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A few Observation on the Properties of Ivory as a Material for use in Bone Surgery.

Professor Kenelm H. Digby, F.R.C.S.

For many years ivory has been employed at times in the form of pegs or nails to secure fragments of bones in proper position. Sir Rickman Godlee has told us that Lord Lister was accustomed to use ivory nails in the early days of antiseptic surgery. Though physiologically far inferior to autogenous living bone grafts, though weaker than boiled beef bones, and feebler than steel plates, yet in special cases ivory still has a limited application. Dr. McKenny and I have occasionally employed intramedullary tubes and rods of ivory with satisfaction in this clinic. If we agree that ivory has an occasional value in selected cases, it may be worth while to record the following scattered observations on the physiological and physical properties of this substance.

Ivory is the substantia eburnea or dentine of the elephant's upper incisor teeth. It is not the very much harder substantia adamantina or enamel. The ivory possesses regularly disposed canals "proceeding in the arc of a circle and producing by their decussations minute curvilinear lozenge shaped spaces." It is this arrangement which gives the characteristic grain of ivory. In the variety which is harder than usual the grain is less apparent. Some of the ivory used in commerce is fossil ivory from Siberia, or rather the tusks of extinct animals which have been preserved frozen in ice for long periods of time.

Physiological Properties.

It is generally recognised that ivory inserted in bone is slowly absorbed. In order to observe this process ourselves, Professor Earle and I performed the following two experiments:—(Diagram I).

Experiment 1.

On the 13th of December, 1917, a small young rabbit was anaesthetised and with aseptic precautions the right tibia was exposed and its medullary cavity opened near the upper end of the shaft. Two exactly similar ivory rods of such size as to completely fill the medullary cavities of the tibias of a rabbit of corresponding size had previously been prepared. One of these (Fig. I.A.) was kept for comparison, the other was inserted into the medullary cavity and the wound closed. On the 20th January, 1918, (thirty-eight days after) the rabbit was killed. There was no enlargement of the tibia. The ivory rod inside was adherent to the bone except at its lower end which lay free in the red marrow towards the distal extremity of the bone. When separated from the bone, the part which had been in contact was rough and pitted. The free end, however, was smooth. The ivory rod as a whole (Fig. I.B.) was only just preceptibly smaller than the control.

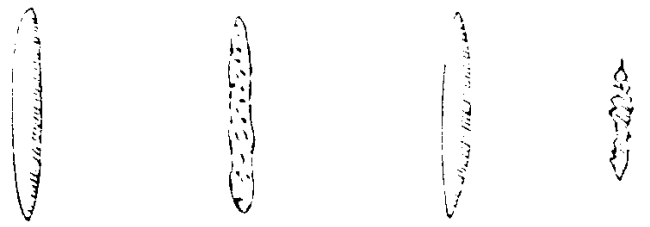
Experiment 2.

On the 13th December, 1917, a second small young rabbit was similarly treated. In this case the ivory rods were somewhat larger so that the one inserted into the tibia (the left tibia in this case) split the bone longitudinally. On the 29th of May, 1918 (one hundred and sixty-seven days or nearly six lunar months later) the rabbit was killed. By this time it had grown to a large size. The left tibia was of the same shape and thickness as the right, but the medullary cavity was found to be somewhat blocked, a probe which easily traversed the right tibia not passing along the left. The shaft was now split so as to expose the interior and the remains of the ivory rod were seen adherent to one side of the medullary cavity about the middle of its length. The ivory rod (Fig. I.C.) was porous and worm-eaten in appearance and thinned to one third of its size as judged by the control (Fig. I.D.).

These experiments illustrate the slow absorption of ivory rods in the medullary cavities of bones. They also show the capacity of the living bone to become adherent to the ivory. Had the ivory been in the outer part of the shaft rather than in the medullary cavity, it would probably have been replaced by osseous tissue, instead of only being absorbed. The non-irritability

of the ivory was also illustrated together with the fact that a long bone can tolerate a large ivory rod completely filling the medullary cavity of the shaft without interfering either with its shape or its growth.

Figure I.



Physical Properties.

Effects of Boiling. We have had many opportunities of testing whether ivory is weakened by boiling, and have observed that it can be boiled for two or three hours without deterioration but if boiled frequently and kept for long periods it becomes fibrillated and brittle.

Degree of Softness. Notwithstanding its strength, ivory is soft enough even to be cut with a strong, sharp knife as well as with a saw. It can without any difficulty be turned in a simple lathe, holes can be readily made in it with a drill and surfaces can be easily smoothed and shaped with sand-paper and file. The surgeon can thus in some measure become independent of the surgical instrument manufacturer. And the tube or rod can be accurately and quickly modified to suit the requirements of any individual case.

