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THE USE OF DIATHERMY IN MEDICAL AND SURGICAL PRACTICE*

BY

C. H. WAN, M.B., Ch.B., F.R.C.S. (Edin.)

Mr. Chairman Ladies and Gentlemen,

I thank you for inviting me to read a paper before your learned Society. I have chosen as my subject "The Use of Diathermy in Medical and Surgical Practice." This method of treatment is now used on a large scale and furnishes a valuable and promising therapeutic agent both in Medicine and in Surgery. As the subject covers such a wide field, I do not claim to deal with it in an exhaustive manner in my paper but will only endeavour to describe some of those conditions for which Diathermy has been found to be beneficial. Like any other form of treatment, the secret of success in any particular case is perseverance. Cases are often very discouraging and one is inclined to give up treatment, thinking that no good is being done; but with patience, even in the most discouraging cases, some improvement may be obtained at the end.

Definition.

Diathermy is a form of thermo-therapy which utilises electrical energy for the production of thermal effects in the depths of tissues, It is a well-known fact that electrical currents heat the conductors through which they pass, but it is impossible to raise the internal temperature of the body by the ordinary continuous current, on account of the pain produced by strong applications.

A paper read before the Hongkong University Medical Society March 5th, 1923.

In order to raise the internal temperature, then, we must employ currents which reverse their directions many thousands of times per second. These are known as high-frequency currents and, in Diathermy, we employ their heating effects produced by their passage through the body tissues.

Physiological effects of High-frequency currents.

We all know the therapeutic value of heat and are familiar with the hot poultices and fomentations. Diathermy enables us to apply an "internal poultice," and the heating effect takes place right through the tissues, so that the deep lying structures are heated. After a high-frequency current has been passing through a patient for 10 or 15 minutes, he begins to feel warm all over the body and his pulse rate rises. Sometimes there is a fall of blood-pressure, but the effect both on the pulse rate and on the blood-pressure depends on various factors, viz:—The previous condition of the blood pressure, the condition of the heart, blood vessels and kidneys.

The tendency for the blood pressure to fall is due to the peripheral vaso-dilator action of the high-frequency currents. In healthy subjects, the heart's action becomes more vigorous and checks this fall; but in subjects with a feeble heart or in those suffering from Arterio-sclerosis, a pronounced fall of blood pressure may be produced on account of the inability of the heart to compensate for the peripheral dilatation.

The passage of the currents causes a general rise of temperature. This artificial general pyrexia differs from ordinary pyrexia in that it is not produced by toxins circulating in the blood. After the current has been turned off, the heat-regulating mechanism quickly eliminates the excess of heat and the temperature returns to the normal. During the passage of the current, the sweat glands become active and perspiration breaks out. In the parts under the electrodes, there is set up an active circulation which carries away the heat and distributes the heated blood all over the body. If it were not for this active circulation, the parts under the electrodes would become dangerously overheated, and charring of the tissues may result.

In certain inflammatory and ischaemic conditions, diathermy currents promote tissue drainage, relieve the congestion, and give marked relief from pain. This is brought about by the oscillations set up by the currents and the flushing of the inflamed parts by the actively circulating heated blood, which causes absorption of the inflammatory products, promotes oxidation, and stimulates metabolism.

In elderly people and in conditions of marasmus and inanition, application of diathermy is followed by improvement in appetite and in general health. Digestion improves and weight increases. The treatment has a soothing effect on the nervous system and promotes sleep. On the whole a general feeling of well-being is experienced by the patient.

Diathermy has marked analgesic properties in painful affections and a stimulating effect on cells and glands of the body.

Methods of Application.

(*a*)—Diathermy Condenser Couch.

This method may be used when it is desired to place the whole body under the influence of high-frequency currents. Placed on the couch are insulating cushions, underneath the couch is fixed a large metal plate. The patient is fully dressed on the insulating cushions. One terminal of the diathermy machine is connected to the large metal plate, the other terminal being either fixed to a handle on the couch which the patient grasps or attached to an electrode which may be applied to any desired part of the body. The metal plate and the body of the patient form the armatures of a condenser system, the intervening insulating cushion acting as the di-electric. The patient is alternately charged and discharged and the whole body is brought under the influence of the currents.

In another form of couch, the large metal plate is divided into a series of small plates and a thin sheet of ebonite is used as an insulating material. By means of an arrangement at the head of the couch, any of the plates may be connected to the high-frequency terminals, and the current can either be given to the whole body or concentrated under special parts.

During treatment the patient must be watched, as in some cases a fall of blood pressure occurs and faintness is produced. It is also advisable that any metallic substances worn by the patient be removed, such as keys, coins, hat-pins, etc.

(*b*) *Local Treatment.*

This treatment is carried out by means of electrodes which may be in the form of plate electrodes or glass vacuum electrodes.

The plate electrodes are sheets of pliable metal cut to various sizes and shape and are moulded and shaped to the part to be treated. Intervening between the electrode and the skin is a piece of cloth or surgical lint moistened with a 5 per cent. solution of saline. This cloth is folded in several thicknesses, usually eight, and should be slightly larger in area than the metal plate electrodes. When the pads and plates have been placed in position, they must be securely fixed by means of bandages or straps. The metal plates are next securely connected by means of well-insulated cables to the terminals of the machine It is very important that the electrodes should be properly placed on the part to be treated and care must be taken to avoid wrinkles in the pad as these may cause overheating at one spot. In regulating the current it is advisable to commence the sitting at zero and gradually increase it until the patient feels a sensation of warmth. The current regulator is now left in the position reached. After a time, if necessary, the strength of the current may be increased and

the patient is instructed to say at once if any discomfort or overheating is felt, when the switch must be immediately turned off. In medical diathermic applications, we must always be guided by the sensations of the patient. A sitting usually lasts 15 to 30 minutes and may be given daily or every other day.

I have already mentioned that it is very important to place the electrodes properly in position in order to obtain the maximum effect of the diathermic current, and I will now take the knee-joint as an illustration. As diathermy currents take the shortest path between any given pair of electrodes, it is useless to apply one electrode to the anterior surface of the knee and another to the anterior surface of the thigh, for, by this means only the anterior surface of the joint will be heated. It is equally useless to apply large pads, one in front and one behind the joint for most of the heating effect will probably take place in the tissues on each side of the articulation between the lateral edges of the pads, and the centre of the joint does not receive sufficient heating. We must therefore arrange the size and position of the pads so that the skin areas covered by the electrodes are exactly opposite one another and the skin areas separating the pads must be at least as wide as the areas covered by the electrodes. After thoroughly warming up the joint in this way, we turn off the current and place the electrodes on each side of the knee; the current will now pass through from side to side and the joint is then uniformly heated.

By means of a transformer connected to the diathermy machine, the voltage of the high frequency currents may be raised to a potential sufficient to give strong brush discharges to operate glass vacuum condenser electrodes. These electrodes are also known as condenser electrodes because the current flowing to the inner surface of the tube along the wire produces, through electrostatic induction a corresponding charge on the outer surface of the glass. These electrodes are made in various sizes and shapes and when applied to the skin they give off a violet brush discharge and numerous small crackling sparks, and the air within the tube glows with a violet light. In giving the treatment the glass electrodes should be first placed on the skin and the current is then gradually turned on. Loud crackling sparks from the glass to the skin are now observed and a prickly sensation is felt by the patient. The electrode is kept in contact with the skin and is moved about over the area requiring treatment. The skin soon becomes red and the prickly sensation is replaced by warmth. This form of high frequency application acts by stimulation of the skin and the production of erythema and tends to relieve pain and promote superficial tissue drainage. The stimulation so produced is of value in certain forms of skin diseases such as Alopecia areata, Chronic eczema, acne, and lupus. Ozaena and other septic conditions of the nose, mouth, vagina or rectum may be benefited by the condenser electrodes because the ozone and oxides of nitrogen produced from the decomposition of the atmosphere may have a germicidal action.

I will now deal with the practical application of Diathermy in Medical and Surgi al diseases. Before I will do so, I wish to point out the difference in the application of diathermy between medical and surgical practice. For medical purposes we endeavour to raise the temperature of the tissues within physiological limits. For surgical purposes, on the other hand, we concentrate the diathermy current on a small area and increase its strength until destruction of tissues takes place.

For medical purposes, when diathermy is used as a local application, some rules have to be observed:—

1. The size of the electrodes and the position in which they are placed must be carefully considered.

2. The saline pads must be thoroughly and evenly moistened and no wrinkles or folds allowed. The edges of the metallic electrodes must not overlap the pads or touch the skin.

3 Begin treatment with the current regulator zero.

4. Gradually increase the strength of the current until a sensation of warmth is felt.

5. Be guided by the feelings of the patient and when he complains of overheating, turn off the current immediately.

6. When anaesthesia of skin is present, do not give diathermy unless absolutely necessary. In trophic conditions of the skin, great care must be taken.

There are certain conditions in which Diathermy is contraindicated, viz:—

1. Inflammatory conditions associated with walled-in pus.

2. Venous Thrombosis.

3. Advanced arterio-sclerosis.

4. In acute haemorrhagic conditions, *e.g.*, pulmonary haemorrhage, gastric ulcer, etc.

5. High-frequency currents of great amperage should not be given soon after a meal.

Diseases of the Circulatory Sytem.

Diathermy currents have a profound effect upon the circulation: the effect produced depending upon the particular method of application, *i.e.*, whether general or local diathermy is applied and whether weak or strong currents are used. Before treating any serious disturbance of the circulatory system, a careful diagnosis of the cause of the trouble must first be made. In subjects with normal blood pressure, diathermy does not cause a fall of blood pressure, it may cause a temporary rise on account of the increased action of the heart.

But in a patient with a low blood pressure and a feeble heart, fainting may occur. The conditions of the kidneys must be ascertained as these may be the cause of hypertension, in which case general-diathermy applications are not likely to be of any practical use.

We will now consider some of the circulatory diseases in which diathermy has been found to be beneficial.

Angina Pectoris. In this condition there is a general arterial spasm which can be relieved by diathermy. A large indifferent electrode is placed over the dorsal spine and a smaller electrode on the front of the chest over the base of the heart and the cardiac area. A current of 1000 M.A. is used for five minutes. Soon after the application, the arterial spasm ceases, pain disappears and with it the sensation of impending death.

Intermittent Claudication. This condition, as you all know, appears to be due to a defective blood supply to the muscles of the leg, and in some cases, is associated with calcarious arteries or phlebitis. Severe, cramp-like pains are complained of in one or both legs on walking a certain distance. The pain compels the patient to stop, and ceases after rest but returns on resuming the walk. Applications of diathermy are a successful means of treating this disease and the treatment may be supplemented by galvanic or sinusoidal currents.

Circulatory disturbances of the brain. Good results follow the use of diathermy in cases of severe headache accompanying hemiplegia and hemianopsia, with trophic changes in the eye and loss of hearing, and also in cerebral syphilis accompanied by headache and noises in the ears. One electrode is placed on the upper cervical region, and another over the mid-dorsal spine. The current used is 5 to 7 amp. and the duration of the sitting lasts from 5 to 7 minutes. In cerebral cases, the treatment must not be prolonged on account of the marked changes produced on the cerebral circulation. Anaemia of the brain, a low blood pressure and excitement are contra-indications.

Chilblains. The cause of this trouble is obscure and mild cases can be treated with the plate electrodes. Thick pads well saturated in saline solution are placed one on the dorsum and the other on the palm of the affected hand. The current is carefully raised to the desired degree, the patient's sensation being the guide. About 5 to 7 amp. is sufficient and the duration of each sitting five minutes. In severe cases, diathermy should be supplimented by rhythmically sinusoidal currents. Another valuable method of treatment is with the condenser electrodes.

Raynaud's Disease can be treated on the same lines as chilblains.

Sluggish and feeble circulation of the old. In this condition, diathermy supplies the heat in which the feeble body of the aged

is deficient. Patients feel warm and comfortable after the treatment: digestion is aided and sleep promoted. A small current .2 to .4 amp. is used and a sitting of 15 minutes' duration is sufficient.

Internal Haemorrhoids. Haemorrhoids which do not prolapse, but which give rise to haemorrhage pain and irritation, are suitable cases for diathermy. After treatment rectal pain is relieved, haemorrhage, may cease, and the haemorrhoids become less troublesome. The technique is as follows: the patient lies on one side with the knees well drawn up and the buttocks near the edge of the couch. A large well moistened indifferent electrode is placed on the abdomen. The rectal electrode which is of metal is introduced into the rectum after it has been warmed and oiled. The current is then turned on, beginning at zero and gradually increased until 1.5 to .2 amp. are registered on the Ammeter. The treatment occupies 5 to 10 minutes and may be given every other day. At the termination of the sitting, the current is turned off and the rectal electrode is left in position for a few seconds in order to allow it to cool before extraction in order to avoid the unpleasant sensation when the heated electrode comes in contact with the sensitive parts around the anus.

Inflamed and Congested Prostate may be treated on the same lines as the Internal haemorrhoids.

Diseases of the Nervous System.

Sciatica. Before treating a case of Sciatica by any form of electrical method, we must make sure of the diagnosis first, otherwise failure would inevitably follow. Many cases that are diagnosed as Sciatica are really cases of neuralgia, the pain may be due to pressure upon the nerve by a new growth, or a pregnant uterus, or be referred from a carious lumbar vertebra or referred from haemorrhoids, and fissures or affections of the prostate. Therefore a correct diagnosis must be made before treatment. Diathermy is of the greatest value in relieving the pain experienced in this condition.

Technique: A large well moistened saline pad is placed under the buttock; the other electrode over the inguinal canal and upper part of the thigh. The current is gradually turned on until a safe maximum is reached, usually 500 to 800 m.a. and each sitting lasts 15 to 20 minutes. It is frequently advisable to combine diathermy with ionization, using chlorine or Salicylic.

Lumbago. In this painful condition, the fasciae and fascial sheaths surrounding the lumbar muscles are involved in inflammatory changes and the application of local diathermy frequently acts like a charm; one treatment in some cases has an immediate effect in relieving the pain and stiffness. As regards the technique, the patient should be treated in a warm room, so that he can be protected from any chilling effects when the skin of the abdominal and lumbar regions is exposed. He lies on a couch and a well padded electrode, about 6 inches square and of a thickness corresponding to 12 or 16 layers of lint and well moistened with saline solution, is placed under

the painful area of the lumbar region. This is the active electrode. Another electrode of the same size is now placed on the abdomen and both are firmly secured in position by means of a many-tailed bandage. Having connected these electrodes to the terminals of the diathermy machine, the current is turned on, beginning at zero and slowly increased. In all medical diathermy application, it will be found that more current can be passed through a patient by increasing its strength slowly than by doing so rapidly. If the current is rapidly increased, the skin becomes quickly overheated and it has to be switched off before the temperature of the deeper structure is raised. If care is taken 2 to 3 amperes may be passed through the patient for 15 to 20 minutes before overheating is complained of. It is always an advantage to combine diathermy treatment with Chlorine or salicylic ionization. This combined treatment not only relieves the pain but also promotes the absorption of fibrous tissues formed in the fasciae of the lumbar muscles.

Osteo-arthritis. We know that many cases of so-called rheumatoid arthritis are due to the presence of some septic foci in the body and except securing temporary relief from pain and swelling it is useless to treat the local condition until the exciting cause is removed. Before treatment is given, an X-ray examination should be undertaken so as to ascertain the condition of the affected joint or joints. When extensive bony changes are found, electrical treatment can do little except relieving the symptoms temporarily. If no bony changes are found, then the case may be one of fibrositis or peri-neuritis round the joint. In this case both general and local treatment are called for. Diathermy, either alone or combined with Chlorine or Salicylic ionization is valuable in relieving pain and in promoting absorption of inflammatory products by inducing active hyperaemia. In no case can an arrest of the disease be expected until the exciting cause has been removed.

Diathermy in Surgical Practice.

