoholic content. The males and females, young and old partake of this drink freely at celebrations which are held frequently and on the slightest provocation. Excessive tapai drinking

may conceivably affect the birth rate by undermining the health of the natives, but it is doubtful whether its prohibition would have any better effect, interfering as it would with the social customs, a question to be considered in the next section. Furthermore, this long established custom can hardly be seriously held to account for depopulation of recent origin alone; the change it causes must be as long-standing as the custom itself. On the whole, it is difficult to see how tapai drinking can be considered as anything but a secondary auxiliary factor at the most in the causation of depopulation. Amongst these tribes, the opium question, fortunately, does not exist, and betel-nut chewing is such a universal custom throughout this part of the world that it cannot be held responsible for the decrease in population shown by a few isolated North Borneo tribes.

3. SOCIAL CUSTOMS.

(*a*) *Clothes.* Amongst certain races the introduction of European clothes is supposed to have had disastrous consequences. These races were not used to wearing anything more than a loin cloth, and were thus not aware of the importance of changing extra clothing when wet through; in fact an individual rarely possessed more than one suit. This frequent wearing of wet clothes together with the insanitary custom of wearing them unwashed till they practically fell to pieces, was doubtless frought with serious consequences to the wearer's health. In North Borneo, numbers of tribes have their own native costumes, formerly made of bark and now of cloth; hence any change to European types does not necessitate a change in customs with which the native cannot cope. Amongst the interior tribes, native dress customs are still most commonly followed, and yet it is here that depopulation is most marked; but near the coast where European clothes are more commonly seen, depopulation does not exist. Clearly then, this is a factor of no great moment in North Borneo's depopulation problem.

(*b*) *Housing.* No one who has lived in native buildings in North Borneo could go so far as to assert that they are highly sanitary. Light comes through the only entrance—the door; there are no windows, but in some cases the houses are fitted with a type of shutter which can be raised; draughts can enter through the floors and walls almost anywhere, but they fail to reduce the heaviness of the atmosphere due to the whole village living and sleeping in one hut, and to the absence of chimneys; filthy dogs have access everywhere, and if there are any rules regarding spitting, they must concern the immediate bodily comfort of the spitter rather than the general comfort of his neighbours. Such a state of affairs is by no means ideal according to our ideas, but housing conditions have been considerably improved of late and the change from age-old insanitary conditions to better ones can hardly be held to account for recent depopulation. If it were a long standing depopulation we were

considering, these conditions would be more important factors to consider.

(*c*) *Institutions.* With the coming of European ideas of law and order many native customs have been either modified or abolished. In common with many South Sea Islanders, the Muruts of North Borneo have had to give up their practice of head hunting and when one sees the listless and lazy type of life that these natives now live, one realises the pity it is that nothing has as yet been devised to replace what was almost their sole 'raison d'être'. In the Pacific it is stated that where Christianity has been able to make up this deficiency, the tribes flourish; where it has not, they disappear. There, apparently, the head-hunting custom involved months and even years of boat building and training with which no modern boat race could possibly compete. The training period was apparently a very busy time for every one—rowers, fighters and the native counterparts of seconds and newspaper reporters alike. There was a great incentive to breed a family of youths who could take an honourable part in such a conflict. In North Borneo on the other hand, authoritative descriptions of head hunting activities leave one with the idea that it often entailed nothing more than beheading isolated and defenceless women and children; this was so at any rate in the early stages of a fued, and even in the later stages when the warriors were involved, the fighting consisted mainly of ambushing a few hunters from the enemy tribe—a type of battle which demands no great periods of systematic training. Lack of general fitness may reflect itself in lessened procreative faculties, but the disappearance of such customs in Borneo cannot be considered to have caused such deterioration in the physique and general fitness of its natives, as such a disappearance is claimed to have caused in the Pacific. It may however be quite reasonably claimed to produce a psychological effect by the removal of one of the zests for life, an effect of enough importance to demand separate consideration.