Density. Professor A. G. Warren (when Professor of Physics at this University) kindly examined samples of bone and ivory and supplied the following report. The sample of bone was removed from the compact tissue of the middle of the shaft of the human femur.

"The outstanding features are:—

1. The large moisture content, especially in the case of ivory, of specimens which have been exposed to the atmosphere; that is to say exposed specimens are almost wet. (This was during the damp season in Hongkong).

2. The considerable increase in mass that takes place upon soaking a dry specimen, which is accompanied by

3. A considerable, and nearly equal (especially in the case of bone) increase in the volume.

4. In consequence of (2) and (3) the density depends very little upon whether the specimen is wet or dry. It is slightly greater for wet specimens.

The specimens were dried by heating for 12 hours at 99°C. They were afterwards waterlogged by boiling for 8 hours and being left immersed in water for 16 hours longer.

The results are given in the following table:—

Table 1.

Weight as supplied	gms.	3.3178	2.4362
Weight dry	gms.	3.0470	2.1004
Weight wet	gms.	3.4176	2.4724
Volume dry	cc.	1.5335	1.2205
Volume wet	cc.	1.7737	1.4185
Density dry		1.924	1.721
Density wet		1.927	1.743
Increase in weight on wetting	%	12.16	17.71
Increase in volume on wetting	%	12.01	16.06
Moisture content as supplied weight	%	8.89	15.99

Measured in terms of dry weight and volume.

The results are accurate certainly to 1 part in 2,000 and probably to 1 part in 5,000."

It will be seen that the density of ivory 1.743 is slightly less than that of the denser compact human osseous tissue 1.927. The specific gravity for steels varies from 7.82 to 7.92, and, being so dense, their mere weight tends to produce irritation in the surrounding tissues especially during movements of the part. Ivory lies more quietly in the tissues to which it closely approximates in density of structure.

Compressibility and Elasticity. Ivory can be compressed to an appreciable degree and on release of the compressing force resumes its original volume. In consequence, ivory pegs or rods when driven into correspondingly smaller holes even in a rigid substance like bone become fixed with a certain degree of firmness.

Ivory also exhibits a considerable elasticity to a bending force. As the force applied increases the ivory bends, but springs back immediately when no longer acted upon. It only shows a very slight degree of permanent deformation just before the force applied reaches the breaking point.

Ivory in virtue of its elasticity yields temporarily, and is thus able to withstand sudden stresses.

Strength as shown by resistance to bending. The tests recorded below were performed on a tensile testing maching for me by Professor C. A. Middleton Smith, Taikoo Professor of Engineering at this University whose work on the strength of materials is well known. The details of the experiments are tabulated in Figure II but one or two of the results may be commented upon here.

A tube (Fig. II-B) suitable for treating a fracture of the shaft of a large sized humerus had a breaking stress of 84 inch-pounds; a larger tube (Fig. II-C) suitable for a fracture of the shaft of a big femur had a breaking stress of 236 inch-pounds.

A comparison was made between two fractured femurs, one united by ivory tube and pegs (Fig. II-F) the other by a single eight hole steel plate (Fig. II-G & G) of an old kind formerly used for such fractures. Long before a stress of 60 inch-pounds had been reached the steel plate had become permanently bent and the correct alignment of the fragments was destroyed. The plated bone was tested at its weakest, that is the point of loading was upon the plate, not upon the opposite side of the fracture when the plate could not have bent so easily while the screws held The strain was also upon the shortest diameter of the steel plate. The other fractured bone had been united by ivory tube and pegs in a special manner. The ivory tube broke under a stress of 194 inch pounds without having sustained any permanent deformation at lesser stresses. The ivory tube therefore compared favourably with the single eight-hole steel plate. Of course two plates on different surfaces give much greater strength and stouter and stronger steel plates are often used. A comparison was also made between the same fractured femur united first by a tube (and pegs) (Fig. II-F), and then by a solid rod (and pegs) (Fig. II-H). Though the rod was solid it was slightly smaller and yielded at 170 as against 194 inch pounds. This shows that a rod gains little over a tube in the way of strength. The fractured femur with ivory tube and pegs only yielded to a stress of 194 inch pounds. That is, it would require a force of 194 lbs. at a distance of 1 inch, to break it, 97 lbs. at a distance of 2 inches and so on, far more than any likely pull upon the fragment by muscular tone or spasm.

In a patient of average weight and height with a fracture in the middle of the thigh, the ivory referred to above would be able to bear the weight of the outstretched limb beyond.

If the upper fragment were firmly fixed and violence were applied laterally to the heel it would require a force of 6 to 8 lbs. to break the ivory tube, a force against which careful splinting should be able to protect the limb.