In diathermy we possess a means by which we can remove or destroy pathological tissues without the aid of the knife. The lesions, which lend themselves to this form of treatment are:—Moles, Naevi, Urethral Papillomata, Urethral Caruncles, Xanthomata, Papillomata of the skin and mucous membranes chronic or malignant ulceration of the skin and mucous membranes, malignant growths, especially those of the mouth and naso-pharynx, various inoperable growths, Papillomata of the bladder, Rodent ulcers, etc. As I have previously mentioned, for surgical purposes, the diathermy current is concentrated on a small area by means of special electrodes and the current is increased until destruction of tissues takes place. Such a procedure ensures a more or less bloodless operation which can be performed easily and rapidly without fear of any subsequent surgical shock, and, if necessary the operation can be repeated. In inoperable malignant tumours with extensive infitration diathermy can secure a complete destruction of the growth and the dangers of metastases are much less than with a cutting operation, owing to

the sealing of the blood vessels and lymphatics draining the part. No doubt, the advantages are great, but as in all forms of treatment, there are also many disadvantages which are as follows:—

1. Healthy and diseased structures are equally destroyed.

2. Important vessels and nerves may be injured.

3. The danger of secondary haemorrhage is great when operating near large blood vessels.

4. There is a tendency to the formation of cheloid involving skin surfaces.

Technique of Surgical Diathermy.

A general anaesthetic is necessary in surgical cases, but in small operations, a local anaesthetic may be used. Two electrodes are used, one a large flat indifferent electrode made of pliable metal about 8 or 10 inches square, the other, an active electrode of various shapes to be described later on. Between the indifferent electrode and the skin is placed a thick pad of gauze tissue well saturated with a warm saline solution. To avoid severe burns, great care must be taken in applying this electrode: it should be evenly and firmly placed on the skin of the patient at all points and should be re-moistened if any part becomes dry. Care should also be taken that no bare metal or wire touches the patient.

The active electrode consists of an ebonite handle through which a metal core passes; secured to its proximal end is the cable of the diathermy, to its distal end various types of active electrode. These active electrodes may take the form of:—

1. Circular metal discs varying from ⅛ to 1 inch in diameter.

2. Circular or oval plates fitted with one or more short needles. The needles enable a deeper and more extensive coagulation to be produced, and also serve to anchor the electrode during its application.

3. Needle electrodes. These are used for destroying only small portions of tissue such as naevi or small papillomata.

4. Button electrodes. These are useful for application to the base or cavity left after removal of a malignant mass.

5. Blunt-knife electrodes for cutting purposes.

The preparation of the patient is the same as for a surgical operation and strict asepsis is essential. The surgeon grasps the ebonite handle and places the active electrode in contact with the tissue he wishes to destroy. The current is then switched on and its strength gradually increased from zero until the desired effect is produced. In actual practice, the amount of current used may be from ½ an ampere to 2 or more amperes but the operator should

judge the amount of current necessary in any particular case by the effects it produces and not by the amount registered on the ammeter. As soon as crackling sparks begin to appear on the edges of the electrode, the current should be switched off, and the operation stopped. On examining the tissues under the electrode, they will be found to be hot, dry and white in appearance, in fact they have been coagulated. Be careful not to scrape away the surface of the coagulated tissues on account of the liability to haemorrhage. In cases where the operation field lies in the vicinity of a large blood-vessel, it is necessary to perform a preliminary ligation of the vessel a few days before the actual operation is undertaken in order to prevent secondary haemorrhage.

We will now deal with some of the conditions to which Surgical Diathermy is applicable.

Superficial cutaneous blemishes. Such lesions as moles, flat warts, acne, freckles, xanthomata, caruncle and urethral papillomata are best treated by diathermic fulguration.

Technique: The patient lies on a condenser couch. One terminal of the machine is connected to the metal plate under the couch, and the other to the handle of the couch, which is grasped by the patient. The operator holds in his hand a fine needle electrode provided with an ebonite handle. When everything is ready, the current is turned on and gradually increased to ¼ or ½ ampere, and the point of the needle electrode gradually brought to within about 1/16 inch of the part to be destroyed. Sparking then occurs and in a few seconds the necessary destruction has taken place. I have found this method of treatment for superficial cutaneous blemishes very efficacious and little or no scarring results. No dressing is required, as the part so treated becomes dry and crumbles away in a few days.

Papillomata of the skin and mucous membranes. These may be treated either by the diathermic fulguration, as just described or by the needle electrode. Of the two methods I prefer the latter because it gives better results.

Technique: A local anæsthetic is injected around the base of the tumour. A large indifferent electrode is placed in a convenient position and the active needle electrode is made to transfix the base of the growth. The current is turned on until the tumour is coagulated.

Naevi. Small naevi in unexposed positions are best treated by excision with the knife. Large naevi of the skin and mucons membranes can be successfully removed by diathermy.

Technique: A needle for subcutaneous injection is passed through the skin into the naevus, one at each side. A wire, insulated by enamel is passed along each needle to its tip, and the current is passed between the ends of the insulated wires. By this method

the skin is protected from the current at the point of entry of the electrode. The current is increased cautiously and the finger is placed on the skin over the naevus. If the skin is felt to become very hot, the current must be cut off.

Papillomata of the bladder. There are two methods of treating this condition by Diathermy, viz:—(1) The open supra-pubic method (2) The per-urethral method.

The supra-pubic method:—

1. Patient is prepared as for a surgical operation.

2. A general anæsthetic is administered.

3. The bladder is irrigated with warm boracic lotion. After irrigation leave 8oz. of the loton in the bladder.

4. Introduce a cystoscope and ascertain the site of the tumour.

5. Place the patient in the Trendelenberg position and perform a supra-pubic cystotomy.

6. Expose the tumour.

7. Pack off the intact mucous membrane of the bladder with wet gauze swabs leaving only the tumour and its immediate surroundings exposed.

8. If the tumour is pedunculated, seize the pedicle with a pair of ring forceps and put it on the stretch. With the curved diathermic knife, burn off the pedicle quite close to the bladder wall.

9. If the tumour is sessile, apply the forceps to the mucous membrane of the bladder wall at and around the tumour base. If it is found impossible to apply the holding forceps to the base of the tumour well below its main mass, the mucosa must be incised well beyond the base with the diathermic knife. Pick this up in forceps at one point and dissect away the area thus marked out.

10. The area left after the removal of the tumour may be further treated with the button electrode in order to destroy any cells that may be embedded in the deeper layers of the bladder wall. This precaution should always be observed on account of the tendency of these papillomata to take on malignant characters—in fact some authorities regard them from the first as papillary carcinomata.

11. After getting rid of the main mass, a search must be made for the small villous growths which can be destroyed in situ by the small ball electrode.

12. Remove the gauze swabs from the bladder cavity. As a rule there is no bleeding from the base of the tumours, but should there be any oozing, it is readily checked by a touch of the electrode.

13. Suture the bladder with interrupted catgut sutures, leaving a space large enough to admit a drainage tube. The parietal wound is sutured in the usual way.

14. In aseptic cases the bladder is not washed, the drainage tube being removed on the 3rd day. If cystitis is present, daily irrigation of the bladder must be practised.

The Per-urethral method.

1. Apply Novocain to the urethra to render it anæsthetic.

2. Irrigate the bladder and then fill it with 8oz. of Boracic lotion.

3. Introduce a catheterising cystoscope into the bladder and examine the growth.

4. Place on the thigh of the patient a broad indifferent electrode.

5. The active electrode, consisting of a fine core surrounded by insulated material except at its distal end is passed down the cystoscope and manipulated until its free end comes in contact with the base of the growth When in position, the current is switched on and increased until the tissue whitens from coagulation. Other papillomata, if present are treated in the same way. The bladder must be irrigated again as soon as its contents become cloudy. If the papilloma is bent so to overlie its base, the upper portions must be destroyed piece by piece till the base comes into view, which can then be coagulated. Carcinoma of the Cervix. When the case is seen early, the best treatment is undoubtedly a radical operation, but in inoperable cases, diathermy, by destroying as much as possible the malignant mass, will render the condition of the patient a little more tolerable. It will rid the patient for a time of the foul discharge which is an annoyance both to the patient and her friends, check the haemorrhage that seems likely to be fatal and remove a a septic focus.

In malignant diseases of the Tonsils, diathermy offers many advantages over a cutting operation. First of all, the operation field is bloodless, because the bloodvessels are sealed as the operation proceeds. Absence of blood in the field of operation saves time and makes it easier to cut wide of the disease. Secondly any outlying malignant cells are destroyed and so there is a diminished liability to local recurrence. Thirdly the risks of sepsis and subsequent septic absorption are greatly diminished Micro-organisms are killed and lymph and blood vessels sealed Diathermic removal of a growth in such a septic field as the mouth leaves a much less absorbent surface than when the scalpel is used. On the other hand, the risk of secondary haemorrhage is great but this can be prevented by a preliminary ligation of the External Carotid artery. Of course the glands must be dissected in the ordinary manner at a subsequent operation.

Mr. Chairman. I have endeavoured to deal with such a large subject in a lecture and in many respects my description must be inadequate, in which I ask your indulgence.

FIGHTING FRAMBOESIA IN MALAYA.

A paper read before the H.K.U. Medical Society on 21st March, 1923

by

Yeoh Hone Soo, M.B., B.S.

Last year I was appointed to the medical service of the Federated Malay States Government and was stationed at Kaula Lipis in the State of Pahang.

Pahang is the largest and least developed of the Federated Malay States. Its area is estimated at 14,300 square miles, with a coast line of 130 miles. It has one principal river, the Pahang River, which drains a large extent of the country; this river is unsuitable for navigation of any but small or native craft. At certain large tributaries, *e.g.*, the Tembeling, there are numerous rapids caused by large granite masses being strewn in the river. Except for the main railway trunk connecting Kaula Lipis with Kaula Lumpur, the means of communication are limited to these water-ways and poor jungle tracks, often made and used by wild animals.

The state is subdivided into Districts, named Khipus, Raub, Benta, Temerlah, Kuantan, Pekan and Tembeling. Each of these districts possesses either a hospital or a large modern dispensary with a medical staff. In the large districts, where there are many European residents, there is usually a European medical officer attached

A census of the cases of Yaws was taken in each district; for this purpose special Malay dressers were detailed and marked for "Yaws Duty." They were assisted in this duty by the Penghulus or chiefs of the people. Where the places were accessible by rail or road they were sent out and ascertained the number of cases. In places less accessible, this census taking was done at the same time as the Travelling Dispensary Boat made its river trip.

Although the population is comparatively small, about 1,400,000, the work is rendered difficult by the fact that excepting for the aggregations in mining and seaport towns the population is widely and unevenly scattered.

Pathological manifestions encountered.

Various lesions are to be seen and the Malays have special names for them, thus "*Purn*" is a term to describe the stage of Yaws or Framboesia characterised by a papular eruption. These papules vary in size from 1 to 2 c.ms. flat or cupped shaped, are covered with a yellow cheesy encrustation. The exudation of a clear serous fluid is found with the encrustation; It is common to find as well a dirty accumulation of sand and mud firmly glued to the tumour. Such a stage is frequent in sucklings and young children, occasionally in adults. It may occur in any part of the body but most usually in the folds of the skin, the buttocks, the joints, interphalangeal spaces, and the angles of the mouth.

Another stage is known as "*bubol*"; this condition is in reality "Foot-Yaws" and is usually to be seen on the palms of the hands and the soles of the feet. It occurs mainly in adults and is manifested by a tumour bound down by the thickened epidermis; the epidermis frequently gives way and exposes an area of raw angry granulations surrounded by an area of split skin. The condition is extremely painful to the touch, but after a time as an encrustation forms, the pain tends to moderate.

In the conditions known as "*kedal*" the epidermis get excessively thick and tends to be shed away. When the lesion is found in the hands and feet and in certain parts of the body excessive itchiness is a prominent symptom. It is most commonly found in adults and since it occasions him little pain, little attention is paid to it. In cases of long standing the skin becomes depigmented and has a very white appearance.

A more distressing manifestation is known as "*restonj*" in which there is occasional bleeding and often a foul discharge from the nose, the patient's voice becomes affected, and in cases of long standing, the nose becomes depressed at the bridge, and even destruction of the anterior nares takes place. At other times there is a persistent discharging sinus from the face causing considerable disfigurement. This condition closely resembles "Ulcerative Rhinopharyngitis."

Finally, we have the stage known as "*segngel puru*" characterised particularly by affections of the bones and joints. The parts most frequently affected are the wrists, ankles and vertebral column. As sequelae to this stage it is common to see, in the country places, peculiar shapes in the limbs and sometimes an unsightly thickening of the skin of the body.

Aetiology.

It is generally accepted by most authorities that the Treponema Pertenue is the causal agent in the disease. The method of demonstration of the organism is to take some of the secretion from the Yaws lesions and examine it fresh under the dark ground illumination. One can readily observe the moving Treponema and I make it a practice to show them to the patient and explain to him that they are the cause of the disease; subsequent treatment is thereby rendered more easy.

The spread of the disease.

The greatest predisposing cause of the disease is filth. I have observed that, where the disease affects the majority of the members of a family, that family is living under filthy conditions. As a rule the houses are dirty, the people live huddled together, and bodily cleanliness is disregarded. The houses are very seldom cleaned and since there are no beds, the people sleep on the bamboo floors

with its layer of accumulated rubbish. They lie together, the infected with the non-infected, and so the likelihood of direct infection is very great. At the same time the floors are also the home of vermin of all kinds; some authorities hold that lice and bugs can infect by their bites.

Incidence of the disease.

In the 4,000 odd cases infected 50 per cent. were children of from six months to twelve years of age; they all suffered from either Purn or Bubol which forms are mostly contracted by direct infection. In one school I found that among the 66 boys examined, 44 were infected with Yaws and I observed that these boys lived quite close to one another in a large village or Kampong. In another Kampong, where the houses are closely aggregated together, 53.2 per cent. were infected.

Ignorance of the nature of the disease results in the free and intimate mingling of the infected with the non-infected.

TREATMENT.

Native treatment is carried out in various ways. When young children suffer badly from the effects of the disease, *i.e.*, when they begin to be restless with high temperatures and inability to sleep, the "Bomo" or Malay medicine man is called in. He recites certain prayers and incantations—"Jampi," as it is called; There is much noise on the drum and recitation through the night until the exhausted child gets to sleep. Should there be no constitutional symptoms the "Bomo" is not sent for.

To the lesions of puru and bubol they apply local applications of a juice called "Gerta Jetar," which is obtained from the young shoots of a tree by the same name which grows to a height of 60 feet or more. This tree is peculiar in that it does not branch except at the summit and it usually grows in the heart of the jungle. I have seen the tree but twice, and have been unable to obtain its botanical name.

The juice is obtained by tapping the young shoots; it is of a thick milky white consistency. The price is fixed by the demand and as a rule ranges from 70c. to $2 per half pint. It is prepared for application by mixing it with the ash derived from burning the leaves of the Jack fruit tree, the whole is then mixed to form a fluid paste. It is now applied to the puru tumour or bubol as the case may be. This is done daily until the disease is cured which is a matter of six months to one year. I am of the opinion that the juice merely contains a high percentage of tannic acid which, applied, coagulates the secretion and forms a crust which, for the time, blunts the nerve endings and so gives relief. When bubol occurs in the soles of

the feet the patient finds it difficult to move about and carry on his occupation; he usually bandages the feet with the bark of trees lined by soft fibre.

Kedal, Restonj, and Segngal Puru are treated by recitations and incantations by the Bomo and dietetic regulations, which include abstinence from eggs, prawns, and beef obtained from the white buffalo or bull. There is no drug treatment.

The scientific treatment of the condition.

The most effective method of treatment appears to be found in the use of injections of arsenical preparations, especially of salvarsan, neo-salvarsan, neokharsivan, and novarsenobillon. In starting out on our crusade we decided to give to each affected person at least four injections at bi-weekly or tri-weekly intervals. The treatment is started with small doses—adult males .45 grammes of neosalvasan, adult females a little less, and children, according to age up to .2 grammes. In my own cases treated at the hospital, I have observed that patients show various degrees of tolerance to the drug and that children stand fairly large doses. With bubol (pun and segngal pun) the patients usually return within a week reporting themselves cured but in the cases suffering from kedal and restonj usually more than two injections are necessary before any marked improvement is seen.

There is no necessity for the application of drugs to the lesions as they usually clear up within a week. The good news and the better method of treatment soon spreads, but not with the rapidity that one would desire; for the means of communication are scanty, and the poor Kampong or village people find it difficult to reach the hospital and worse still, many are incredulous of the results to be obtained. In the large towns, however, the number desiring treatment by injections increase daily; the illiterate people however still remain a difficulty particularly so as the disease is very rife amongst them.