4. PSYCHOLOGICAL FACTOR.

In the last chapter of "Essays on the Depopulation of Melanesia", W.H.R. Rivers (3) deals at length with this factor, but it is quite obvious from the examples he gives that the loss of interest in life is not itself a primary cause of depopulation, but the result of other causes. 'A native who is ill loses heart at once' he says. Exactly. The illness produces the unfavourable psychological attitude. Some other factor such as ill health, insufficient nourishment or interference with important social customs is necessary to produce this unfavourable psychological condition, and once produced, the effect of the primary cause is greatly increased, and thus a vicious circle is created. The psychological condition is a symptom of a more deep-seated disease and it is the disease which demands treatment and not the symptom. Treat the disease successfully and the symptoms will disappear. Rivers in his chapter proves the

symptomatic nature of this psychological condition by the type of treatment he recommends. He would, in addition to rectifying bad sanitary conditions, faults in housing, clothing and feeding, restore their old social customs in a form compatible with European ideals. In other words, he would treat the psychological factor by dealing with the real causes; and thus is revealed the true nature of this factor—it is an *effect* of the real factors, the second step in the vicious circle; it is thus a secondary, and not a primary, factor.

5. FIRE ARMS.

The introduction of fire arms is definitely a negligible factor in North Borneo. It must of course effect the lives of the hunting Murut tribes, but in which way it is hard to say yet. As to making the causality lists of inter-tribal disputes heavier, such a state of affairs was only a possibility in the past. At the present such a state does not and cannot exist, due wholly to the wise native policy of an efficient local Government.

6. NUTRITION.

Do the natives partake of a diet efficient in calories, variety, minerals and vitamines? Thorough investigation of this question would well repay those who make the welfare of these tribes their life's work, as well as those who are financially interested. A short stay with these natives is not enough to allow of a definite opinion being formed, but it was sufficient to lead to the impression that the bodily intake of the average native was very little more than sufficient to supply his basal metabolic requirements. He lives very close to the nutritional border line, dangerously close; and this being so, one can readily understand why he falls an easy prey to any epidemic, especially if what reserves of energy he is fortunate to possess are already taxed by chronic ill health due to malaria, yaws or dysentry.

But in searching for the cause of depopulation of recent origin, we must try to ascertain whether the native diet differs markedly from that of his forefathers. If not, then the depopulation if due to malnutrition should be no new thing. And again, why should the natives partake of an insufficient diet? When there is no food shortage, it simply means he is too lazy to hunt until he is compelled to do so, too unenterprising to lay by a store of food for bad times. This condition is simply the result of his psychological state and thus we unearth the next factor in the vicious circle of causes. Treat the primary causes of the unfavourable psychological state and this nutritional factor will most probably disappear also, always provided that the food, and the facilities for obtaining it are there.

7. CELIBACY.

On page 60 of the North Borneo Census are given the percentages of adults who are married, males and females being given separately.

The districts of Keningau and Pensiangan where depopulation is most marked show the highest marriage percentages. In fact, only two of the districts which show a decrease in population since 1921 have a percentage of married adults less than the average for the whole population. From the above data in Table V we see that the Keningau Muruts show the smallest number of births and of living children per mating, and also give the highest percentage of sterile and childless matings. This would make it appear that celibacy is not a factor here, but that factors effecting fertility and child mortality are more important.

8. CONTRACEPTION, ABORTION, INFANTICIDE.

North Borneo provides no exception to the belief that native women have their secret and perfect methods of contraception and of procuring abortion, but only officers of long personal experience and who have won the absolute confidence of the natives, can possibly give us the accurate information we should like on these points, and then the information must be comparative; we must know whether these practices are on the increase or not; then and then only can we assess the value of such practices in the causation of recent depopulation.

9. STERILITY.

Sterility may be either secondary or primary. By secondary one means a condition whose cause can be explained as being due to disease such as gonorrhœa (which acts locally on the generative organs) or to chronic disease such as tuberculosis, malaria, yaws, dysentery, which act by causing general debility. There is no doubt that sterility may be an important factor in North Borneo, as shown by the above mentioned data, and its effect as well as its frequency will be greatly increased if the natives exist on a borderline diet. By primary sterility one means that type for which we can offer no satisfactory scientific explanation. Such cases are well known to medical science, and when the parties concerned are examined, no abnormality whatsoever can be demonstrated which would account for the condition, and although an efficient examination of natives along these lines is well nigh impossible, one would suspect from the data given that it is present in a high degree. Quite frequently one came across natives who had been married three or four times and in each case with the same result—neither children, nor pregnancies.

10. INFANT MORTALITY.

Accurate figures on this point are very hard to get, and the above data can hardly be considered accurate enough or sufficient to allow of an opinion being formed, but they do indicate that this, operating on an already small-sized family population, may be an important contributary cause of depopulation.