Figure II.

A  Ivory rod, diameter=0·207 ins., broke at 34 in.-lbs.

B  Ivory tube, d_1 = 0·344 ins d_2 = 0·139 ins., broke at 84 in.-lbs.

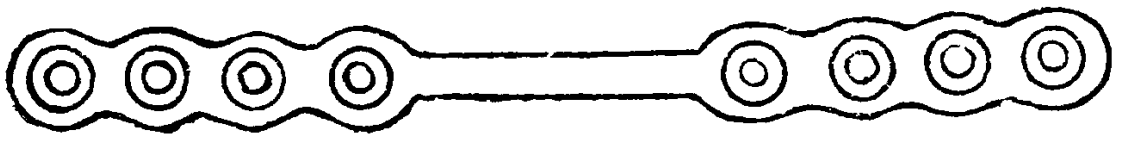
C  Ivory tube, d_1 =0·420 ins. d_2 = 0·193 ins., broke at 236 in.-lbs.

D  Ivory plate, broke at 40 in.-lbs.

E  Ivory plate, broke at 62 in.-lbs.

F  Ivory tube, d_1 = 0·416 ins. d_2 =0·208 ins., broke at 194 in.-lbs.

G Steel plate.



G I Steel plate, in section permanent deflection occurred beyond 60 in.-lbs.

H  Ivory rod, d = 0·377 ins., broke at 170 in.-lb

Professor Brown, Professor of Mathematics at this University has very carefully analysed these figures in Figure II and his calculations appear as follows. These calculations were made on the assumption that the rods and tubes were truly circular and that the material was strictly homogenous. As a matter of fact the rods and tubes, which were made by a local workman with a primitive lathe, were probably not very true. The measurements were those of the end of the rod or tube and may not have been precisely those at the point of fracture. This may account for part of the discrepancy in the results. Nevertheless it is very probable that the strength of different samples of ivory varies considerably.

In the case of rods and tubes such as these:

$$f = \frac{M}{Z}$$

Where f = the maximum tensile or compressive stress in the material.

M = the bending moment

Z = the "modulus" of the section.

With solid rods $Z = \frac{\pi}{32} d^3$ (where d = diameter of a section)

With hollow tubes $Z = \frac{\pi}{32} \frac{(d_1)^4 - (d_2)^4}{d_1}$

(where d_1 and d_2 = the external and internal diameters of a section)

"A" $d = 0{\cdot}207''$ Specimen broke at 34 in-lbs.

Here $Z = \frac{\pi}{32} (0{\cdot}207)^3 = 0{\cdot}00087 \text{ in}^3$

$\therefore \quad f = \frac{34 \text{ (in. lbs)}}{0{\cdot}00087 \text{ (in)}^3} = 39,100 \text{ lbs./in}^2$

"B" $d_1 = 0{\cdot}344''$ $d_2 = 0{\cdot}139''$

Specimen broke at 84 in-lbs.

Here $Z = \frac{\pi}{32} \frac{(0{\cdot}344)^4 - (0{\cdot}139)^4}{0{\cdot}344} = 0{\cdot}0039 \text{ in}^3$

therefore $f = \frac{84 \text{ (in-lbs)}}{0{\cdot}0039 \text{ (in}^3\text{)}} = 21,600 \text{ lbs/in}^2$

"C" $d_1 = 0{\cdot}420''$ $d_2 = 0{\cdot}193''$

Specimen broke at 236 in-lbs

Here $Z = \frac{\pi}{32} \frac{(0{\cdot}42)^4 - (0{\cdot}193)^4}{0{\cdot}42} = 0{\cdot}00691 \text{ in}^3$

therefore $f = \frac{236 \text{ in-lbs}}{0{\cdot}00691 \text{ in}^3} = 34,100 \text{ lb/in}^2$

"F" $d_1 = 0{\cdot}416''$ $d_2 = 0{\cdot}208''$

Specimen broke at 194 in lbs.

Here $Z = \frac{\pi}{32} \frac{(0{\cdot}416)^4 - (0{\cdot}208)^4}{0{\cdot}416}$

$= 0{\cdot}00661 \text{ in}^3$

$$\therefore f = \frac{194 \text{ in. lbs.}}{0{\cdot}09661 \text{ in}^3} = 29{,}300 \text{ lb/in}^2$$

"**H**" Here $Z = \frac{\pi}{32} D^3 = \frac{\pi}{32} (0{\cdot}377)^3 = \frac{\pi}{32} \times 0{\cdot}0535$

$$= 0{\cdot}00524 \text{ (ins)}^3$$

$$\therefore f = \frac{M}{Z} = \frac{170. \text{ (in-lbs)}}{0{\cdot}00524 \text{ (in}^3\text{)}} = 32{,}500 \text{ lbs/in}^2$$