In places, where access to the village people was easy by road, the chief of the people was told to assemble these suffering with pun on a day convenient to the majority of those afflicted. Thence I proceeded with a Malay dresser and attendant by motor or rail.

Preparation of the injections.

It is most essential to go over beforehand all the material that you will require, for nothing is obtainable in the villages. I use for sterilisation a kerosine tin can heated by a kerosine oil stove; it is essential to take plenty of distilled water, spirit, and Tr. Iodi. Take plenty of pieces of towel and bring along a handy enamel basin. Never forget a spare syringe and needle and filter paper and cotton wool. The injection is carried out intravenously in the forearm either at the wrist or elbow.

Difficulties in giving the injection. The patient is not lying upon any specially arranged bed or chair but is given the injection in the erect posture either seated or standing up. Usually the dresser does the tying up of the arm and making the vein stand out while the attendant helps with the necessaries. Meanwhile I break open a .9 grm. neosalvarsan tube and dissolve it in 10 c. of distilled water. This is ready for two male adults. And the "Bloodless Method" is the best—that is, the needle is not removed from the syringe so that the blood flows into the barrel of the syringe and is driven back when the drug is injected. This is not as easy as it looks, because in this posture the patient will not keep his arm still but will roll it or move about as he pleases amidst the frequent jabberings and joking remarks of his onlooking comrades. It is almost a fatiguing task exhorting him to be still, because no hard or harsh words are to be used, nor any high or rough handling which could be, at least, done in a hospital, because these people are ignorant and only semicivilised and at the least provocation will refuse the injection so that the great amount of patience has to be exercised and consequently each case takes an unnecessary long time.

And the injection must be intravenous, for should any of the arsenical preparation get into the cellular subcutaneous tissue and pain arises immediately, the injection at once becomes a terror and your once confident, admiring audience of "Purn" people at once gradually disappear the more timid and less civilised of them have already made far into the recess of the jungle never to come again to assay or even witness your injections.

Contemporarily with the time of my injection, another officer doing the same business in another district met with an unfortunate adventure. An injection was given to a middle aged lady who was suffering from kedal which was worrying her because it detracted from her beauty. It was without doubt that she died immediately after the injection was given her, although all methods of bringing her back to life were attempted by the unlucky officer, who became at once, an object of horror, a murderer in the eyes of these people. It was alleged that the death was due to an idiosyncrasy and shock and that the dose given was quite within reason, but whatsoever it may be, a great set back was at once started. All the people refused injections and the news of the fatality become more diffused that I was faced with a problem and thus adopted the following plan.

Win the confidence of the people. In this, it was essential that the language of the people must be understood and this fortunately I had at my command. Hence it was easy for me to mix up with the village people in their games, amusements and occupations and partake of their food so that they become used to me. Hitherto officers placed on such duties were arrogant, coarse and blunt with these people thinking them no better than the wild animals that inhabit the jungles they live in.

Explain the action of the drug to them. Popular pathology is given them. How the drug kills the germs when they become absorbed by the body—how the drug is most easy of absorption by injections into the vein. How it becomes excreted by the body—why it is necessary to have more than one injection and why after the lapse of at least a week or more it can only be repeated? How carefully the drug has been prepared. A tube is shown to them and explained with what nicety it has been done. I answer questions as they arise. My whole aim was to make as clear as I could the nature of the drug and its effect in the body.

Is the injection difficult? I explained to them how the people could make the injection difficult—how a minute's quietness will be all that is required of them. I told them the result of a sudden jerk of the arm causing the vein and skin to move against each other and displacing the needle and thus the drug manages to escape out of the real track and thus cause pain and unnecessary torture. I use myself a medium sized platinoiridium hypodermic needle which fits well to the syringe. A small needle does not startle the people and when sharp and smooth pierces the skin almost without any pain. Hitherto an ordinary sized intravenous needle has been used and this is like thrusting a bayonet into them and injection was much dreaded.

Get the news spread. When they feel that you are their friend and when the injection gives them no pain, when you do it quickly and deftly and when even you can manage to give the injection to a little baby without it making much ado, you will get the people to come for injections willingly and readily. Give the injections to the school boys first, and they tell the news to their parents and sisters and soon you have the whole village come up for an affair which previously was so much dreaded. Thus I was able to do in month's time at every trip I took about 1,000 cases, while in previous years other officers could only get about 200 in a year's time.

Difficulties of the campaign. On the part of the people there is the great distance to the centres of injections which could only be reached by traversing swampy and intricate jungle lands, and coming as they do with their whole families of little ones, the task indeed is a difficult one. It is an often event that they start at dawn from their places and arrive at our camp past noon and some not till quite dusk after accomplishing a distance of 12 miles or so. These people are usually busy the whole year with crops on which they depend for their livelihood. Difficult, slow and antiquated methods of farming are used, and consequently although they have been notified of an arrival, they were not able to bring their children affected with purn until they are less occupied. There is again the great incredulity and timidity of the people. The older folks go on gossiping that injection produces shortening of their lives and is a step that is made to extinguish their race. Our difficulties lie in mosquito attacks and blazing heat, the continual exercise of

patience and answering the irritating silly questions of the people, and the prolonged suspense of waiting and yawning for cases that came by ones and twos and 60s and 100s at all and irregular intervals. It is not in a Hospital where the patient is more or less under your control and can be directed. Here in the heart of a big jungle or on the bank the Pahang River, you are at the mercy of the people as any outburst of impatience drives the people away and you are left to your drowsy attendants and your drugs and the jungle.

Conclusions. I have observed that:—

1.—Injections of neosalvarsan and novarsenobillon and neokharsivan do produce good. In about a week's time all the purns on a child's body cleared up, that the child begins to pick up and gain weight to the great satisfaction of their parents. A boy with a tiny bubol on his foot will in four or five days' time run about, when not long ago went about limping and miserable.

2.—Give injections intravenously in all cases you can. If you have to give intramuscular injections to babies give quickly and diluted down, and get your assistant to rub over the part as soon as given, with instructions to the mother to apply a warm ash fomentation to part if child cries with pain at night.

3.—As cure is found, new cases will come up voluntarily for injections and don't reprove these for not coming earlier.

4.—It is bringing scientific treatment into the appreciation and the knowledge of a people that are dead to rational therapeutics and scientific treatment. Difficulties only arise when the way, method and mode in which any new treatment is introduced are harsh, coarse, arrogant and insulting to the people.

THE DISTRIBUTION OF THE BLOOD VESSELS.

By Joseph L. Shellshear.

The distribution of the blood vessels of the body is in a very remarkable way related to the function of the parts to which the vessels are supplied.

The time has gone by when certain subdivisions of medical science were allocated to anatomy, some to physiology, etc. The appreciation of such a problem as we are considering can only be seen in its fullest extent by calling in the aid of all the facts, anatomical, physiological, and pathological which bear on it. Any method of research which aims at containing itself within the limits of one branch can not be fruitful to the fullest extent.

If one looks on the vessels supplying a segment of the body in an early embryo, it is at once apparent that the blood vessels all fall under one of three categories, digestive, excretory, and muscular. The digestive vessels arise on the ventral aspect of the aorta and supply the gut; the vessels to the urinogenital apparatus are bilateral and supply the excretory and genital organs.

Included in the muscular arteries are the arteries to the developing musculature, and the nervous system which subserves the muscular function, and therefore both sensory and motor.

John Hilton has selected certain vessels, and shews a constant distribution for them. Of course it might be suggested that the selection of facts, no matter how important, does not warrant the formation of an hypothesis, on the other hand when a collection of facts point unmistakedly to a law, it is useful to accept it as an hypothesis until a further selection of facts disproves it.

John Hilton selected many vessels; of which I will deal with a few to indicate the importance of his finding.

The internal maxillary artery has many branches the numeration of which has taxed the student's memory and has given origin to mnemonics to aid him. Hilton in 1880 gives us the most useful way of remembering the branches for he names it the artery of mastication. Its branches are distributed to the organs of mastication; thus we look for branches to the bones supporting the teeth, the teeth, the muscles moving the jaw, etc.

We have the masseteric, temporal, pterygoid, and palatine branches supplying the muscles; the superior and inferior alveolar branches supplying the upper and lower jaws respectfully. The trigeminal nerve being the nerve of mastication, is supplied by it. John Hilton asks what of the middle meningeal and tympanic branches? The former supplies bone and not meninges and the area of bone supplied is that supporting the temporal muscle. The lower jaw of man does not compare with that of the fish for the temporomandibular articulation is one which came into being at the time when the ear was being evolved into a more perfect organ of hearing; this was done by making use of the primitive articulation of the lower jaw for auditory purposes and the formation of an entirely new articulation for mastication. The old articulation is the joint between the two ear ossicles, the malleus and incus. Thus arises a condition even more remarkable than a distribution following functional needs, for we have a distribution whch remains to tell of the evolutionary progress of the ear and one which allows us to confidentally make use of vessels for morphological purposes.

Turning from mastication to digestion we know that below the opening of the common bile duct absorption of digested food takes place, whereas above that point practically no absorption occurs, for it is in this region that secretion takes place to its fullest extent. The stomach, the pancreas, and the liver are pouring out their secretions and they all receive their blood supply from the coeliac

axis artery which Hilton names the artery of digestion, whereas below the opening of the common bile duct the whole of the absorptive portion of the alimentary canal is supplied by the superior mesenteric artery, clearly the artery of absorption. Below this lies the artery of excretion, the inferior mesenteric artery.

I know of no references to Hilton's work except his book on rest and pain which should be read by all medical students. We have passed through a scientific period during which a prodiguous amount of work has been done; in biology this work has been in the main of an highly technical character, whereas the observation of the human body—the study of human anatomy—has been supposedly determined by intensive study on tadpoles. The wonders of the embryo and particularly the living embryo have directed the attention of anatomists to the actual observation of growing and developing blood vessels and great advances have been thereby made.

But somehow the voices of John Hunter and John Hilton call to us and tell us that there is much yet to be learnt by studying the human body.

The microscopic and embryological study of the vessels has in many instances led to fruitless discussion as to which germ layer is concerned in their origin, when as yet the three layered condition of the embryo, so easily understood by a study of diagrams, becomes unsatisfying and unproved on an examination of the embryo itself. Furthermore it was recently fashionable to consider a problem finished when certain laws were put forward to explain the behaviour of the vessels in the embryo, *e.g.*, Thoma propounded a law explaining the distribution of the vessels in the embryo from purely mechanical laws of pressure. The relative value of a law seems to be governed not so much by the facts of the case as by the personality of the man who propounds them. Thus Hilton's selection of facts, when carefully analysed, fail to find an satisfactory explanation from any law so far propounded to explain blood vascular distribution. The professor in *Water Babies* throws the awkward evidence back into the water. Since an acceptance of Hilton's facts invalidates the present conceptions of blood vascular development, his work is cast back into the water and no mention of it is to be found in any modern textbook.

John Hunter likewise made many very arresting observations on the distribution of blood vessels; he pointed to many facts which help to explain such clinical conditions as cerebral haemorrhage; the angles at whch vessels come off the parent trunk, the conditions of end arterial supply, etc. But he made one statement diametrically opposed to Hilton's observations. "This general uniformity in course, connection and distribution of nerves, will lead us to suppose that there may be some other purpose to be answered than mere mechanical convenience."

"We observe no such uniformity in vessels carrying fluids, but find particular purposes answered by varying their origin and

distribution. . . . The course of the arteries is such as will convey the blood most conveniently, and therefore not necessarily uniform, it not being very material by what channel, provided the blood is carried to the part. This observation respecting arteries is likewise applicable to veins, and still more to the absorbent vessels, in which last regularity is even less essential than in veins."

"Whoever, therefore, discovers a new artery vein or lymphatic adds little to the stock of physiological knowledge."

There is no necessity to bring forward much evidence to shew that John Hunter failed to appreciate the significance of the supply of blood to a part. His two statements are contradictory and herein lies the secret of the constancy of blood vascular supply. The arteries receive their nerve supply from the sympathetic nervous system and it is the very fact that the nerves are constant in position in both ontogeny and phylogeny which governs the situation and distribution of the vessels. It was thought for a long time that the arteries of the brain were devoid of nerves but now it has been demonstrated that the branches of the sympathetic ramify on their coats. So that any line of investigation which deals with the vessels without regard to their nerve supply must of necessity be incomplete and fail to elucidate the problem of their constancy.

The material fact is that the whole of the blood can be drained into the abdominal vessels and a person can bleed to death into his own vessels. The whole economy of the body is directed towards supplying with blood those particular organs which are most in need of it; this supply in accordance with functional needs is borne out by the responses of all animals to such reactions as fear and anger. In states of fear the natural response in most animals is flight. To accomplish this end it is necessary to provide an immediate and adequate supply of blood to the brain and to the muscles concerned in flight. To this end the supply to the abdominal viscera is at once curtailed; only those who have a full appreciation of fear fully appreciate how heavy the food lies in the abdominal viscera; all the vegetative functions are in abeyance, the mouth becomes dry and parched, etc. The mental activities, however, become unusually alert; a place of safety is very rapidly found, the muscles are keyed up for immediate action. In other words the blood is switched off to those parts in immediate need. In a similar way it is desirable in the economy of the animal that immediately after the food enters the stomach that the amount of blood sent into the superior mesenteric artery should be curtailed. It is required to supply the necessary products for secretion, but once this preliminary act of digestion is completed the stream is directed to the artery of absorption, viz., the superior mesenteric artery.

Any organ which has a broad twofold function will generally be found to have two systems of blood vessels supplying it. The example which Hilton quotes is that of the palate which has the three fold function of respiration, deglutition, and mastication. One

therefore finds its supply derived from the ascending pharyngeal, the internal maxillary and the facial arteries. It would appear therefore that it is a matter of some moment which channel carries the blood for in all probability the process of distribution of the blood is more complex than appears from a superficial examination of the vesssels. We must look to a higher nervous control to understand the complete mechanism. Naturally since this control is phylogenetic in origin a study of the evolution of the various vessels becomes of the greatest importance.

I have referred to the phylogenetic constancy of the vessels of the brain in a previous paper in the British Journal of Anatomy. I there showed that the arteries supplying the claustrum are homologious with the hypopallial arteries in lower forms.

Stopford has written extensively on the blood vessels of the pons varolii and the medulla oblongata. He has indicated that the hypoglossal nucleus is supplied exclusively by the anterior spinal artery. In a study of the origin of the motor neuroblasts of the neural tube, Dr. Dart and I called attention to an artery which is found in very early stages in every embryo we have examined. This is the anterior spinal artery of the medullary tube; it is constant both in its time of origin and in its relations in all animals. It appears as a branch of the segmental vessels of the embryo which supply the muscles innervated by the anterior cornua of the spinal cord. This artery is depicted in practically every paper written on the neurogenesis of the spinal cord. Its function is definitely motor. Thus the muscles, when excited to activity, are provided with their necessary blood supply in such a way that the medullary centres innervating them shall also be supplied. Turning to the sensory side of the brain stem we find a similar functional distribution: The posterior spinal artery or its derivatives are supplied to the sensory centres: the trigeminal nucleus has a twofold blood supply and the distribution is more easily described from a functional basis than from an anatomical one; The posterior inferior cerebellar artery which supplies a great part of the cerebellar cortex also supplies the medullary portion of the trigeminal nucleus and when this vessel become diseased we find symptoms of sensory disturbance of certain components of function; thus it is found that there is loss to pain and temperature on the same side of the face. Tactile discrimination is not lost; a definite dissociation of function has been brought about.

Elliot Smith and other writers have associated a portion of the cerebellum known as the flocculus with the vestibular portion of the eighth nerve. Now although the vestibular nucleus is seldom affected by lesions of the posterior inferior cerebellar artery, despite its close proximity to the trigeminal nucleus, it is more than probable that if we could diagnose a localised lesion of the anterior inferior cerebellar artery we would find that the symptoms were due not only to the cutting off of the blood supply from the vestibular nucleus but to disturbances of the flocculus for they are both supplied by the same artery.

The meaning and evolution of the cerebellum is a very complex question, many writers, I think wrongly, have impressed upon us that it came into being in response to vestibular functions. It would appear reasonable on the first glance that an organ so intimately associated with co-ordination should have been more closely associated in its origin with the eighth nerve; but the fact must not be overlooked that vision and touch are of immense importance in many of the functions attributed to the eighth nerve. Garry shews that the insecta after being blinded behave in much the same way as the vertebrates after cerebellar injuries.