11. INBREEDING.

Of the physiology of primary sterility we know practically nothing; but we do know from experimental work that sterility is a danger that commonly threatens stocks which are being closely inbred. Inbreeding as a cause of declining population has often been suggested, but is now generally discountenanced by modern writers; but that the last word has been said on this subject one cannot believe. Inbreeding does not necessarily cause sterility anymore than it causes albinism; but it is the one method by which sterility and lethal factors, if present in a race, can be given the opportunity to appear in greater numbers. We have already seen that the tribes showing the biggest decrease are those living inland, whose opportunities to mix with other tribes are reduced to a minimum, and whose size of community is small. In the Murut country especially is this so.

Through the kindness of Mr. C. R. Smith who was Resident of the Interior in 1932, one is able to give the approximate population of kampongs near Keningau. The total population of the 11 villages in the vicinity of the Keningau station was 1309 giving an average of 119 per village. In the 16 villages about 7—9 miles from the station there were 1781 people, an average of 111 per village, while in 8 Bokun villages there were 870 people, and average of 109 per village. Dahlberg (1) has shown that a population can be divided into part populations which he calls 'isolates' and it is only within these that absolute random mating can be assumed to occur. He has also calculated the size of an isolate at which the result of random mating does not differ from that of 'panmixie'. In a country with a large population the isolate is large enough to give the same result as panmixie, and hence consanguineous marriages have no effect on the population. In Western Europe the size of the isolate is between 400 and 3000. From the kampong figures just quoted it is seen that the size of the isolate among the Keningau people must be much smaller than that in Europe; in fact in the Bokun Murut kampongs which we visited we saw only 148 male and 126 female children and unless these individuals marry outside, a male has less than 126 females from whom he may choose his mate. This must inevitably lead to inbreeding; but what is just as important as the size of the isolate, is the fact that whereas in countries with large populations (Europe for instance) no two isolates are coincident, even the isolates of two brothers being very different,—amongst tribes small and isolated as these in North Borneo are, the isolates of all the members of one generation must be practically the same and therefore the liability of inbreeding to occur must be enormously increased, in fact it must be inevitable. And that is why the larger tribes and those living near the coast, where there are increased facilities for travel, and where there are consequently larger and more variable isolates, do not show any signs of inbreeding, whereas the

moment we come to examine the smaller tribes of the Muruts, inbreeding must occur.

This however would explain depopulation only, and not depopulation since the arrival of Europeans and we are therefore up against the old question of whether the reduction in population we are witnessing is a new thing or not. It cannot be doubted that statements made by explorers as to the large numbers of natives they encountered are true, but such statements cannot be accepted as trustworthy evidence in these days. Accurate statistical data comprise the only evidence which we can readily accept to form our conclusions and unfortunately data referring to the pre-European period do not exist.

Biological history is full of instances of the price paid by races, both plant and animal, which cannot cope with a change in environment, and it is surely certain that some primitive tribes must in the ordinary course of events be undergoing a reduction in population. The reason why all small tribes do not show this phenomenon is that mere inbreeding is not enough; there must be accompanying it selection, and in the ordinary natural course of events the characters being selected must vary not only from tribe to tribe but from time to time in the same tribe. For example, where a few generations ago prowess at headhunting may have been important in selection, nowadays that character may be replaced by shall we say the ownership of a large number of gongs or buffaloes. A large population of heterogeneous individuals ensures that a change in environment will be successfully met by the survival of at least a percentage of the population, whereas a population of relatively homogeneous individuals—such as may be produced by continued inbreeding and selection—stand less chance of successfully negotiating a marked environmental change. The large populations of India and China, and even the large tribes of North Borneo e.g., the coastal Dusuns or those on the thickly populated Tambunan plain, are still heterogeneous enough to react favourably to European contact, whereas the small isolated tribes fail.

Conclusions.