The average for the five specimens of ivory, therefor, is:—

$$f = 31{,}000 \text{ lbs/in}^2$$

The breaking-strength of steel or woods is a very variable quantity for soft woods, f = 1 to 3 tons/in^2

or (roughly) = 2,000 to 7,000 lbs/in^2

for good oak, f = 4 to 6 tons/in^2

or (roughly) = 9,000 lbs/in^2 to 13,000 lbs/in^2

For steel, the value of "f" varies between such wide limits as 20 tons/in^2 and 100 tons/in^2

or 45,000 lbs/in^2 and 225,000 lbs/in^2

(Steel drawn-wire, as for pianos, may have a strength of 150 tons/in^2)

The ivory is thus stronger than most woods, and inferior to even the poorest kinds of steel. It is comparable however with copper or gun-metal.

The strength of some of the human long bones (adult Chinese males) as measured by the breaking stress reached by *gradual* increments of bending force is shown in the following table for comparison with ivory. I am again indebted to Professor A. C. Middleton Smith for conducting these tests.

Femur A middle of shaft broke at	..3240 in/lbs
Femur B middle of shaft broke at	..1910 in/lbs
Thigh of cadaver C (middle) broke at ..	..3808 in/lbs
Leg of cadaver D (middle) broke at ..	..2722 in/lbs
Arm of cadaver E (middle) broke at ..	.. 923 in/lbs
Forearm of ,, F (middle) broke at ..	.. 698 in/lbs
Dried Tibia G (middle of shaft) broke at	..1331 in/lbs
Dried Fibula H (lower end) broke at ..	.. 26 in/lbs

These figures illustrate the strength of the bones, but they are no direct measure of the force involved in accidental fractures during life, as the violence in these cases is very rarely a slowly-applied bending force.

A Suggestion for the Treatment of Early Phthisis by Upper Intercostal Nerve Block.

By Professor Kenelm H. Digby, F.R.C.S.

The most important part in the treatment of tuberculous disease in joints or elsewhere in the human body is rest and immobilisation. There is no other one therapeutic measure which can be so confidently relied upon.

In the case of the lungs this fixation is difficult to secure. Ultimately, but, alas, for the most part too late, the natural reactions of the body secure it by cicatrisation of the pulmonary tissue, pleural adhesions, falling in of the ribs and wasting of the respiratory muscles.

Certain artificial means have been attempted to secure rest. The affected part of the chest has been confined by adhesive strapping. The phrenic nerve has been divided or blocked with alcohol, but this rests the base of the lung not the apex and is therefore unsuitable for the usual type of case. Artificial pneumothorax has frequently been employed and often with benefit. It certainly secures complete rest, but the whole lung is thrown out of action, secretions cannot be expelled, the mediastinum tends to be displaced, the lung circulation is interfered with, and the actual production of the pneumothorax is not devoid of danger (1). The various forms of thoracoplasty produce rest but are severe operations for sick people. This preliminary note suggests the blocking of the upper six intercostal nerves on the affected side in an early case of apical phthisis. The idea occurred to the writer many years ago when reading an article by Professor Keith (2) on the fan-like expansion of the lungs. It is probable that upper intercostal nerve block for phthisis has been adopted by others, but I have not seen any reference to it, nor does Dr. R. A. Young in a lecture (1) on "methods of securing local rest for the lung" delivered on 17th March, 1924, mention such a method.

Professor Keith pointed out that the lung does not expand uniformly as a whole, but rather in a fan-like manner. If we expand the upper part of the thorax the apices of the lungs expand, if we employ the diaphragm the bases are distended and the apices move little if at all. It follows that if the upper intercostal muscles cease action, the upper part of the lung is at perfect rest during quiet inspiration. The extraordinary muscles of inspiration viz. the scalenes, pectorals, etc. would still lead to movement at the apices, but their action can be largely cut out, by sedative cough mixtures and abstinence from exercise.

(1) "*Lancet*" CCVI *p.* 581. (2) *Further Advances in Physiology p.* 202.

The upper six intercostal nerves could be cut at an open operation, but owing to the muscles passing from the spine to the scapula the nerves are deeply seated and the operation would be unduly severe in a consumptive patient.

The upper six intercostal nerves can however be thrown out of action for a few months safely and simply by injecting alcohol into or beside them. The process can be repeated if necessary. No general anaesthetic is required, no danger can be apprehended. If a little alcohol accidentally entered the pleura any resulting pleural adhesions would be beneficial.

The following technique of injection is suggested. It has been worked out on the cadaver by injecting ink and then dissecting to see whether the nerves are fully stained with the ink.