In the embryo the nerve which appears to be more closely associated with the cerebellum is the fifth nerve. It is seen in Petromyzon to enter the medulla oblongata immediately ventral to the bridge which forms the cerebellum. In the embryo the fifth nerve joins the hind brain in the neuromere named the cerebellar neuromere. All the tracts which enter the cerebellum appear to make use of the fifth nerve as the bridge for their entrance; thus we find the earliest tracts, the spino-cerebellar, enter one dorsal and one ventral to the fifth nerve. The great tracts connecting the cerebrum with the cerebellum constituting the pontine paths are found to surround the fifth nerve. This close association between the fifth nerve and the cerebellum is borne out by the cerebellar blood supply; the artery of supply to the trigeminal nucleus, the posterior inferior cerebellar, also supplies a great part of the cortex of the cerebellum, but more important this artery supplies the dentate nucleus, the great central efferent nucleus of the cerebellum. I think I have said enough to prove that there is nothing haphazard in the cerebral blood supply; I have dealt with the blood supply in a somewhat cursory manner in the B.J.A. and there I indicated how the blood supply of the corpus striatum and the optic thalamus give us indications of the same precision.

The present state of our knowledge of the pathology and symptomatology of the sympathetic nervous system does not permit us to do more than indicate that many of the more obscure symptoms classed under the head of functional neuroses may come under the head of lesions of the sympathetic of central or peripheral origin involving certain definite vascular areas. In conditions such as anterior poliomyelitis there certainly appears to be some definite lesion to the anterior spinal arterial area. Why a particular poison should select one particular area is unknown as also is why in lead poisoning certain groups of muscles are much more often involved than others. The facts of their blood supply may help towards the elucidation of some of these problems which are so often dismissed with such vague statements as "the tissues of the region have a peculiar susceptibility to this or that type of poison" such statements do not give any explanation at all. There can be no doubt that the first essential in dealing with the pathology of any condition is to have a correct knowledge of the principles underlying the anatomy and the pathology of the condition and such facts of blood vascular supply, as have been brought out by the work of Beever,

Hilton, Stopford and others, make it clear that the idea that anatomy belongs to surgery and physiology to medicine is entirely erroneous. These subjects allied with physico-chemistry form the indispensable basis of all medicine and are not be claimed by any particular branch of medicine.

SOME GEOLOGICAL EXCURSIONS AROUND HONGKONG

By Dr. C. M. Heanley, M.B., B.S., D.T.M., D.P.H.

The science of geology is being taught more and more in schools; it is of great importance to the engineer, prospector, political economist and sanitarian a smattering of knowledge of the subject gives an added interest to all travel, though this be only local walks around one's home. The geological study of South China will be one of the works which Young China will have to undertake to further the economic progress of the country. The neighbourhood of Hongkong is a good place for teaching many aspects of geology. The author hopes that this article will facilitate the work of others by indicating where some of the best sections are to be found.

Excursion 1. Take with you as much of the following equipment as you can procure though none of it is essential, hammer, pocket knife, pocket lens, compass, binocular or single telescope, a contour map of the Colony and this number of the Caduceus. Proceed to the new pumping station which is situated on the Pokfulum Road a little to the west of the University, walk in a westerly direction along the road. Immediately after leaving the pumping station the road passes through a cutting, take a good look at the sides of the cutting. The sides of the cutting are formed of decomposed rock with long sweeping curved or straight lines showing on it, these lines mark the joints of the original rock, here and there are boulders of undecomposed rock, some of them are almost globular, others subangular. The author has heard people ask how the boulders came there, were they left by the sea or thrown up by some volcanic eruption. A little study of the arrangement of the bouider in reference to the joint planes and of the half decomposed crusts of the boulders will soon convince the reader that the boulders are merely part of the rock that has not decomposed. The boulders have been formed in situ. Of what nature is the rock? Take a piece from the interior of one of the boulders which has been blasted open and examine it preferably with the pocket lens. It will be seen to be entirely made up of crystals, that is to say it is a holocrystaline, or in other words completely crystaline rock; these crystals are larger than is usual in most other rocks so that it is a coarse grained holocrystaline rock. It will be observed that the crystals are of three kinds, one kind is clear and glassy in appearance, it is crystaline silica or silicon dioxide, commonly called quartz, it forms little blebs of very regular shape. The second kind of crystal is black in colour; if the knife point be pressed against these they will be found to be quite soft and to split into innumerable thin flakes, these crystals are biotite mica, a silicate of potassium magnesium and

iron. The third kind of crystal is dull white or pale salmon pink or greenish white in colour, most of these crystals are orthoclase, that is potash felspar, a silicate of aluminium and potassium. A pale salmon pink colour is rather characteristic of orthoclase. If some of the dull white crystals are looked at carefully with a good pocket lens one will sometimes be found which shows on its surface a number of very closely set straight lines, this appearance is rather suggestive of albite though some other felspars show it; these lines are absent from the orthoclase crystals, they are due to repeated twinning of the crystals called polysynthetic twinning. We see then that the rock in the cutting is a coarse grained holocrystaline rock consisting of quartz, biotite and orthoclase with a little other felspar, such a rock is known as a normal granite.

We have mentioned that most of the surface of the cutting is made up of decomposed rock, what has happened to the rock to cause decomposition? If we look at the earthy material closely we shall see that it contains the quartz blebs unchanged in appearance, they have not decomposed. The biotite has altered, oxides of iron have been formed from it and diffusing through the decomposed material have stained it various shades of yellow and red, these being the usual colours of hydrated oxide of iron and peroxide of iron. The felspars will be found to have altered to a sofe white powdery material kaolin though this will mostly be stained yellow or red by the oxides of iron. The change in the felspars has come about in the following manner. Organic acids have been formed by the decomposition of vegetation on the surface of the ground and carbon dioxide, which acts as a weak acid, has been formed by the respiration of plants and decomposition of their shed leaves. These acids when dissolved in rain have sunk down along the joints of the rock and taken the alkalies from the felspar.

$$\underset{\text{Orthoclase.}}{Al_2O_3K_2O\,2\,(3\,SiO_2)} + 2\,H_2O + CO_2 = \underset{\text{Kaolin.}}{Al_2O_3\,2\,SiO_2\,2\,H_2O} + 4\,SiO_2 + K_2CO_3$$

leaving soft powdery kaolin, hydrated aluminium silicate, in place of hard crystals.

How do the normal granites occur in other places on the face of the Globe? They commonly occur as enormous masses called batholiths which have worked up from very great depths towards the surface and consolidated by crystalization some distance beneath the surface whilst under considerable pressure from overlying rocks. The chief characters of batholiths are, firstly their enormous size, some have been exposed by denudation till thousands of square miles are visible on the surface. Secondly their great depth: they go down so deep into the earth that no base of a batholith has ever been exposed by denudation or mining. Less characteristically but commonly batholiths have nearly vertical or steeply inclined side walls and bake the rocks in contact with them. Sometimes there is little baking of the surrounding rock but the upper surface and the side walls of the batholith show a varying thickness of finer grained

rock called a chilled margin the crystals being smaller than those in the interior of the batholith. Students of chemistry will remember that crystals formed rapidly as by quick cooling of a solution are smaller than ones of the same substance formed slowly. The chilled margin of batholiths varies from a few inches or less to hundreds of feet and the baked areolar may extend into the surrounding rocks for only a fraction of an inch to a distance of a mile or more. Baking causes a change in the constituents of the surrounding rock known as thermal metamorphism. The chilled margin of the normal granite can be noted in many places in Hongkong and is far more often seen than baking of the surrounding rock. The rocks above a batholith are called its roof. The top of a batholith is rarely flat but rises up in great elevations called cupolas. The parts of the roof between the cupolas are called roof pendants. If processes of denudation wear away the roof of a batholith the first parts of the batholith to appear on the surface of the ground will be the tops of the cupolas; as denudation increases the exposed portions of the cupolas will get larger and larger till at length the tips of the roof pendants disappear and the batholith is all that is left on the surface of the ground. Look at the rough map in this article and at a contour map. Imagine the area, marked "normal granite with its contained dykes," to be cupolas with the tops worn off and the remainder of the surface to be roof pendants. We can talk of the Castle Peak valley pendant or the Hongkong harbour cupola. Whether this explanation is correct or whether the normal granite of the Colony has been injected from the side of a batholith into surrounding rocks cannot, I think, be finally decided without the study of some hundreds of square miles of country but the chief point, namely that the normal granite has come into older rocks and solidified below and beside them with a chilled margin cannot be doubted. There is nothing paleozoic about it. With the exception of the 4 or 5 kinds of dykes which traverse it it is probably the youngest rock in the Colony. On leaving the cutting the road is found to pass along the side of an artificial embankment. one cannot miss it, on the lower side of the road the embankment has been planted with cyprus trees with needle like leaves and above the road have been planted bauhinia trees, trees with pecular leaves having a deep notch and named after the two botanists, the brothers Bauhin; guarding the upper embankment is a wall of roughly hewn stones of the normal granite. While on this portion of the road look over the harbour to the land opposite. The Kowloon Feninsular, Stone Cutters Island, the low hills behind Lai Chi Kok and the South side of the Island of Cheung Hue will be seen, the latter to the West of Stone Cutters Island, these all present an appearance which is very characteristic of the normal granite as seen in South China. Instead of being covered with vegetation there are bare patches of red, yellow and white colour visible, especially on the wind swept spurs of the hills, this appearance of bare red, yellow and white patches with boulders is very characteristic of the normal granite and enables one to identify it when many miles distant though there are occasionally dykes of other rocks in it

which weather in the same manner as the granite and need inspection close at hand to distinguish them. If it is a clear day/examine the country carefully with the telescope, note how the Kowloon Peninsular is barer of vegetation than the rest and more deeply gullied and washed free from surface soil, imagine it as it probably was a few hundred years ago covered thickly by trees like the areas behind old villages are to-day where the trees have been preserved because of religious beliefs. The appearance of the Kowloon Peninsular is typical of what follows deforestation of ground which has been deeply decomposed by and at the same sheltered from denudation by a heavy covering of vegetation.

Pass along the road to the end of the embankment and notice that the road goes through a cutting which is very low on the West side and high on the East. Make a careful examination of the sides. No undecomposed rock can be fonud. Examine pieces of half decomposed material, preferably with a lens. You will find flakes of white glittering material which splits easily into innumerable thin flexible plates, this is white mica, it is a very common product of thermal and other forms of rock metamorphism. The decomposed rock is full of small hard lumps about the size of peas or beans, if broken these are often pink in appearance, they are andalusite, a silicate of aluminium and a characteristic product of thermal metamorphism; there are many better places in Hongkong than this cutting in which to study andalusite, notably the fire tracks on the South side of Mount Davis, where rod shaped crystals are often seen standing out in relief on the surfaces of slabs of rock. To the naked eye andalusite is characterised by occuring as long rod shaped crystals which stand out prominently on weathered surfaces of rock and are full of impurities which have been included in the crystals during the process of formation, on section the rods tend to be nearly square and often have a lighter coloured centre.

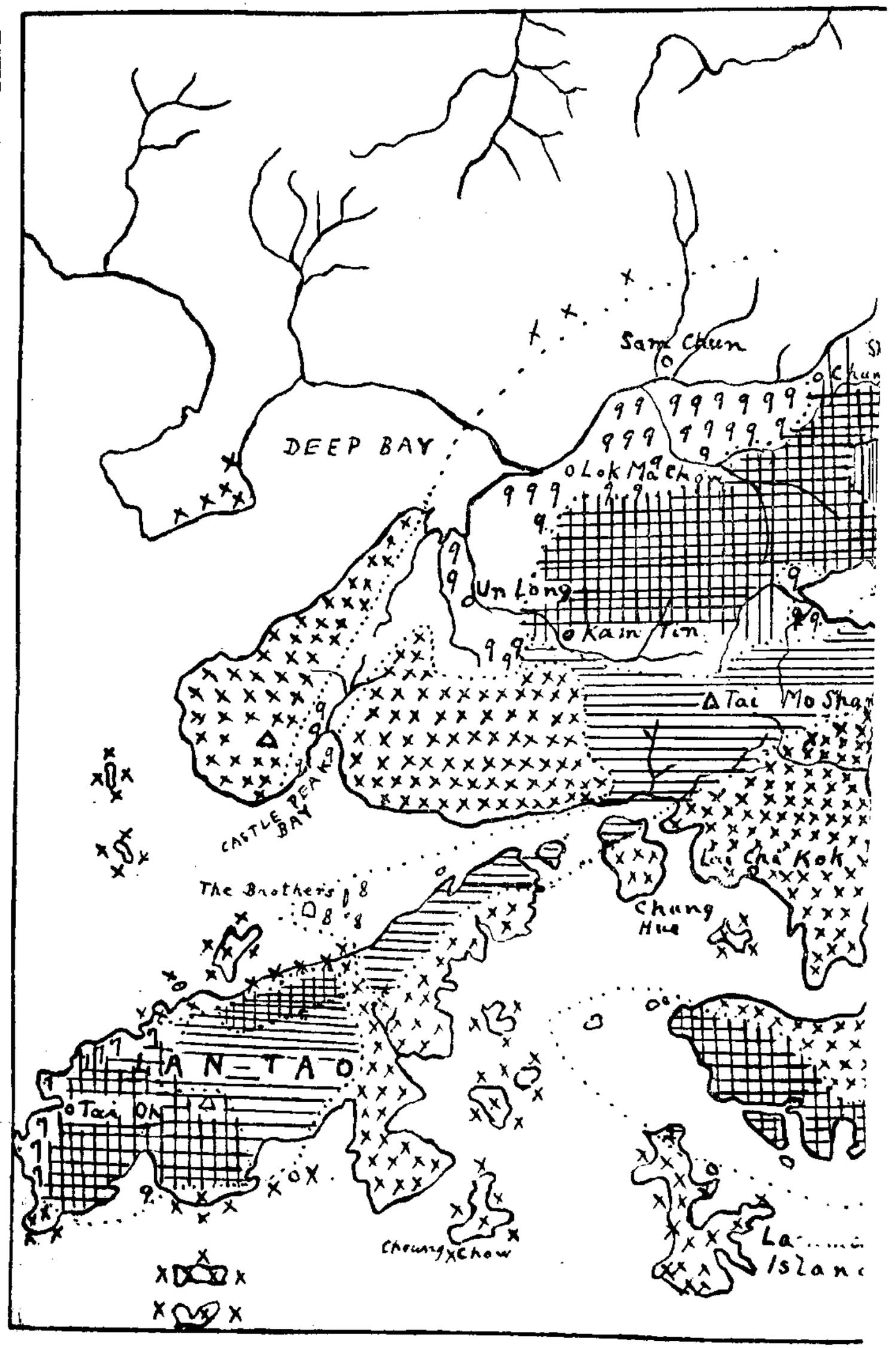
The remainder of the decomposed rock will be seen to consist of a powdery white substance Kaolin stained in most places by oxides of iron, in it are seen many quartz bleb sand, a black mineral, perhaps biotite. The edge of the normal granite obviously was covered by the artificial embankment and we have come onto another kind of rock. The kaolin, full of quartz blebs, is very suggestive that it is an igneous rock and the presence of andalusite is indicative of thermal metamorphism and the white mica also suggests some sort of metamorphic change. We have walked from a cupola in to the edge of a roof pendant. Do not let us too rashly conclude that it is the granite which has baked the side of the roof pendant. A few yards further on the road will be found to be flanked on the East side by a high wall of roughly hewn bluish grey rocks. Pass on to the end of the wall and note that the rock containing andalusite continues for a little beyond the end of the wall till a small untrained nullah is reached and that a few yards beyond the nullah a bluish grey rock appears. The actual contact cannot be seen but it must be just beyond the nullah at the level of the road. The reader is not advised to try to travel up the nullah if he was to do so and make little excursions from side to side he would find soft angular honeycombed

boulders of the andalusite rock on his left and hard rounded boulders of the bluish grey rock on his right all the way up to the Pokfulum conduit and beyond, showing that the contact between the rocks ran high up the hill almost along the line of the nullah. Proceed along the road, note that between the nullah and the University play ground a spur of the hill has been cut through and the bluish grey rock extensively exposed by blasting, note the flow structure of the the rock, look at the rock under the lens quartz can be made out, it is plentiful, biotite can probably be seen. Orthoclase is common. A very small amount of dark coloured ground mass which the lens will not resolve into crystals can be seen. Pass along the road till the University play ground is left behind and the road curves round a spur of the hill, note the presence of the bluish grey rock in the sides of the road all the way and the appearance and rough feel of the rounded boulders and how the crystaline quartz blebs stand out on the surface of the boulders. Note how deeply the rock is decomposed at the place where the road curves round. A hundred yards past the bend in the road a nullah will be found, the road being here supported on its outer side by a high wall of masonry composed of hewn pieces of the bluish grey rock, walk up the nullah and break off some rock and examine it. It is quite different from the bluish grey rock. The ground mass is very prominent, in it are a few felspar crystals, orthoclase, and also crystal one quartz blebs and biotite all set far apart in the ground mass, it is a quartz felsite, one of the commonest rocks on the face of the globe, walk back along the road a few yards not more than forty paces and endeavour to find the contact of the quartz felsite with the decomposed bluish grey rock, you will not be very successful, the decomposition obscures the contact, it is between twenty and forty paces back from the nullah along the road.