Of all the factors put forward by the workers amongst the Pacific Islands, the only ones which are of importance in North Borneo are malnutrition, disease and inbreeding, and in my opinion these factors bring about their bad effects of depopulation by working on tribes not genetically equipped to react favourably to a new environment, and therefore the reason of decrease in population is fundamentally one of genetical constitution influenced by other secondary factors, which factors may vary in importance from place to place and from time to time. If these ideas are correct what is the solution? The *race,* as at present constituted, cannot be saved, but the *population* can. Modification of the secondary factors by thoroughly investigating and, if necessary improving, native diets and sanitary conditions, by replacing illegal

customs by just as important harmless ones etc., will certainly help, but in the worst cases the race will not be saved because it is being called upon to accomplish a task for which it has not been equipped. But the population can be saved by operating against the prime cause of the trouble and this can only be accomplished by introducing new blood. This, of course is an old method and one that has fallen into disfavour because it has been tried and has failed. The new tribes have fallen prey to the very diseases etc., which caused the older tribes to die out. But surely that just adds more proof to this genetical theory put forward because it was an attempt to maintain the population with new material which was just as incapable of combating the conditions as the old material was. Any new infusion of blood should come from tribes that have proved themselves to be capable of surviving the changed environment. By this means and this only will the population be saved, and when all is said and done, this is merely the way that nature itself copes with these problems.

The examination of this question as it effects North Broneo has of necessity been very superficial, but it is hoped that it has drawn attention to the excellent opportunities that the tribes in this country afford for a complete and thorough physiological and genetical investigation of a question which is of great biological and economical importance. It is also hoped that the realisation of the genetical aspect of this problem will stimulate investigations into the other side of the question—that is, into the reasons why many natives races do *not* tend to die out when they meet the changes in environment consequent upon contact with European civilization. In no place could these two aspects be studied simultaneously to better advantage than in North Borneo where we have tribes almost side by side, some showing increases and others decreases in population.

Summary.

While on scientific expeditions in Borneo in 1931 and in 1932 for the purpose of collecting blood grouping and other genetical and anthropological data, family histories were taken concerning some 3,000 natives. These natives were drawn from districts some of which, according to the Census, show an increase, and others, a decrease in population during the last ten years. The family data collected on these expeditions are used as a basis for discussing the question of depopulation. The discussion is begun with the assumption that depopulation may be the result of a number of different causes, some being of primary, others of secondary importance. The former may be identified by the fact that they are the most common, and are found acting almost universally in complete independence of conditions peculiar to any one tribe or place. The causes to which depopulation in the Pacific is usually attributed, are taken one by one, and each is discussed in the light of its importance in North Borneo. The causes found to be common both to the Pacific

Islands and to Borneo are considered to be the most likely causes of depopulation in general. They are disease, malnutrition and inbreeding, and the suggestion is made that the question is mainly a genetical one. In conclusion the appropriate remedy is briefly discussed, and a plea is made for the thorough investigation not only of tribes showing depopulation, but of neighbouring tribes which, under almost similar conditions, show increases of population.

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Clinical Notes

REPORT OF A CASE OF HYPERPLASIA WITH HYPERFUNCTION OF THE BREAST.

by

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This patient T— S— (record No. 430/22, filing section: Breast— Hyperplasia with Hyperfunction) was admitted on the 19th October, 1922. She was a young woman, 23 years of age, who was admitted for enlargement of the breasts, especially affecting the left one. She had been married for three years, having one child, a daughter, aged 2. She had always been healthy. It is not stated whether she suckled her baby or not. There was a history of a small boil on the left breast, but unfortunately it is not said in the report when she had had it.

Three days after giving birth to the daughter, 2 years previously, the enlargement of the left breast had begun. At first this enlargement was accompanied by pain, but the pain later disappeared. The breast still continued to enlarge slowly.

On admission, the left breast was enlarged almost to the size of a football. The diameter was 7". The weight caused it to hang down on a long pedicle 8" long by 5" bread by ¾" thick. The mammary gland was spherical in shape and was moderately hard on palpation. Its medial side was more or less circular, but the lateral side was lumpy and irregular in out-line. This was not painful nor tender. The appearance of the patient is shown in the photograph. (Photo I). When she sat down, the left breast rested on her lap.

The patient's urine contained quantities of sugar and this was proved to be lactose.

On the 25th October, local anæsthesia was induced with Barker's solution (0.2% B.T. eucaine), and the pedicle of the breast divided. The vessels were clamped and tied. On cutting the breast across, after removal, quantities of thick creamy milk exuded. The wound was sutured, and the patient was discharged on the 4th November.

It was noted before the patient left hospital that the right breast which had been enlarged and secreting milk was considerably smaller, but was still secreting a little milk.

Figure No. 2 shows the appearance of the patient after the removal of the left breast. The right breast is now definitely smaller.

The two photographs of this article were come across when cataloging old clinical photographs in the new School of Surgery, and reference was made for particulars to the report which had been carefully drawn up by Dr. S. K. Lam who was then acting as surgical ward clerk.