A preliminary injection of morphine and scopolamine is given.

The upper six thoracic spines are identified thus. When the head is thrown backwards (that is when the cervical spine is freely extended) the uppermost, prominent, easily identified spine is that of the 7th. cervical vertebra. Below this the upper six thoracic spines can be easily felt.

The patient should lie on the opposite side to that which is to be injected. The back should be slightly bent so that the chin approaches the chest. This opens out the intercostal spaces behind to a slight degree.

The followning solution (after Schlosser) is used for injection:—

B. Eucaine (or Novocaine)	1 part.
Aq. Dest.	19 parts.
Absolute Alcohol	80 parts.

to be kept in a sterilised glass-stoppered bottle.

1 c.c. of this solution may be injected into each intercostal space.

The needle of the syringe is inserted at points about 1¼ to 1½ inches lateral to each of the six thoracic spines in the adult. In the case of the upper injections the needle should incline medialwards. In the case of the lower injections the needle should point a little in a lateral direction.

As there are considerable variations in different chests it is preferable to place the patient in the position for injection before the X-rays and under screen examination to mark on the skin the position of the spines of the upper six thoracic vertebrae and the tubercles of the upper six ribs. The X-ray tube should be

moved slightly so as to lie directly opposite the vertebra and rib of which the surface markings are being recorded. The needle is inserted opposite the tubercle of the rib.

The needle is pushed on till bone is encountered. This is about the tubercle of the rib close to its articulation with the tip of the transverse process. The depth is noted the index finger being placed on the needle 1 cm. beyond the point of entry in the skin. The point is slightly withdrawn and worked downwards till a space is found and then pushed on till the guarding finger reaches the skin when the injection is made.

If all the injections are successful the upper part of the chest should not move during quiet respiration, and there should be numbness and anaesthesia along a narrow strip of the medial side of the arm and the (second), third fourth, fifth and sixth intercostal spaces. It will be remembered that the skin over the upper one or two intercostal spaces is supplied by descending supraclavicular branches of the cervical plexus and will not therefore be anæsthetic.

The method would appear to involve practically no danger and could hardly fail to be of great value in selected cases. This preliminary, perhaps premature, note is published in the hope of attracting suitable cases and of finding references to previous attempts of this nature.

Anthropology.

Professor Joseph L. Shellshear. D.S.O., M.B., Ch.M.

When I was invited to contribute to this number of Caduceus, I felt that it would be of value to write on the general subject of anthropology with particular reference to the very large field of subjects for investigation lying at our own doors.

I have just read in *Nature* an article by Osborn on the Asiatic Expeditions of the American Museum of Natural History in which he says that "under the very active leadership of Mr. Andrews a new scientific and financial campaign, begun in November, 1923, carried on in the chief cities of the United States, has resulted in a flow of contributions for the continuation of the expedition over a new five-year period beginning in 1924. The sum of 254,000 dollars has all been contributed, and subscriptions are coming from 235 individuals in twenty-five states."

The vast amount which has been added to our knowledge by the enthusiastic band of the Natural History Museum of New York cannot be over estimated; and. if a member of this University should appear to be breaking the tenth commandment in coveting just a little of the financial support which is given to these expeditions, it is only natural since there exists on this island of Hongkong an abundance of material which will require a large body of research workers if full use is to made of it. I feel that an opportunity may slip by before we come to a realisation that the anthropological and pathological materials of this storehouse are being daily wasted.

What I want to write to you about in this University concerns every student and everyone who has any interest in preventive medicine and pathology.

The investigation of this material is definitely the function of our University. For this reason it appears to me to be very desirable to pause and enquire as to what is the function of a university.

The aim of a university is to acquire and to impart knowledge. I have put to acquire before to impart. Can one conceive the state of argument which would have ensued if the founders of this University had insisted that no student should enter it for the first fifteen years of its life; and yet I cannot help feeling that, if no hostels had been built and if all the available money had been expended in establishing fundamental chairs and in fully equipping the departments, so sure would have been our foundation that students could have then entered with a full realisation that their teaching is only a subordinate part of a university's life. The average man cannot conceive a university without students and yet such an institution might become famous for the knowledge which it might be the means of disseminating.

I do not intend to touch on the great fields which lie open to the biologist and the pathologist. I wish to draw attention to the field of anthropology, to touch on the problems for investigation and the methods which are in use in that field.

Anthropology is particularly concerned with the question of the biological history of man. It deals with his origin, his distribution, his physical characters and differences, and finally with the causes underlying the differences between races.

The scope of anthropology is therefore unlimited. No matter into which department of science we enter we find material which will help to reveal the story of man.