Proceed forwards along the road, which has now become level noting the white colour of the decomposed quartz felsite. A few paces will take you to another nullah of large size crossed by an arched bridge, this is the main stream of the Kennedy Town nullah, look down the nullah over the parapet of the bridge the nullah disappears over a high waterfall. What is the cause of the waterfall? Walk back fifty paces and look ovver the parapet of the road endeavouring to see the foot of the fall or as much of the vertical face of it as possible, note how the width of the face is wider than the nullah above and a little distance below the fall and how very wide the nullah is just at the foot of the fall. It all suggests that easily broken up material has been washed away to make the chasm and a vertical joint has separated the weak material from the hard face of the fall. Imagine the plane of the face of the fall to be extended till it crosses the road. At this point on the hill side of the road it will be found that there is a large hollow with vertical walls which has been made by coolies seeking for material which could be broken into road metal with a minimum of effort.

Proceed up into the hollow, note the vertical side walls running nearly parallel, note the slickensides on the walls, these are parallel

groves where one surface of rock has slipped upon another, note the transparent edges of some fragments and how a light blow shatters a large piece into many fragments covered with black crusts of oxides of manganese which have spread alone the joint planes. Imagine the planes of the side walls of the hollow extended across the road and in front of the water fall. This shattered belt of fault rock explains the presence of the water fall for it has been washed away easily. When the reader has had local experience he will be able to note that the North wall of the hollow is a decomposed basic dyke. The same dyke can be found undecomposed near the foot of the waterfall but the student is not advised to go down to look at it on this excursion. Cross the bridge, hard white rock found in the hollow and seventy yards past the bridge is perhaps andalusite hornfels formed by thermal metamorphism of kaolinised rock due to near presence of the blue grey rock which is only a short distance away down the hill. If we proceed the road will soon be found to branch, take the lower branch, this is at first perfectly level. Walk on till it begins to slope downhill, at this point the quartz felsite rock, which we have been on since leaving the blue grey rock, ceases and the blue grey rock is again found, the contact is obscure because the blue grey rock is decomposed to a yellow earth but the position of the contact is about twenty five paces back from a 6 foot path which crosses the road. Proceeding along the road we soon see the blue grey rock in situ. The road will now be found to form two long sweeping curves the first curve having its concavity towards Mount Davis, and the second having its concavity towards the valley, after this the road becomes straight and is bounded by a long low wall made of the blue grey rock. All the way we are on the blue grey rock though in places the joints are so close together and the felspar so altered in colour, often to a salmon pink, that the rock is scarcely recognisable. About 55 paces past the end of the long low straight wall look for the cessation of the blue grey rock. The contact will be found running obliquely up the side of the road about thirty paces before the road enters a curved cutting through a spur of the hill. Trace each rock inch by inch towards the junction till you can put your hand on the contact. Just before the cutting is reached there is a culvert, notice that the plane of the contact is so directed that it would pass above this culvert about the spot where two catchwaters meet above the culvert. Also note that owing to the bend in the road the contact if continued in the same plane would cross the road again near the next bridge. Enter the cutting and note flakes of transparent white mica and irregular lumps of andalusite about the size of beans in the earth on both sides of the cutting also note masses of rock coloured pale lavender pink with andalusite near the beginning of the cutting, all products of thermal metamophism due to the blue grey rock having baked the older rock into which it was injected. Proceed, noting that the road is sometimes on the older rock and sometimes on the blue grey rock, look preferably with the telescope at Cheung Chow Island the double island with a low tie-bar uniting the two halves, note that it has the same appearance as Cheung Hue and the hills near


Sam Chun
DEEP BAY
Lok Ma Chau
Un Long
Kam Tin
Tai Mo Shan
CASTLE PEAK BAY
The Brothers
Lai Chi Kok
Chung Hue
TANTAO
Tai On
Chewng Chow

Li Chi Kok. Look also at Lamma Island and note that the more distant parts of it have the same appearance; refer to the rough geological map accompanying this article. We have nearly crossed the roof pendant and are in site of the next cupola. This excursion may be terminated in various ways. You may proceed along the Jubilee Road to Kennedy Town and home by tram having a good look at the shore near the Far Eastern Oxygen and Acetylene Company's factory and East of it, or you may go back the way you came as far as the Pokfulum Road and then walk back on the Pokfulum Conduit looking for the same contacts as were looked for on the Pokfulum Road. If the day is cool and the tide low you may walk Eastward along the Jubilee Road and walk down past the Tung Wah Mortuary to the sea and examine the green basic dykes at the West side of the bay below the Mortuary. These dykes are of some interest. They are very common in the harder rocks of the Colony and its neighbourhood. They are often associated with worthless lead, zinc and copper ores. They are very rarely more than twelve feet wide; in the telegraph bay nullah there is of this width; most of them are under a yard wide. They often contain much calcite. When very decomposed they weather to a hard laterite which enables them to be traced across decomposed country. They are generally younger than the major joint system of the rocks they traverse. They often form watercourses and if attacked by the sea they often wear leaving a narrow vertical rift in harder rocks. If the reader has studied them in a decomposed state in the bay near the sea he may be able to find three in the blue grey rock on the road as he returns on the South side of Mount Davis, one of these has spread out into a number of stringers, thin films of green material, along the joint planes.

INDEX TO MAP.

The boundary lines of the rocks are only approximate; those between rocks four and five being particularly inaccurate. Rock four sends out intrusions into the schistose quartz felsites of number five which cannot be mapped on a small scale; these are well seen in the range North of the Kam Tin Valley. Rock eight is cut up by igneous intrusions and there is igneous rock between rocks six and seven.

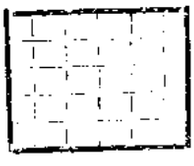
1.—The normal granite with its contained dykes, age probably late mesozoic or tertiary, the dykes being of various later dates.

2.—The calcite bearing conglomerate, age probably late mesozoic or perhaps tertiary. The best sections are between Tip Fuk and Ha Sha in Mirs Bay and on islands and a peninsula between Kat Oh and Sha Tau Kok

2

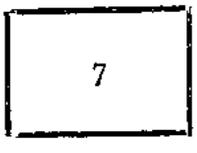
3.—The bitumenous shale, age probably late mesozic. Locality Peng Chow Island, Mirs Bay.

4.—A coarse grained and often nearly holocrystaline igneous rock rich in quartz, apparently too bsaic to be classed as a ryolite, age subsequent to the severe post Jurassic folding.



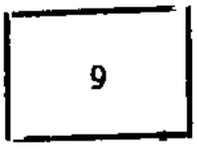
5.—Ryolites, Félsites and quartz felsites and other igneous rocks of various ages many have suffered igneous rock rich in quartz, apparently too from the post Jurassic folding. Many are intrusive into rocks six, seven and eight, others into rock four.

6.—The red formation, probably marine Jurassic or Triassic Locality summit of Pat Sin range to Mirs Bay also Port Island. The best sections are at Hung Shek Mun near Wong Wan in Mirs Bay and from Sha Tau Kok police station to the Chung Mi waterfall.



7.—The quartz pebble conglomerate and quartzite with shales, probably marine lower Jurassic or Triassic, best sections North side of Tolo Channel, Bluff Head and South East of Sha U Chung, Mirs Bay. The quartzites of Tai Pung mountain and shales North East of Tai Oh and conglomerates South East of Tai Oh are tentatively put in the same formation. The quartz pebble conglomerate is a very striking rock closely resembling the banket reefs of the Witwatersrand though thicker.

8.—Probably fresh water lower Jurassic or Triassic. The best sections are on the peninsula North West of Nam Shan where there are fossil leaves and also West and North of Sham Chung all on the shore of the Tolo channel and three fathom cove. The Islands called the Brothers South of Castle Peak Bay may perhaps belong to the same formation as there are regularly bedded graphites like old coalseams at the South West corner of the West Brother.



9.—Sedimentary rocks perhaps of lower Jurassic or Triassic age. The best sections are on low hills around Un Long and along the Sham Chun river from Lok Ma Chau to Chung In Ha. the island in Castle Peak Bay, the Peninsula West of Shui Tau Sha on the East coast of Mirs Bay, the islands of A Chau and No Kot Chau in The Tolo Harbour and at Kat Oh.

10.—Dark coloured schists with white crystaline limestone. Locality North of Sha U Chung, Mirs Bay. | 10 |

The hypothetical ages of the rocks mentioned in the index of the map are based on the following observations.

Rock one is chilled against rock two near Tip Fuk and cuts across the line of strike of rock seven South East of Sha U Chung.

Rock two has an East West strike and a dip of about 5 degrees North on both sides of Mirs Bay, it therefore probably lays across the upturned edges of rock seven, the unconformity being one of great magnitude. It contains fragments of red septarian nodules exactly like ones found in situ in rock six, it also contains boulders of an older conglomerate, and these boulders also contain the red septarian nodule fragments. There is therefore probably an unconformity of great magnitude between rock two and rock six.

Rock three is a bitumenous shale containg much calcite, its dip is about 15 degrees, it contains well preserved but very fragmentary plant remains which burn with a bright flame, I sent some specimens to England and Professor Seward reported that they were too fragmentary for identification but were very likely to be of late mesozoic age. The attitude of this rock and its calcite suggests that it should be classed with rock 2. The state of preservation of its plant remains suggests that it is later than the severe post Jurassic folding that has affected rocks six and seven.

Rock six lies above rock seven with an unconformity of considerable magnitude, its conglomerates are often schistose.

Rock seven has a nearly North-East South-West strike and dips about 80 degrees, I have found ammonites of a lower Jurassic appearance in shales towards its base. These shales are commonly schistose. The country has been severely folded on a North-East South-West axis since Jurassic times.

Rock eight contains ferns and leaves resembling those of cycads. Its plant remains and its close proximity to rock seven in the Tolo Channel suggests that it is Jurassic or Triassic in age. The Jurassic and Triassic rocks of China contain coals of economic importance but in this neighbourhood the plant remains appear to have been mostly changed to graphite by igneous intrusions and the intensity of the post Jurassic folding but the plant remains in rock three have not thus suffered.

Rock four appears not to have suffered from the severe post Jurassic folding but is intruded into rocks which show the folding.

The rocks of this Colony are fragments cut to pieces by the sea and the granite, no description of them can be at all or accurate without corelating them with those of the neighbouring Province.

In conclusion I have to thank the following from whom I have obtained useful ideas. Mr. A. C. Franklin who has cut sections of many of the rocks of the neighbourhood. Mr. W. Schofield, Mr. J. S. Lee, Mr. Wong Wen Hao, Mr. Barney of the University and Mr. A. H. Crook of Queen's College.

MEMORANDA.

C.M.M.A. CONFERENCE.

SHANGHAI, FEBRUARY 1923.

It was my privilege to travel to Shanghai in one of the finest ships in the world. It was like spending the week end in a French Chateau—but it was my misfortune to arrive at Woosung, in a wet drizzling fog, where we waited from 11.30 a.m. to 5 p.m., before being transferred to the tender. At last we made one of the most miserable journies up the river it has been my lot to share and arrived at the Customs House jetty in the dark about 6. 30. After scrambling through the customs I found a comfortable hotel and with the aid of a cheerful fire wrote an introductory address on the relation of Physiology to Medicine.

Next day I sought out the McTyiere's School where the Conference was to be held, but finding myself unable to face the rigors of the Shanghai climate, I decided to return to the hotel. At this juncture, however, I consulted Dr. Harston with wonderful results—a really warm house near the School had been placed at his disposal by a good friend who, strange to say, preferred a draughty house-boat, wild duck and wet marshes. After that I felt contented and happy and was able to settle down to the serious business of the Conference.

It was, of course, quite impossible to attend all the meetings and I do not propose to give a detailed account of all I did.

Public Health.

The question of Public Health naturally occupied a good deal of the time of the Conference. In addition to the afternoon sectional meetings, two general sessions were given up to its consideration, and there was also an evening address on Pasteur by Dr. Noel Davis, Director of the Shanghai Municipal Laboratory.

Dr. W. W. Peter gave an account of his work in India, while Dr. Wu Lien Teh showed his cinema pictures illustrating the work of the North Manchurian Plague Prevention Service. There was also a display of posters and models suitable for popular education in Hygiene.

I cannot help feeling that this University would do well to pay more attention to training in Preventive Medicine, and that something should be done to introduce Hygiene more effectively into the primary and secondary schools. It was pointed out to me by several people who ought to know, that the present training of Chinese medical

graduates is doing nothing to further the education of the Chinese people and that until the people recognise the value of modern sanitary methods, the health of China will still remain very much what it is at present. As Dr. Balme says in his book on "Modern Medicine in China," what is lacking in China, in Medicine and elsewhere, is a sense of public responsibility and trust, and the present western curriculum which is almost entirely confined to the teaching of curative as opposed to preventive medicine, rather encourages the present attitude. At the same time, I realize that it is very difficult in a curriculum which is already rather overloaded to give more time to the subject. It seems that the solution must be sought first, in introducing, as Sir George Newman has suggested, what may be termed the preventive aspects of medicine into the present courses and second, by giving post graduate courses for a D.P.H., as in other universities. The first method would appear to be most generally useful, and could well be carried out, especially in the teaching of Obstetrics and Gynaecology. Strictly speaking, Hygiene is not a separate subject, and although convenient for curriculum purposes, it should not be taught as if it were.

I hope when our clinical units are in full working order, it may be possible, by co-operation with those more directly concerned with what is termed Public Health, to give students, during their ordinary courses, some conception of their public as well as their private responsibilities in the general field of medicine.

Parasitology.

There was also an exceedingly good section of Parasitology presided over by Dr. Faust of Peking, in which practical demonstration was the chief feature. It must have been of great value to those attending the Conference from country districts where it is difficult to obtain laboratory help in this very important aspect of medical practice in China.

Medicine.

In the section of Medicine, Dr. McLean, Professor of Medicine at the Peking Union Medical College, read a paper on Diabetes in which he dwelt especially on the new discovery of Insulin. Dr. McLean was in America recently and has a first hand knowledge of the whole subject. He is proposing to manufacture the new drug at Peking and has promised to let us have a sample as soon as the process has been tested out.

There is no doubt that the isolation of Insulin from the pancreas represents one of the biggest achievments of experimental medicine during the last 20 years and should provide a great stimulus to those working in the field of endocrinology.

Physiology.

In the section of Clinical Physiology, Dr. Cruickshank read an interesting paper on his own research work on Experimental Tetany and helped us to realize how important it is nowadays to have clear ideas on the question of calcium metabolism and blood reaction and how fundamental is the maintenance of blood neutrality to the physiology of the whole body. Dr. Preston Maxwell in the section of Gynaecology and Obstetrics drew our attention to the prevalence of Osteomalacia in Chinese women and also made it clear how necessary it is that we should increase our knowledge of Calcium Metabolism.

The question of Chinese diets was dealt with by Dr. Adolph of Shangtung and Dr. Peck of St. John's University, Shanghai. Dr. Adolph told us that we ought to study Chinese diets in the home as well as in the institution, and this warning was confirmed when Dr. Peck gave his figures for St. John's University. On the surface it appears that students in Western institutions in China are overfed and that the Chinese have learnt the art of living economically in their homes in a way that Westerners would do well to imitate. Dr. Hsien Wu of Peking gave us an interesting paper on Blood Analysis in which he made it clear how much more important it is to know the composition of the blood than that of other fluids, if we are to form any conception of the chemical environment of the tissues.