Although no microscopic section was taken, yet the unusual character and the enormous degree of the enlargement, perhaps make the case worthy of record.

K. H. D.

Review of Books

VITAL CARDIOLOGY: By BRUCE WILLIAMSON M.D. (Edin.) M.R.C.P. (London) (E. & S. Livingstone, Edinburgh 15/- net)

No senior student or general practitioner will fail to derive help and encouragement in his every day work from a study of "Vital Cardiology" in which Dr. Bruce Williamson has given us what he claims with some justification to be a "new outlook on the prevention of heart failure."

Dr. Williamson has a vivid style and an infectious enthusiasm for his subject and has achieved a book of absorbing interest and real originality. Cardiology in his hands takes on a new simplicity and significance. Elaborate laboratory technique has no place here. That the family physician, with his trained Senses of sight, touch and hearing, possesses the best of all facilities for the examination of the functional efficiency of the heart is the belief of the author, who makes no secret of his debt to the late Sir James MacKenzie. And in 337 pages of good clear type he shows us how to do it. He speaks of "the danger of relegating cardiology to the status of a speciality, which Heaven forbid!"

As examples of his vivid style we may cite the following:—"For a time let the reader forsake the time-honoured pursuit of murmurs. The heart is something more than a series of valves which broadcast a tune". And again—"I think it may be said without libel that at the present time we, as a profession, quite inwittingly, pay greater attention to the early loss of compression in our motor cars than we do to a similar state in the hearts under our care".

The physiological principles upon which this study of heart function is based are clearly presented in Part 1—a matter of 45 extremely readable pages. Rate and Force are the two essentials repeatedly emphasised.

The great importance of tachycardia is stressed, and it is pointed out that increase in rate is always obtained at the expense of diastole and therefore at the expense of the nutrition of the heart muscle. A new and simple clinical test is offered for the solution of the problem which so