The origin of man opens up the whole of the problems of evolution; it takes us back to the beginning of things and then we find ourselves involved in the question of eternity, of infinite time and of infinite space. Man passes beyond the limits of

his intellectual capacity and postulates in abstract terms. To many the final answer is given in the knowledge of Him who created all things; anthropology leads to the conception of God. To others the cause is found in the use of abstract terms, such as, we are made and have evolved in accordance with the laws of nature. Quite so, but what is meant by nature? Strictly speaking neither of these explanations, although perhaps both correct, come within the realm of science.

Science deals with the origin of man from a definite point of time. It concerns itself with the explanation of observed phenomena. From such observed phenomena of biology, geology, embryology, etc., hypotheses are put forward to account for what has been observed. The number of observed facts regarding the origin of life itself are so limited and so problematical in their interpretation that the theories built up on them can hardly be regarded as science. Nevertheless it is important to appreciate that man is an imaginative animal and entitled to use his imagination. An hypothesis is no less justified because the facts on which it is formed are limited in number. Some of the greatest advances in science are the direct result of hypotheses which are later found to be untenable. The function of an hypothesis is to act as a scaffolding on which facts may be built until definite law is established. An hypothesis gives an explanation of the facts as far as they are known, it becomes superseded by a law when all related facts are capable of explanation by it.

I have enlarged on this point for the reason that we are going to be concerned with a subject on which so few facts are known and on which many hypotheses will have to be put forward before anything in the form of a law will be possible. I refer to the origin of the Chinese race.

It is a mistake to regard the solution of this problem as the work of the anatomist. There is no department of this University which could not include it as a question for research.

The questions for solution can be stated in general terms under three heads.

(1) What constitutes the Chinese race?

(2) Did they arise independently of other races from separate anthropoid stock? If not,

(3) Whence did they arise and when?

Many classifications of races have been made according to various characteristics. These characteristics permit us to arrive at a broad basis for comparison into races such as European, Negroid, Mongolian etc.; but it is the desire of the anthropologist to carry the classification further and to try and find out whether there is such a thing as a unity of type.

Man from the beginning has been an inveterate traveller, every race shows evidence of wanderings far and wide. It is this very wandering which has been overlooked and, when it has been realised, has frequently been employed in trying to prove unity of peoples when only unity of culture and religious custom exist. The first definite rule which is laid down therefore is that similarity of religion and culture do not of necessity imply unity of race. Take an example; it is conceivable that, as a result of a handful of missionaries in China, the Chinese race may accept the doctrines of Christianity in its original, or in a modified, form. In 100 years one may find no Europeans in China; and yet it may be found that Christianity is the current religion. It is not logical to say that the two races must have a common origin, but it is logical to hypothesise that the two races must have come into contact either directly or indirectly. In other words that the cultural characteristics are of common origin. The study of comparative religion and culture has been instrumental in enlarging our knowledge of human types and the paths which man has taken in his wanderings.

When we find therefore that characters of culture are similar we should look for the points of contact.

In this direction we find many clues which may aid us in the past anthropological history of China.

Let us examine a few of these.

I have noticed on many of the graves in the Hongkong district that there is painted on the back wall of the grave the winged solar disc. Sayce tells us that when Amenophis III. entered into matrimonial alliance with the king of Naharina the marriage had strange consequences for Egypt. The new queen brought with her not only a foreign name but a foreign faith as well; she refused to worship Amon of Thebes and the other gods of Egypt, and clung to the religion of her fathers whose supreme object of adoration was the solar disc. The Hittite monuments bear witness to the prevalence of this worship in Northern Syria. The winged solar disc appears above the figure of a king which has been brought from Birejik on the Euphrates to the British museum; and even at Boghaz Koui, far away in Northern Asia Minor, the winged solar disc has been carved by Hittite sculptors upon the rock.

A great amount of research can be made into the burial customs of the Chinese and through these we may be able to formulate some idea of the time of the intermingling of her peoples.

De Groot has written more than any other on the religious systems of China and in his description of the burial mounds we find an exact parallel to the methods of burial in Egypt. One

striking feature of the religious systems of ancient times is their close association with the burial customs. In America and in the Philippines one finds that the bodies were interred in a contracted position in the same way as they were in the near East. Always associated with death was the search after life giving substances and emblems. Elliot Smith has written very extensively on the migrations of culture and has drawn attention to these life giving principles. The colour red has been associated with life giving properties, undoubtedly because the ancients observed that on the loss of the red colour of the blood the animal died. It was hoped that in some way this life principle might reanimate the body if the body were covered with red ochre. In China the colour red is always associated with life giving property and we see in de Groot's book an example of the use of blood which takes us back to the times of Cro-Magnon man. He says p. 216. "The ink used for the dotting must be red, because red is the colour of fire and light and consequently particularly identified by Chinese philosophy with the yang or the chief principle of life. And when the soul has been so much weakened by a long postponement of the burial that a cock is required in the procession to strengthen it, some blood of this bird is taken to moisten the ink, because it contains the vital energy of the very being which is a principal depository of the energy of the yang and the sun, in short, of the life of nature."