The new methods of Van Slyke and others, among whom Dr. Wu must be included, have made blood analysis possible as a routine measure and it is to be hoped that these methods will soon become more generally used.

Dr. Kiang of Tsinan gave a demonstration of Van Slyke's method of measuring the CO_2 and alkali reserve of the blood and Dr. Totani of Dairen, Manchuria, whom I met in Cambridge in 1915, showed the value of the Electrocardiograph in the study of pericarditis.

Last, but not least, Professor Shellshear's work on the Chinese Brain, Dr. Cadbury's paper on Anthropometry and Dr. Van Buskirk's paper on the Urine of Koreans proved how important it is to establish racial standards before using exact methods in the diagnosis and treatment of disease as it occurs in different peoples.

Otology.

Dr. Digby sent a paper to the Ear, Nose and Throat Section on the "Indications for Tonsillectomy" but it arrived too late for reading; it will no doubt be published in the China Medical Journal at a later date.

Ophthalmology.

Dr. Harston took an important part in the section of Ophthalmology by contributing a paper on Glaucoma in which he described a new operation and by active participation in the general discussions.

Pharmacology.

Professor Read of Peking was as usual very active, this time as Chairman of the new section of Pharmacology. Such important subjects as "A Standard Materia Medica for China" and "Chinese Drugs of Therapeutic Value to Western Physicians," found a place in the programme and I was very sorry that the time arranged for the section prevented me from putting in an appearance.

Medical Ethics.

Perhaps one of the most important of the General Sessions was that devoted to Medical Ethics. This subject was introduced by Dr. Merrins, Editor of the Journal, in a paper which was printed and circulated to members at the beginning of the Conference. This practice is a very useful one, since it enables more time to be spent in general discusson. Arising out of his paper Dr. Merrins suggested that he thought the time had come when the scope of the Association should be broadened and the title accordingly changed to China Medical Association. I think it may be said that this idea met with a general approval and it was referred to the Executive Committee for report to the next conference. There is rather a tendency nowadays to multiply societies and associations and it is felt that it will be better for the future of medicine in China if the scientific and ethical aspects are controlled through one big association in which all practitioners holding a reputable western degree or diploma are eligible for membership, irrespective of creed and race.

Next Conference in Hongkong.

At the end of the Conference the place of the next meeting came up for decision and an invitation to meet in Hongkong which it was my privilege to offer on behalf of the Hongkong and China Branch of the British Medical Association in 1920, was renewed and accepted for 1925. This will be the first time the Conference has decided to meet in Hongkong and will provide an opportunity for the University to show what it is doing as a medical centre for South China. There is no doubt that the C.M.M.A., is only too anxious to admit Hongkong to its membership and has shown this by electing a representative from the University on the Research Committee of the Association and by the suggestion of an Editorial Board for the China Medical

Journal on which Hongkong should be represented. In this connection the following extract from the Editor's report presented to the Conference, on the relation of the C.M.J. to other medical journals, will I am sure to be of interest to our readers. "At the present time there are two medical journals, foreign or partly foreign, other than our own, published in China; the National Medical Journal and the Caduceus, the journal of the Hongkong University Medical Society. The Caduceus began its career only a few months ago and evinces no desire to have its infant life brought to a sudden ending by amalgamation. In an editorial in the second number (October 1922) it is said; 'Nevertheless we do feel that whatever may be the outcome of the present move, the Caduceus, the Journal of the Hongkong University Medical Society, has a mission of its own to fulfil.'

The National Medical Journal is the organ of the National Medical Association of China, composed exclusively of Chinese practitioners of Medicine. At present it is printed partly in English and partly in Chinese: to Chinese doctors who prefer the English language, the Chinese part is unnecessary; to those who prefer the Chinese language the English part is unnecessary. It seems anomalous that a journal claiming to be national, should be printed, at least one half of it, in a foreign language. In this opinion, that the National Medical Journal should be wholly national, the Chinese editor of the Caduceus apparently concurs, for after questioning the soundness of the statement that many Chinese physicians find the English language their most suitable medium, he writes: 'We believe that the production of a medical journal in Chinese will be inevitable. Indeed, the present Chinese section of the National Medical Journal can be looked upon as a nucleus for the creation of such a periodical and we are sure that the founders of that journal have that object in view: after all the Chinese language is their mother tongue!"

MEDICAL EDUCATION.

Shanghai.

The general subject of medical education under Christian auspices was discussed, at a special business session of the Conference. The report of the recent Education Committee, in which it was suggested that all medical education under missionary control south of the Yangtze should be concentrated at Shanghai, did not meet with the approval of the South China, Hankow and Changsha delegates and the whole question was shelved for consideration during the next biennium. The opinion was freely expressed that a school at Shanghai with English as the language of instruction did not offer any advantages which could not be obtained at Hongkong and that it was not likely that Cantonese would go to Shanghai for their education.

Canton.

It is pretty certain that during the next biennium a great effort will be made to establish a Union Medical School in Canton, with Cantonese as the medium of instruction on somewhat the same lines as the school at Tsinan where Mandarin is the language used.

I feel sure that there is a field for such a school and I hope that when it matures, it will be possible to establish closer relations in medical education and research between Hongkong and Canton than at present exist.

Hangchow.

After the Conference was over, finding myself with a day to spare before returning to Hongkong, I went to see Dr. Apricot of Heaven Below or in other words, Dr. Duncan Main of Hangchow. Dr. Main has spent either all or part of every year in China since the early eighties and has gradually built up a wonderfully complete medical organisation including a general hospital, leper hospital, tuberculosis hospital and medical school, to say nothing of numerous sanatoria and rest houses for people of all positions and classes in the vicinity. The work is so extensive and widely distrbuted that it is doubtful whether Dr. Main will be able to secure one man to succeed him and accept sole responsibility.

Dr. Main has been greatly assisted in the work by Mrs. Main. Recently he received a donation of £10,000 sterling for the medical school, the development of which has been much hindered for want of funds. Dr. Main also feels that there is a real need for the local teaching of western medicine in the Chinese language and is of opinion that it will be a long while before schools such as the Peking Union Medical College and the University of Hongkong can supply the immediate and pressing need for western trained medical men in China. There is a good deal to be said for this point of view—it is no good providing medical schools where the primary and secondary schools cannot reach the matriculation standard in English and from where the graduates will not go into the interior. Men like Dr. Duncan Main are doing a great work in China for they are at great sacrifice meeting the immediate needs of the country in the only way at present possible in their districts.

General Conclusion.

It was certainly one of the best Conferences that have been held and when the history of the introduction of medicine into China comes to be written it will no doubt be recognised that it was

at this Conference that a big step forward was made, through the wisdom of the late Secretary of the C.M.M.A., and of the Editor of the C.M.J. It must have required great courage for them to put before their colleagues views which would lead to such an important change as that of the title of the Association. But by opening wide its membership to all western trained physicians there is no doubt that the Association will be able to exert a wider influence than before and will be able to prevent the spread of a commercialism in medicine which is contrary to its best traditions.

The fact that western medicine has been introduced into China by Christian Missionaries is a fact upon which China may well be congratulated. For although western medicine at the present day in Europe and America is not distinctly Christian, it must not be forgotten that practically all the most ancient hospitals and medical schools in London and elsewhere owe their existence to Christian foundations, and in many cases are named after Christian Saints—further, Christianity has played an important part in establishing the code of ethics, which the best western physicians instinctively obey. There is a great danger in introducing western medicine into a country in which material standards are paramount, and even in Europe and America to-day there is a great danger of the profession of medicine becoming commercialised.

While it is not possible, however, for all western physicians to accept the complete Christian and therefore missionary position, it is possible for them to accept the medical ethic which has grown from the contact of medicine with Christianity and it will be possible by widening the scope and title of the Association to include many who will work for the spread of the best medical traditions and who will fight against any breach of sound ethical principles.

Research.

I will conclude these somewhat rambling reflections by calling attention to the programme which Dr. Cadbury has drawn up on behalf of the Research Committee and by asking all who can, to co-operate in some section of the work outlined:—

The Committee appointed has selected a list of some of the most important and practical questions of research and is sending out a circular letter informing members of the general nature of these problems and of the name of the individual who is most interested and best qualified to give advice on the questions involved.

While the object of the Committee is to correlate work done by others, yet this does not preclude individuals from publishing their own findings independently.

The subjects submitted for research are as follows:—

1.—Vital Statistics, Nutrition and Growth of Childhood.

Dr. V. B. Appleton.

Council of Health Education, 4, Quinsan Gardens, Shanghai, This subject should appeal particularly to doctors connected with schools, and those interested in pediatrics.

2.—The Incidence, Distribution, etc., of the various Intestinal Parasites of Man.

Dr. C. H. Barlow, Shaoshing, Chek.

Dr. Faust has made a preliminary survey, and his syllabus can easily be obtained for use in this study.

3.—Physical Anthropometry and the Relation of Dentition and Dental Caries to Age.

Dr. Davidson Black, or Dr. Paul H. Stevenson, Dept. of Anatomy, Peking Union Medical College, Peking. This problem can be most readily taken up by physical directors and college physicians in schools and colleges. Something has already been done along these lines, but there is much of value to be worked out.

4.—Endocrine Disorders and Blood Pressure.

Dr. E. W. H. Cruickshank, P.U.M.C., Peking.

These subjects may be studied by those working in Physiology and Physical examination of students.

5.—The Assessment of Physical Fitness with special reference to Physiological Anthropometry including Basal Metabolism Vital Capacity, Pulse Rate, etc., in relation to Weight, Height, Chest, and Stem Measurements.

Dr. H. G. Earle, Hongkong University, Hongkong.

There is a great need for determining the standards of physical fitness for Chinese.

6.—The Physical Examination of Students and Physiological data obtained by such work.

Dr. John R. Foster, Hunan Yale Medical College, Changsha Hun.

Every school or college physician should contribute to this problem.

7.—Pelvic Measurements of Women, Fetal Measurements, The period of onset of the Menses, and of the Climacteric.

Dr. J. A. McBean, Kongmoon *viâ* Canton.

Here is a subject for all physicians engaged in Obstetric and Gynaecological practice.

8.—Chinese Drugs of Therapeutic Interest to Western Physicians

Dr. Read P.U.M.C., Peking.

A small beginning has been made in this work but every physician should endeavour to collect information concerning Chinese remedies and then submit them to Professor Read or some other chemist for analysis.

9.—Study of Diets and Food, Urine Analysis, Deficiency Diseases (Avitaminoses).

Dr. J. D. Van Buskirk, Severance Union Medical College, Seoul, Korea.

Some papers bearing on these subjects were read at the Shanghai meeting. These may well serve as a basis for future study.

10.—Splenomegaly and Anaemia.

Dr. C. W. Young, P.U.M.C. Peking.

A most fascinating field of study is opened up here. There are doubtless forms of splenomegaly found in China for which no adequate etiology has yet been determined.

It is hoped that in every hospital and medical school one or more of these topics may claim the careful attention of members of the staff in order that two years from now substantial contributions may be made to our knowledge of these various conditions in China.

H. G. E.

ANTI-MALARIAL RESULTS.

History abounds with the monuments made by man. We gaze in wonder at the pyramids of Egypt, at the great wall of China, and marvel at the stupendous labour which has been expended on the sport of kings. In Rome we see the monuments remaining to tell of human sacrifice and human cruelty. To-day no less the untiring energy of man builds hundreds of miles of trenches, concrete emplacements, great engines of war both on land and sea. Within our own vicinity Hongkong stands to testify to the courage and imagination of man. Analysing all these great works in order to arrive at some cause impelling man to such activity, we are amazed to find that the most ancient of them were impelled by the fact that man believed in the immortality of his body; originally all these monuments were built to give accommodation for the dead and the attendants on the dead. In the fact that man came into the consciousness of his being and wondered, we find their explanation; all ancient buildings are related with death: Probably the discovery of metals, the advent of navigation the origin of the arts and sciences are to be accounted for by the mystery of death; certain it is that the first investigations in anatomy were related to the practice of mummification. The second class of great works such as the Great

Wall of China, the trenches of France, and the engines of war are related to factors which concentrate on the destruction of man. The third great category of works are built with the sole object of enriching man and in particular certain favoured classes of men When history comes to form its judgment it is questionable whether our generation will be considered as having advanced very considerably above their ancestors the pyramid builders.

But when that history is written, perhaps the most outstanding chapter will be that written on the work of the Rockefeller foundation. History will tell of a work which in extent and significance will outstrip any monumental, defensive, or commercial work of any age. One can enter into the spirit of the writer who, analysing the ultimate background, will tell of the desires and dreams of labourers in the field of health. how in the realms of science commercial enterprise has availed itself of the discoveries of science, how the works of science have continued to be produced in the face of poverty and robbery. What scientific man does not realise the potentiality of the weapons at his disposal, the economic and other benefits possible to hand out to humanity. One thing only he can not guarantee and that is that a balance sheet can be produced for the scrutiny of commercial and political men. Since no balance sheet and no monetary profits are immediately recognisable the output on scientific endeavour must be the first expenditure to be curtailed.

History will relate how in an age of apparent enlightenment progress was hindered by the lack of foresight of the political world, but how at this very juncture the millions of Rockefeller were thrown into the arena of science, how in America it had the almost immediate effect of stimulating a national scientific conscience so that one university after another became solvent. An enlightened public asked for a balance sheet but not in dollars; the balance sheet became one of public health and mental elevation.

What previous monument of man has extended beyond the confines of a particular country; what previous monument has included the whole of humanity in its fold?

We can tell of several of the results of scientific labour: In our adulation of gold, and in our delight that commerce has awakened, are we to compare this enlightened gift to the work of certain individuals in the world of science who have relieved the distress of people? The works of Pasteur, of Lister, of Koch, and other labourers in the field are unique and incomparable. What nation has limited their gifts to its boundaries? But that of which we speak belongs to a different category; We can tell of local and generous gifts such as the Challis gift to Sydney University of £250,000 for the sole purpose of paying the salaries of professors, great gifts like those of Carnegie. Once again remembering the widow's mite, we do not compare; but we can not refrain from expressing our satisfaction that we have an earnest of the time when commerce

will refrain from being a parasite on science and will hand to science its commission on wireless, on forms of transport, on dyes and chemistry, and on the results of science in general.

We confidently predict that the hospitals and universities of the United Kingdom will benefit from the example set at University College London where the King is shortly to open the new Institute of anatomy and will lay the foundation of the additions to the hospital endowed by Rockefeller. It is inconceivable that appeals will continue to be heard in London for hospital upkeep after the long overdue trade revival sets in.

But while sensible of the magnitude of the work of the Rockefeller Foundation and grateful that its tentacles have reached Hongkong our aim is to tell of their work on the eradication of malaria.

The reports of investigators employed in the foundation tell of difficulties to be met in the combat.

These difficulties or resistances are capable of classification into three main groups, commercial, educational, and geographical.

One of the foremost difficulties to be met is the commercial. Will the expenditure on antimalarial measures reduce the profits of the undertaking? Provided that labour is cheap, is it not more economical to accept the losses incurred in sickness and death, if more labour becomes immediately available? The moral side of the question is outside the range of commercial politics. If business were conducted by individuals the case would be different but to-day we deal with shareholders, and frequently these shareholders depend for their existence on an adequate return. What meeting of shareholders can afford to discuss whether the profits of a concern shall be curtailed to alleviate the suffering of the employees? It has to be demonstrated that not only will the profits not be curtailed but also that the eradication of the disease will increase the dividends before one can hope for intelligent co-operation. Such a result has been shown. The eradication of malaria has more than compensated for the expense in eradicating it.

Doctor Carter says with regard to malaria control "We hoped that if it commenced on one railroad it would go to the others. Only one of them has taken it up since that time—the Central of Georgia. They claim they cannot afford the expenditure but to my mind they can't afford not to make the expenditure. They spend four times as much for the loss of labour by sickness as they would to prevent the sickness."

On the other hand we find that the knowledge of the economic losses sustained by illness is being recognised in America Dr. Fuchs of the United States Public Health Service has compiled statistics on the economic losses from malaria. In summing up the losses he says that the average loss works out at $82 per case of malaria, "but most of these inquiries failed to include all the causes of loss considered above."