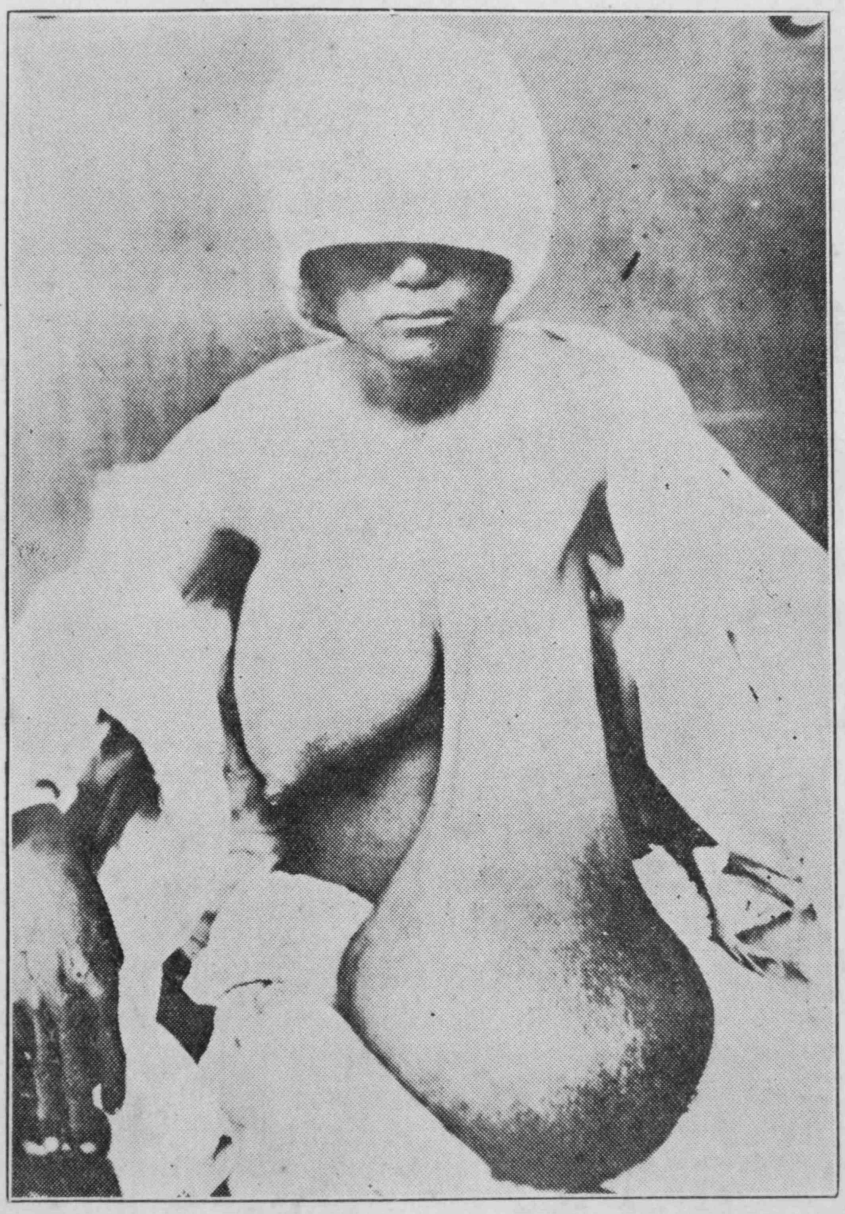

Fig. 1. Appearance of Patient Before Operation.

Fig. 2. Appearance of Patient After Operation.

frequently assails us, namely the distinction between tachycardia of physiological and that of pathological origin.

In the section on treatment, the uselessness of Digitalis in Pneumonia is affirmed and explained. The question of prolonged rest as a precautionary measure after rheumatic infections is dealt with in unorthodox fashion, and it is submitted that the greater incidence of mitral stenosis in females is actually due to the greater success in enforcing rest in the case of the gentler sex. Stasis, we are reminded, is inseparable from fibrosis, and the fact that "boys will be boys" may in many cases be a felicitous one. Very definite rules are laid down for ascertaining whether or not active infection has subsided, and therefore whether or not prolongation of rest is likely to be beneficial or actually harmful.

On the whole, perhaps less credit is given than is due, to the author's teachers of the Edinburgh School. The post-war teaching in Edinburgh was scarcely so murmur-ridden as he would have us believe.

There is a good deal of repetition, but never ad nauseam. It is obviously for the purpose of driving home essentials, and not for padding. The book is well-printed, attractively got up, and can be heartily recommended as an enjoyable and useful work, particularly to those of us who have to get along without the aid of heart specialists.

J. D.

"SCHISTOSOMIASIS" by RAMESES GIRGAS. p. 529, illust. 25 s. John Bale, Sons and Danielson, Ltd. London.

The author of this monograph is a physician practicising in Tanta, a town in Lower Egypt, where Bilharzia is extremely prevalent, he accordingly writes with considerable experience of the clinical aspects of this infection. The book deals exclusively with the three schistosome diseases caused by S. haematobium, S. mansoni and S. japonicum, respectively. Of the last named the author disclaims any first-hand knowledge, but nevertheless he gives an adequate description of the various aspects of the infection. The book contains chapters on the history, parasitology and epidemiology of the diseases, there is also a chapter on laboratory technique. The three diseases are dealt with in further detail from the pathological and clinical points of view. The author produces considerable evidence to support the contention that Egyptian splenomegaly is a hepato-lienal fibrosis secondary to uninsexual infections with male Schistosoma mansoni.

The book as a whole is well written, although a few departure from conventional syntax are noted. The illustrations are numerous and excellent in quality. There are frequent references in the text to original papers, but with the exception of short lists of references after two chapters, there is unfortunately no bibliography. This is greatly to be

regretted, and it is hoped that the omission will be made good in future editions, thereby augmenting the value of the book to the investigator.

The book should be read by anyone interested in schistosomiasis, and should certainly be acquired by all having much to do with these infections. Workers in the Far East, while primarily concerned only with S. japonicum, cannot fail to derive much useful information from the perusal of the book as a whole. For the three schistosome parasites of man have much in common.

L. J. D.

GREENS MANUAL OF PATHOLOGY. Revised and enlarged by H. W. C. VINES, M.A., M.D. Fifteenth edition. London: Balliere, Tindall and Cox. 1934. (Pp. xii—928; 425 figures, 8 coloured plates. 25s.)

The present edition of this well known textbook has been drastically revised and enlarged by Dr. H. W. C. Vines. This volume is more than a third larger than its predecessor.

The subject matter is divided into sections dealing with general and special pathology. The whole is dealt with clearly and concisely and represents a sound exposition of present day teaching. The illustrations are numerous and of excellent quality.

The book can be cordially recommended to students about to commence their pathological studies.

L. J. D.

Acknowledgements

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