These two isolated facts, the presence of the winged solar disc and the colour red, are not sufficient to build up theories of origin; but we have associated with them a great number of customs which are only explicable by a reference to earlier cultures in other places. A few may be mentioned as worthy of investigation, the use of the eye on the bow of the ships, involving a study of the origin of shipping in China, the close association of mountains in religious matters, which closely parallels the Egyptian and Babylonian customs, the pearl and the jade as life giving substances, the potting of the dead before burial and many others.

But the work of the anatomist is more concerned with the structural side of anthropology.

The first great work which must be done in China before any great advance can be made, is the establishment of definite standards, both anatomical and physiological. Anatomy must be rewritten for the Chinese. The structure of the brain is found to differ in many respects from that of the European. The building up of the higher intellectual faculties appears to have been laid on somewhat different sensory foundations. In the brain of the Chinese the visual territory on the occipital lobe is marked by a very prominent and operculated sulcus lunatus. The visual cortex extends from two to three centimetres on to the lateral surface and is exactly bounded by

the posterior lip of the sulcus lunatus in over 50% of the cases which I have examined. This must have a far reaching effect on the formation of the psychological characters of the race. A lot of work must be done in this region and the problem must deal with whether or not there is a separate class amongst the Chinese who have the sulcus in a more primitive state than in the others.

Again further work must be done on the endocrine glands. I wrote in the last number on the thymus. The question must be solved whether this persistent condition is due to accidental factors such as disease or whether it is inherent in the race.

Progress in this field of anatomy can be speeded up if we can get some working plan to co-ordinate the work of this University with other schools in China working on the same lines. What is true for the south may not be true for the north.

Physiology is another branch of anthropology and as you know Professor Earle has been for some time working on the physiological standards in the Chinese with particular reference to the metabolic processes.

So much for normal anatomy and physiology: What of pathology? In this field China may contribute material of the greatest benefit to mankind in general. In the mortuary of Hongkong we find an average of twenty postmortems a day. These are of particular value because they have been in many cases entirely untreated and so we can study the complete series of phenomena associated with disease.

One sees an appalling death rate in infants from tuberculosis and lesions are daily seen which are very uncommon in other parts of the world.

What are the hindrances to the attainment of the knowledge required? In the past poverty has not prevented important discoveries in science, at the same time the progress of knowledge has been seriously hampered by lack of co-ordination between scientific workers and business establishments which have exploited the findings of science. Business has for too long appeared to science as a hard taskmaster waiting at the door to receive the findings, converting them into this world's goods and then forgetting the originators.

If I may say so, the outstanding characteristic of the Chinese student as I have seen him is that he is so keen about his future business prospects that there is no room for thought about the future of his University. He can see nothing in research because there is no money in it. It is not unusual in a British University to find about two per cent. of students with a desire to attain knowledge for its own sake. It is from these students that the scientific staffs of universities are drawn. Is China going to continue to draw upon the west for her teachers in medicine?

The problem awaits your solution; there only remains to be found an unselfishness in this University among its students and work will proceed at a rapidly increasing speed.

* A Practitioner On Board.

By Cheah Toon Lok. M.B., B.S.

Mr. Chairman and Gentlemen,

Being guilty of a promise made sometime ago to your Honorary Secretary, I am glad that circumstances have assisted me here to-day to fulfil that promise.

The subject I have chosen I believe will appeal to those who have been to sea before and who cherish in the recesses of their mind, pleasant memories of moonlight nights on board, of the magic beauty of sunrise and sunset one meets with at sea, of the old tars sitting around the dining saloon, spinning delightful yarns of the old sea-salts and their ships, and of the trials and troubles that beset a practitioner on board. I also believe it will be of interest to those who are thinking of a sea trip, to recover their mental equilibrium, to remove that pathological outlook, fostered by an examination both strenuous and merciless, and to put on a few ounces of adipose tissue, so necessary for the appearance after nights of insomina. To the armchair critic it will also afford grounds for criticism.

A learned professor once classified medical graduates into three types. To the first type belongs the research worker, who is bent on adding something to the accumulated store of human knowledge, to the second the general practitioner, who is bent on adding something to the accumulated store of human wealth, and to third the ordinary ship-surgeon who is bent on taking something away from his accumulated store of medical learning.