He quotes from letters received by him and these are well worth putting on record. We would like to see these figures estimated in terms of added comfort to the individual rather than in dollars, nevertheless if only in the interests of business efficiency the malaria control is worth while.

"The writer has held for years that one of the greatest assets of a manufacturing business is the health of the crew; that you can not make any money with a man when he is sick, therefore keep him well; that you can not make as much money with a man when his family is sick, because you do not have his thoughts and attention on the work, as it is occupied with considering the condition of his family, therefore keep his family well, and to that end we provide every safeguard that we know of."

"The money spent in antimalarial work here has paid the quickest and most enormous dividends I have ever seen from any investment, and that after having had our experience I would, if necessary, do the work over again if I knew it would cost 10 times the amount. Our experience has taught us that the eradication of mosquitoes is not only the proper thing to do from a strictly health standpoint, but it is an exceedingly profitable thing to do."

I will make a final quotation from the Public Health Bulletin No. 125 and one can not help feeling how Manson would have endorsed it. "There could not have been a better campaign for any purpose than this one, and the money spent was the best investment we have made during my regime. WE WANT TO URGE OUR SUCCESSORS TO KEEP THIS GOOD WORK GOING."

But whereas considerable persuasion would appear to have been necessary to impress upon those responsible for the welfare of their employees the reports of the International Health Board and of the United States Health Board tell of cases where the directors and others have been anxious to aid in the work.

The financial viewpoint is not however the only one which it has been necessary to impress; Perhaps the most difficult cases to be overcome are those in which the supervisors and others ridicule the project put forward on the grounds that good as they may be in theory they do not come within the realms of being carried out satisfactorily because the workmen would not co-operate. A feeling was plainly manifest among some of the subordinate officials, such as supervisors and roadmasters, that little was to be gained by the contemplated measures of attack. Frequently the writer was told that the negro labourers would not sleep in the camp cars in the hot weather and that the screens would be torn off the houses and similar damage done that would render the screening a waste of money." The writer goes on to show how all these predictions were entirely unwarranted and that the cases of malaria became so reduced in number that the formerly rather antagonistic subofficials completely changed their attitude.

Perhaps the most common argument brought forward as an excuse for the prevalence of malaria in Hongkong is "well, what's the use, the Chinese won't carry out the project."

The second difficulty to be faced in commencing any concerted attack is to have the co-operation and intelligence of the community. The methods employed have been propaganda and education in the schools and in scattered communities.

The method of propaganda has aimed at getting the sympathy and help of the press and we find in the reports a whole section dealing with this subject. The writer E. B. Johnson points out that the average scientific man is a poor propagandist. Who is going to read an article by a doctor on malaria? It becomes so involved and technical that people won't read it, they like to read something more readible; and again who ever believes a doctor? So in starting a campaign in a district the engineer who has to do the drainage and other works goes on ahead and gets into touch with the people. In this way the ground is prepared beforehand for the medical man to start in with the sympathy of the people behind him.

The method of school education has been very much used and one can look forward to the time in America when every school boy will know the varieties of mosquito when he sees them and if it is drilled into him in his youth he will never permit slackness on the part of those responsible for public health. This of course refers to places where the public have a responsibility and voice in the government of a community. E. H. Magoon sums up his contribution by saying that "Educational campaigns in schools and other places tend to give the public information about mosquitoes and malaria. The more general the information on this subject, the greater the local efforts that may be expected toward controlling this disease."

When one considers the enormous tracts of country over which the international health board operates there is no need to stress the geographical difficulties to be overcome.

Now having dealt with the employers, the employees and the general public, what steps have been taken to eradicate the disease and what results have accrued?

The methods of attack can be divided into attacking the mosquito and attacking the host. If all people suffering from malaria were segregated would the mosquio be malarious?

No answer is given to this question but in all works in the area dealt with, the employees are housed in wire-proofed houses, not in matsheds. On the railways the rolling stock used by the railway gangs was wired in and even if one was present with the disease it is not conveyed to his neighbour or perhaps to some child of the population a few houses away. "It was decided to concentrate efforts chiefly on this branch, and section houses and camp

cars were carefully examined as to mosquito proofing possibilities. "Some of the cars were condemned as unfit for use, and 14 were entirely screened with No. 16 mesh galvanised wire at the average cost of $57.25 per car." "During this year there have been 116 section houses screened at a cost of $2,365.12. or an average of $29.40 each." "By means of a recent canvass covering the same section crews and camp car outfits as were canvassed in 1919, a reduction in prevalence is noted from the rate of 43.9 per cent. of that year to 6.3 per cent. during this year, only 14 cases and 101 actual days lost in a total of 222 men worked during the malarial season, a definite reduction of 85 per cent. in prevalence rate."

In cases where the mosquito control is too difficult the use of quinine as a prophylactic has been effective; the president of the Rockefeller foundation in his annual report says that "the use of quinine when mosquito control is too difficult, have been tried in various combinations, most of them with a success that has been strikingly convincing."

This bears out the results found by Dr. Wickliffe Rose in 1919. It is imperative that the attack shall not be confined to the mosquito therefore but must be directed on the malaria carrier himself. Before making an attack in war and distributing his orders to subordinates a general must make out an appreciation of the situation; many and diverse factors are taken into account, the general political situation, the food and water supply, the state of mind of the inhabitants, the morale and habits of the enemy, the state of mind of the troops at his disposal, etc. The Rockefeller Foundation can well be compared to the general staff of an army in this matter of public health and they have to study and appreciate more than merely the scientific measures concerned in the attack.

The Mosquito:—

"The direct annual cost of the sickness and death that it produces in India alone is estimated at about $284,000,000; and this does not take into consideration the vastly greater losses due to the impaired productive power of labour."

"Of the 1,600,000,000 inhabitants of the earth, more than half live in countries in which the infection is prevalent and constitutes a serious menace to life and health and working efficiency."

The malaria may be successfully controlled by effective anti-mosquito measures alone. The measures are in part well known and include drainage, paraffin on the surface of the water, etc. There are however some interesting suggestions in the reports and Dr. Howard reports the use of an indigenous fish "Gambusia Affinis." As he says the use of paraffin on the water whilst it will destroy the mosquito larvae at the same time drives off the natural enemies of the larvae. There is no cheaper method of dealing with such a pest than to pit nature against it. In California the lady bird was introduced to eliminate the scale pest on fruit with most striking

result. Such a method is, of course, much more economical. Where the tob-minnow (Gambusia Affinis) is indigenous, or whence it may be introduced and bred in large numbers its use as an agent for mosquito control is attended with no further cost than that incurred for its capture and transportation."

The use of this fish seems to hold out considerable promise of success in those places where it can be bred.

Roubaud reported in 1920 the successful use of trioxymethylene in poisoning the mosquito larva and this line of investigation was extended by Barber. The larvae will swallow all floating substances on the surface of the water and are quite indifferent as to whether they are food or poison—just so that the particles are small enough to enter the mouth easily. Moreover poisons in the form of fine powder are very conveniently distributed. Barber worked on certain compounds of arsenic with uniformly good results. His paper is to be found in the "Transactions of the third annual conference of malaria field workers! Treasury Department United States Public Health Service." 1922.

In these reports no mention is made of the possibility of the mosquito being found in salt water pools just above high water mark. It seems to be a fruitful line of research in Hongkong.

To sum up, the resources of the Rockefeller Foundation having been applied to the eradication of malaria, one looks forward confidently to the time when this disease will be as rare as so many other diseases which were prevalent in countries prior to the advent of an intelligent health administration. But not only is this necessary, the public must also be educated to a sense of what is possible. To fail to report a criminal offence is in itself an offence. To fail to report the nidus or source of a disease should be regarded in a similar light. If a resident of this colony should walk from Hongkong to Repulse Bay and during his journey should observe in every bit of stagnant water alongside the road mosquito larvae in large quantities one can imagine it as an offence if the time of the walk is supposed to be five years hence.

ANNOTATION.

A CASE OF AMYOTROPHIC LATERAL SCLEROSIS.

C. C. Female aged 21 was admitted to the hospital on the 28th March, 1923 for:—

1.—Inability to walk.

2.—Clonic spasms of both legs.

Family history.

Parents all well.

Relatives none of similar disease.

Previous history.

No serious disorder of any kind.

Personal history.

No venereal disease
no bad habits } alcohol, opium or tobacco.
Negative Wasserman.

C.O.A.

Patient came into the ward in a sedan-chair. Both her legs were in a state of spasmodic contraction. She was unable to walk and was carried to her bed on a stretcher. Patient looked pale and anaemic.

Temperature ..... 100° F.

Pulse 82

Respiration shallow and 24 a minute Patient is somewhat wasted, the wasting being more marked on the left side, the thenar hypothenar and Interrossei muscles being especially affected. All the limb muscles are flabby. The legs are spastic but the arms are freely movable and easily flexed. Fine tremors of the fingers can be perceived when the arm is raised, the fingers are slightly bent tending to be claw-like, gripping an article being out of the question Patient can feed herself slowly but with great difficulty. She can however swallow with ease.

Present history.

The disease which manifested itself a year and five months ago, started in the form of weakness which attacked first the fingers of her left hand and then a month later, the toes of her left leg. The weakness was accompanied by much clonic spasms and numbness. The weakness and numbness soon gained ground by rapidly spreading up the limbs so that in a short time they became useless, the leg being spastic, 4 months later, *i.e.*, 5 months after the ailment began, the toes and fingers on the right side became simultaneously affected the weakness and numbness involving the leg and arm in exactly the same manner, *i.e.*, by spreading from the extremities upwards and causing the same damage. The arms however did not contract so violently as the legs. She has not been walking for one year and two months.

Cardio-vascular system
Respiratory ,, } all normal.
Urinary ,,

Alimentary System.

She has suffered habitual constipation from childhood. She goes to stool once in every three or four days or sometimes even a week. Her appetite has always been good. There was never any vomitting.

Nervous System.

The epicritic sense—heat and cold sensations and pain sense are all normal.

Knee jerk and elbow jerk are both exaggerated:—

Babinski is markedly present.

Ankle clonus is markedly present.

Knee clonus is markedly present.

Jaw jerk can be elicited. This reflex according to H. Letheby.

Tidy is present practically only in Amyotrophic Lat. Sclerosis.

No Nystagmus.

No Argyll-Robertson pupil.

S. A. M. SEPHER

(Senior Medical Ward Clerk).

CURRENT MEDICAL LITERATURE.

TUBERCULOUS AFFECTIONS OF THE TONGUE.

By R. M. Handfield-Jones (Lancet, 1923, 1, p. 8.)

The author reports five cases which have occurred in general surgical hospital practice at the St. Mary's Hospital, London, within the last two years. He gives statistics which show that lingual tuberculosis is a very rare disease, constituting not more than 0.063 per cent. among tuberculous subjects. Portal, in 1804, is generally credited with the description of the first case, but it was in 1872, however, that Enteneur published the first authentic primary case. Since then some 231 cases have been recorded, including 26 claimed to be primary. The author believes that the rareness of the condition in the tongue is due to the thickness of the mucous membrane, marked antagonism of striated muscles to bacterial invasions, constant flow of saliva and continual movement of the organ. The infection is chiefly brought about by direct inoculation from the sputum. Other modes of infection are the blood and lymph streams. Of the several manifestations of tuberculosis in the tongue the commonest

is the ulcer which is situated on the side, tip and dorsum in that order of frequency. The ulcer is usually small and rarely attains the size of a 20 cent piece. It is superficial and is lined by yellowish granulations. The edges are not undermined, and, unless secondary infection is present, there is little induration around the ulcerated part. It is characterised by exquisite pain and tenderness but microscopic examination is essential to a definite diagnosis. Ulcers which have to be excluded from this condition are traumatic, syphilitic and neoplastic.

Anthrax Infection and Anthrax Immunisation in Rabbits and Guineapigs

By L. Balteano (Ann. de l'Institut, Pasteur, 1922, T. xxxvi., p. 805.)

The work was undertaken with a view to determine to what extent guinea pigs and rabbits are susceptible to anthrax infection and in what ways the disease can be conveyed to them. The author finds that, contrary to general opinion, guinea pigs and rabbits are in reality refractory to anthrax infection by all routes except that of the skin. If the skin is not touched, virulent anthrax bacilli may be injected into any part of the body with impunity. Infections of the organism by various paths, such as intraperitoneal, intracardial, subcutaneous, intravenous, and intrapleural, have been practised and in all cases the animal remained free of the infection. Furthermore immunisation of the animals against the disease may be obtained by judicial inoculation of the organism into the skin, a result which confirms the observation previously made by Besredka.

A New Method of Testing Liver Functions with Phenoltetrachlorphthalein.

By Sanford M. Rosenthal (Journ. Amer. Med. Ass. December 23rd, 1922, p. 215.)

Phenoltetrachlorphthalein was first demonstrated by Abel and Rowntree to be entirely excreted by the liver. Striking degrees of retention of the dye in the blood were found to exist when the liver was damaged experimentally by chloroform and phosphorus, and in cases of jaundice and toxaemia. After convalescence was established curves of disappearance approaching normal was obtained. The principle of the method is to inject five mgm. of phenoltetrachlorphthalein per kilogram (2.2 pounds) of body weight intravenously. This dosage is normally removed from the blood stream very rapidly: in normal human beings from 2-6 per cent. is present in the plasma 15 minutes after injection, and practically complete disappearance takes place within 40-60 minutes. In cases of liver disease, high percentages may be found in the plasma for many hours after injection. The result are quantitative and believed to give an index of the fundamental functional capacity of the liver.

Bacteriology of Influenza.

Prior to the last pandemic of influenza, it was generally regarded, though absolute proof was wanting, that the Pfeiffer's bacillus was the causal agent of the disease. But the great variability in both morphological and biological characteristics of this organism is so striking that it is difficult to accept the belief that it can be the cause of an epidemic disease whose manisfestations as observed in the various outbreaks are so uniform and constant. It was perhaps for this reason that Nicolle, in 1918, put forward his opinion that a filter-passer may after all be the true cause of the disease. Such a conception seemed to have derived support from the researches of Gibson, Bowman, and Connor but their investigations were left uncompleted by the unfortunate death of Gibson from influenza. Shortly afterwards, the work of Rose Bradford, Basford and Wilson appeared, in which they claimed to have cultivated a filtrable organism from a number of diseases, influenza amongst them. Their claim, however, was not substantiated, for their cultures said to contain filter-passing, living organisms were shown by Arkwright to be grossly contaminated with ordinary pyogenic organisms. Thus the researches of Olitsky and Gates into the bacteriology of influenza, which were published recently again bring into prominence the filtrable-virus theory, and seems to afford strong evidence in support of their findings. In 1918-1919 these authors demonstrated a filter-passer during the first few hours of attack of the disease, and showed that the intratracheal injection of the filtered secretions produced typical influenza like lesions in the blood and lungs of rabbits. A fresh outbreak in 1922 in New York enabled them to continue their investigations of filter-passers which they recorded as being present in the nasopharynx of influenza patients. The organism which they claimed to be the cause of influenza and which they have named Bacterium pneumosintes is a minute coccobacillary body, measuring .15-.3u. in it long axis. It is Gram-Negative but stained with some difficulty with the usual basic dyes. In culture grown anaerobically in a modified Noguchi's medium, consisting of sterile human ascitic fluid and a fragment of fresh rabbit's kidney, the organism usually appears solitary, but may often be found in diplo form and occasionally in short chains. The culture shows a faint haziness in the region of the kidney fragment which gradually extends to a depth of about 3cm., by the 8th day and in the course of 2 weeks settled to the bottom of the tube, leaving a clear faintly opalescent supernatant fluid.

On intratracheal injection into rabbits the organism is found to favour the invasion and infection of the lungs with other bacteria, such as Pneumococcus, streptococcus and B. Pfeifferi, and leads to the development in the experimented animal of a specific immunity against re-infection with similar material, attended with the production of antibodies which can be recognised by precipitation and complement fixation.

Though complete proof of the relationship of the lesions and immunisation reaction developed in the inoculated rabbit to those found in the human subject is still wanting, we can, however,

conclude from the published work of the Rockefeller investigators that all the Koch's postulates have been practically fulfilled and that it seems very probable that the discovery of the germ of influenza has at last been made.

C. Y. WANG, M.D.

1.—Nicolle: Academie des Sciences, Paris, 1918, October.

2.—Gibson, Bowman and Connor: Brit. Med. Journ., 1919, vol. 1 p. 331; 1918, vol. 11, p. 645.

3.—Bradford, Basford, and Wilson: Brit. Med. Journ., 1919, vol. 1, p. 127; Quart. Journ. of Med., 1918, October, and 1919, Jan., Nos. 45 and 46 vol. xii.

4.—Arkwright, Brit. Med. Journ., 1919, vol. ii., p. 233.

5.—Olitsky and Gates. Journ. of Exper. Med., 1922, vol. xxxvi., p. 501, 1921, vol. xxxiii., pp. 125 and 361.

EDITORIAL.

DR. SUN YAT SEN.

An idealistic student of Hongkong University, a revolutionist with a prize on his head in the Manchu Regime, the first President of China, a figure appearing at one time, and fading at another in the political arena of Southern China. These were the kaleidoscopic changes in the life of Dr. Sun, the hope and darling of China. To the educated Chinese he is the father of the Chinese Republic. In the eyes of the medical students of this university, he is more than a patriot for he was a medical graduate of the Hongkong College of Medicine from which our own faculty originated in 1912. One of his teachers has written of him (Dr. Cantlie). "The secret of his success is unselfishness—seeking only his country's good, not his own advancement; a patriot indeed with no axe to grind, no place seeker, willing to rule if called upon, ready and anxious to stand aside when the interests of his country are to be benefited thereby."

But our aim is not to talk about his political achievements. We merely take opportunity to express our pleasure in hearing his inspiring address on his recent visit to our university.

It has been said of Dr. Sun that he knows no failures. His perseverance and tenacity in all matters have commanded the admiration and respect of people from all lands. In the course of his recent speech, he told us of how the corrupt condition of China had prompted him to abandon the art of curing man to that of curing China. We would enjoin on students not to take what he said seriously to heart. The art of curing man is just as important as that of curing political ills. Dr. Sun has forsaken the former and taken on the latter; but, then he is Dr. Sun.

To the medical man China is dead to rational science and alive to funerals. Countless numbers die from diseases which are preventable.

The sanitary improvements that must be instituted in every Chinese village and city, and the medical knowledge that must be propagated for a healthier Chinese race, all demand the unselfish enthusiasm of this and future generations of the medical sons of China.

We have no doubt that Dr. Sun is striving his utmost to bring order out of chaos. We are proud to own him as a member of our faculty, but let us not forget that we too have a duty to fulfil. It rests with us to do all in our power to eradicate the epidemics that periodically afflict the people and to bring about a revolution in sanitary conditons through the propagation of the gospel of science among a mass of people steeped in ignorance.

In decent communities a householder is protected by the law of nuisances from any fouling of his premises by his neighbour. What protection is there against the menace of China to the world in the matter of health. If only in the interests of our neighbours it is up to us to display some of Dr. Sun's energy in the matter of public health.

The China Medical Missionary Association.

We hear that the Hongkong branch of the British Medical Association has extended an invitation to the C.M.M.A. to hold its next meeting in Hongkong in 1925. The University authorities have approved of the use of the University for the purpose of holding the scientific meetings. We feel that our heartiest thanks are due to those whose forethought brought about the invitation.

In 1924 we believe that the British Association is to meet in Toronto. Last year an important meeting of almost international importance was held in Peking. The British Association frequently meets in various parts of the world to the stimulation of the scientists in those places. We would suggest that this combined meeting could be extended so as to make the university redound with credit.

Since the Rockefeller Foundation saw fit to send some of the most prominent scientists to Peking, why should we not make every effort to obtain the visit of prominent scientific men from England? And thus give a stimulus to medical advancement in South China.

The Cost of Medical Education.

In our last issue we drew attention to the changes which have taken place, or which are contemplated in the medical curriculum in various parts of the world.

The only consideration, which is taken into account in suggesting changes in the medical curriculum, is the welfare of the patient. If knowledge has increased and cannot be taught in the time allotted that time must be extended. How about the cost? Let it be made quite clear at once that the student does not pay it. We hear far too much about the tax on parents, etc. In England parents most frequently put their sons into medicine in order that a definite living may be assured and to guarantee respectability. Since they get 300 per cent. more than they pay for it must appear obvious that the public has the right to demand efficiency in treating the sick. For this right of demand they pay their share towards the cost of medical education. The endowment of a university by the government is this expression of the obligation of the public towards providing the cost of educating the medical profession. In China the need for an efficient medical service is patent to all; and it is also perfectly obvious that this work can only be efficiently and completely carried out by the Chinese themselves. To efficiently deal with the problems of public health and preventative medicine requires the intelligent co-operation of the whole people and this can only be given by those who are cognisant of the language.

Included in the total cost of the education of the medical men for China is to the necessary expenditure on efficient teaching. One is appalled to think of what the cost will be when Young China becomes alive to the responsibilities of education. To equip a medical school in anything like a decent manner is a matter which apparently is not appreciated by the public generally.

Taking the smallest item, the salaries of the teaching staff; in a recent census taken in America to determine what is the minimum on which a professor could live and fulfil his obligations to the community, it was found to be from six to eight thousand gold dollars. For the preliminary subjects in medicine this sum works out at about 50,000 gold dollars exclusive of any demonstrator or other staff. Another item—books—without which science is to all intents and purposes blind; to equip a medical library with bare essentials at the present time would cost at least $100,000 and to this must be added a yearly expenditure, on current journals and books, of at least $10,000.

When China starts to build universities, it will not be sufficient to depend on some individual to put up a building and leave the rest to starve or go bankrupt; for by so doing a great injustice will be done to the servants of the institution.

One great scientist in America is reputed to have stated that it is an error to pay scientific men decent salaries because they have their minds detracted from research. If such is the case we have at hand one of the readiest methods of economy in a university, and undoubtedly it has been the means by which many universities have been able to exist in some countries: it is a little hard on the widows though.

How then is China to finance this cost of medical education? Where is the money to come from, for the time is not far distant when outside aid will get tired of dispensing charity to an unappreciative people. Let China spend as much on medical education as she does on funerals and the problem is solved.

DR. FREELAND BARBOUR, AND OUR GREETINGS TO THE EDINBURGH CHINESE STUDENTS.

The senior medical students had the unique opportunity of hearing an informal address by Dr. Barbour, M.A., M.D., F.R.C.P. (Edin.) and a teacher of Dr. C. Forsyth, when he passed through the colony at the end of March on his world tour. He gave an interesting picture of his student days at Edinburgh under Huxley, Lister, and Simpson.

One anecdote of Huxley was particularly amusing and showed that the students of this age were full of the spirit of youth; Huxley was giving a lecture on evolution to his class:—Those at the back rows were fast asleep and snoring lustily; those in the middle rows were either hotly debating some popular topic or were half dozing; whilst those at the front rows were listening attentively to his discourse. Such a state of affairs existed because Dr. Huxley had a very small voice and the students could get a much better account of it in the next day's newspapers! Dr. Barbour ended his talk by drawing an inspiring analogy.

"You know very well what are coral reefs or islands. They are very abundant in the Pacific. These islands consist of millions of dead and living polyps—the dead ones in the centre, and the living ones at the periphery. The living ones in turn die and leave their shells behind and this is repeated through the ages until the island is as we know it. The same is the case in the sea of science. You and I are the living coral polyps, while men like Huxley and Lister are the dead ones who have laid down the foundation of this scientific island; and we must keep on building so that this island may become larger and more majestic."

With him also came a message from the Edinburgh Chinese students to the medical students of this university. We desire to express our thanks through these columns to our oversea cousins and return our best wishes.

NEWS AND COMMENTS.

Visit to Canton Hospitals.

During the past Christmas Vacation, the University football, tennis and basket ball teams, made their annual trip to Canton, and the medical members of the teams, some 15 in number, availed themselves of the opportunity to visit the various hospitals.

At the Canton Hospital, we were cordially received by Dr. Thompson (senior) and the famous collection of bladder stones was shown us.

Undoubtedly Kung Yee Hospital must rank an easy first as a college hospital in Southern China. They have an efficient X-Ray room, with up-to-date equipment. The operating theatre, however, needs slight improvement. They always have wonderful clinical material which is essential for the adequate training of medical students. Some 200 yards to the right of the hospital, a separate building contains the students' dormitories and lecture rooms. Writing about Kung Yee Hospital brings back a painful memory to one's mind. We have pleaded time and again for a University Hospital with an attached hostel and so far the authorities have not seen their way to such a desirable improvement.

The last hospital we called at was the Hackett Medical College for women. As an institution for women, it plays an important part in their medical education, but as we are in danger of growing effusive on such an attractive subject, we will end here.

Prosectors.

Good and careful prosecting has made Anatomy an exact Science. The many beautiful diagrams found in text-books on Anatomy and the fine specimens that adorn the shelves of anatomical museums are examples of the good work of prosectors.

Prof. Shellshear our Professor of Anatomy is of the opinion that prosecting is indispensable to a student of Anatomy. It gives him a more exact knowledge of his work and makes him a better surgeon in his after-life. To materialise his view he is selecting four of the best dissectors among the 2nd and 3rd year medical students to do special prosection. Prosectors for the session 1922-1923 are Messrs. C. S. Oo, S. C. Kwong, T. Z. Bau and K. C. Yeo. We hope that these students who have been honoured with the work will make the post worth striving for among our junior medical students.

"Surgical Shock."

Junior medical undergraduates should be grateful for the knowledge they gleaned out of the beautiful original sketch staged

by Lugard Hall in their annual concert, which depicted vividly the hospital work that is in store for them after their 2nd M.B., B.S. Examination.

"Surgical Shock," the name of the sketch, supplied more information to the "green" ward-clerks, fresh from the dissecting theatre and physiology laboratories, the type of work and the ordeals they have to face than the "red book" furnish them.

Graduate News.

Dr. Yong Loo Lin, who graduated in December, and Dr. S. W. Phoon our First Rockefeller Scholar, have sailed for England to do post graduate work. We wish them every success in their work and hope they will return to us with high honours and degrees behind their names.

We were glad to have Dr. H. S. Yeoh again in our midst. Dr. Yeoh graduated two years ago and was for some time our clinical assistant and research scholar. He came here from the Malay States on a pleasure trip and incidentally to give the Society an account of the work he did in the State of Pahang. His paper on "Fighting Framboesia in Malaya" which will be found on other pages of this issue showed us that he has been very busy in his evangelistic work of curing the native of yaws. We assure Dr. Yeoh that he has our gratitude for the interest he fostered for the Society in coming back to give us an account of his work, and the part he played in carrying the fame of his Alma Mater to the very heart of the Malay States.

Personal.

Dr. Grant, director of the Rockefeller Board of Public Health in China, delivered a short lecture of Public Health in one of the meetings of the Society during the past term. He commenced by saying that since his association with Dr. C. E. Lim, one of our most noted graduates, now researching in Peking Union Medical College, he has always had a high opinion of the University of Hongkong His lecture on Public Health, though short was well treated and interesting. He laid emphasis on the fact that the field of public health work in China lies mainly on the education of hygiene among school children, prophylactic propaganda among adults being not so far reaching in its result.

We congratulate Dr. Earle on his recent election as a member of the Research Committee of the China Medical Missionary Association. We may note in this connection that Dr. Earle is researching on the standard of the basal metabolic rate of the Chinese as compared with the European and American standards. We are expecting accounts of his work in the future issues of the Caduceus.

We regret that Dr. Marriot, our Pharmacology lecturer and a member of our society, has retired from public life in this Colony after an extensive practice of over 20 years. His post as Pharmacology lecturer has since been filled by Dr. Morrison, a prominent practitioner of this colony.

Dr. Forsyth, another member of the staff, lecturer in midwifery has gone abroad on leave. We hope that his health will be much benefitted by his trip. Dr. McGowen is his able substitute. We extend our warmest congratulations to Dr. Li Si Fan, a member of our Society, for having joined the ranks of the Benedicts. We wish him a happy matrimonial life. Dr. Li is holding the office of Dean in Kung Yee Hospital, Canton.

We learn with much regret of the death of Dr. Black's Son, The society extends its deepest sympathy to Dr. and Mrs. Black.

Acknowledgments.

We beg to acknowledge with apologies for inadvertent omissions of the following contemporaries:—

St. Mary's Hospital Gazette.

The Medico.

CORRESPONDENCE.

Mukden,
Manchuria,
3rd, January, 1923.

To the Editor,
The Caduceus.

DEAR SIR,

May I suggest that the Hostel which is to be erected in close proximity to the Hospital, for the convenience more especially of the senior students of the Faculty of Medicine, should be known as the Manson Hall.

The late Sir Patrick Manson originated in 1887 the Hongkong College of Medicine which became absorbed in 1912 in the Faculty of Medicine of our University, and Hongkong is rightly proud of its association with one of the most distinguished pioneers in the field of tropical medical research.

I am, etc.,

Francis Clark.

9TH ANNUAL DINNER.

This annual function of the Society was held at the Hongkong Hotel on April 13th, at 8 p.m., with Professor Shellshear in the Chair.

The official guests were:—

Sir William Brunyate, Colonel Fitzgerald, Surgeon Captain Burmiston, Mr. G. R. Sayer, Mr. R. H. Kotewall, Mr. H. B. L. Dowbiggin, Dr. W. B. A. Moore, Dr. Jeu Hawk, Prof. Roffey, Prof. Hinton, Mr. Ed. Ho Tung, Mr. Yeoh Teik Ye and Mr. Fan Tse Pu.

Indisposition prevented Prof. Wang, our President and Mr. Ho Kwong from attending.

There were over 60 members and friends of the Society present.

After the customary toasts of the King and the President had been honoured, the Hon. Secretary, Mr. S. N. Chau, proposed the health of our guests, specially mentioning the Vice-Chancellor, who honoured us by his presence this year.

Mr. G. R. Sayer briefly replied on behalf of the guests. In the course of his speech, he impressed on the student members that the sense of public service and self sacrifice as possessed by model practitioners was well worth copying and he concluded by saying that the sanitary department would always be in full sympathy with the aims and ideals of the Society.

The Vice-Chancellor then proposed the toast of the Medical Society coupling with it the name of the Chairman. He regretted he was unable to be present last year, but was consoled in having a most eloquent substitute in the person of the Registrar. The Medical Society, he said, is always worth talking about, as it is the only Society of the University which has the co-operation and help of outside members, all of whom are prominent Medical practitioners of the Colony. He congratulated the Society on its flourishing condition and in having Professor Wang as President. The absence of Prof. Wang, Dr. Marriot and Dr. Forsyth was rather unfortunate. He then referred to the "Caduceus" which, as a Medical journal, is so successful that there is an offer for amalgamation, which he hoped, we would resist. In conclusion he drew our attention to the enviable position of the Society specially mentioning the Rockefeller benefaction and the good reception of Prof. Digby, our Rockefeller Professor of Surgery, as a guest of the Institute during his visit to the various Surgical Clinics in America.

Professor Shellshear replied, thanking the Vice-Chancellor for all the kind words he had said about the Society. He then spoke of the good beginning the Medical Society had, in that it was started by Sir Patrick Manson to whom the University also owed its existence. The Society, he said, is essentially the Students' Society and he hoped to see the time when the management will be entirely in their hands. He then proceeded to deal with the future possibilities of the Society. "Sir Patrick Manson when he started the Society must have had a vision. China's responsibility is a grand one. We stand as sentinels to disseminate the whole of Medical Science to a nation teeming with disease. Such a vision, the Rockefeller foundation also had, when they started their monumental work in Preventive Medicine in China. To be a student member of this Society is the greatest honour a student can have. It is he who has to deal with the public health of the country and by so doing, he is, as Dr. Sun says "curing" the nation. Make the town know the great influence such a Society as ours is capable of exerting and when once this is appreciated by the people, our aims are not far from being fulfilled."

Clinical Appointments.

The following is a list of Clinical appointments (April-June) :—

Surgical Ward Clerks	W. Chow.
	K. K. Yip.
Surgical Dressers	A. Shem.
	S. H. To
Junior Medical Ward Clerks	T. Y. Li.
Senior Medical Ward Clerks	C. C. Cheah.
	S. C. Cheah.
	S. A. M. Sepher.
	H. M. Soo.
Obstetric Clerk	S. K. Lam.
Pathology Clerk	Y. C. Teh.
Anaesthetic Clerks	S. N. Chau.
	C. H. Yeoh.

K. C. Y.