Whether the classification is right or wrong, just or unjust, I leave it to you to judge, but it seems to me that a medical man, whether he is a research worker or a mere general medical practitioner or an ordinary ship-surgeon does in his own way his bit for the good of humanity, and, however small that bit may be, it justifies his existence.

In the old days of sailing ships when human knowledge of drugs was small and empirical, hydrotherapy, blood-letting and amputations were in fashion, and the doctor on a ship was called a surgeon because his knowledge of drugs was negligible and to be of service he had to be a very fine barber and a very good

* Read before the Medical Society on May 2nd, 1924.

butcher. But to-day with our increased knowledge of drugs, with our increased knowledge of diseases, with the growth of preventive medicine and a keen public health conscience, quarantine regulations are in force at most ports to limit the spread of infectious diseases, and the doctor on board becomes more of a physician than a surgeon, more of a diagnostician than a prescriber. Therefore to call a ship doctor a surgeon is a misnomer, and I have used the generic term of practitioner in the title to soothe the tender feelings of those who are accused of being surgeons and who have even been classified under the third grade.

In fact the existence of the modern ship doctor is due rather to the Public Health Act of 1875, than to the desire of shipping companies to safe-guard the health of their passengers, though the Merchant Shipping Act of 1894 and 1906 have made the carrying of medicine and antiscorbutics compulsory. The ship doctor then although paid by the shipping company is the creation of a paternal government to protect the health of the public and as a public servant he cannot expect much from the shipping company, who just tolerates his existence.

Whatever may be said, to be a practitioner on board one has to obtain that position from a shipping company. There are many ways of getting the position.

(1) It is offered to you by the shipping company that is hard pressed for a doctor, especially when the ship is due for sailing and there are passengers on board.

(2) You apply to the company for the position.

(3) You are invited to act as a substitute for a trip or two, for another ship doctor, who for good reasons like ill health or marriage would be unable to work for sometime. The consent of the shipping company must be first obtained. This is usually given and you are paid the same salary and, except for the period of service, bound by the same contract. It is usually difficult to find a substitute; the reason is obvious.

When the company agrees to engage you the first thing that is submitted to you is the contract and it is very important that you read the contract carefully.

The preamble usually deals with

(1) Your engagement as a doctor to act on the company's vessel employed in a specified trade route.
(2) The period of contract is for a round trip or for six months or a year.
(3) The salary. The amount and payment at the end each trip or at the end of each month.
(4) The termination of the contract at any place agreed upon.

The salary is usually in dollars, rupees or pounds. If the contract is made in Hongkong it is usually in dollars.

During the war the doctor's salary for a round trip of one to one and half months is from $700 to $900. Now owing to many causes, the salary is from $500 to $700 for a round trip. During the war the contract salary for a period of one year, is from $500 to $800 per mensem, but to-day owing to lack of professional ideals and improverishment in our ranks, ship doctors are willing to accept a salary of $325 to $500 a month and in India especially where things are cheap, doctors are willing to sell their soul for Rs. 180 to 300. Whatever one may comment on this it is certain that not many are maintaining the ideals and traditions of an ancient and noble profession. For myself I would rather honour a man who works for a small remuneration in a hospital than one who works as a ship doctor for less than $400 a month. The other part of the contract is divided into nine clauses.

Clause (1) Deals with the duties of the ship doctor. Attention to the well being of all the passengers and crew.

(2) Extra duties caused by new port regulations to be included in the doctor's work.

(3) Provision for the carriage of doctor's effects. Allowance of $5 per day if the company is unable to provide for board and lodging on board.

(4) Privileges regarding medical treatment for the doctor in hospital in case of sickness.

(5) Provision for renewing the contract on its termination at sea.

(6) The doctor is prohibited from accepting fees from the passengers.

(7) The company has the right to dismiss the doctor on a month's notice or on paying a month's salary, for neglience or breaking clause 6.

(8) The doctor undertakes to leave instruments and drugs in order, on transfer or departure.

(9) The doctor can nominate a substitute to act for him subject to the consent of the company. The substitute is bound by all the conditions of the contract except the term of service.

This is the kind of contract that is usually submitted to and accepted by ship doctors. It is useful to remember that as the contract stands there is no chance for the doctor to terminate his service except through a substitute or to wait for the

expiration of the term. To safe-guard himself in case of emergency, a clause giving the doctor the right to terminate his service by giving a month's notice, is necessary. In some companies the ship doctor is given 10 cents commission for every passenger carried.

After the original contract has been signed, stamped, and put into the company's safe, a duplicate is given to the doctor for future reference.

The next step is to get signed on to the ship. To sign on means to get the doctor's name and ship registered in a special book kept by the Government Mercantile Marine Office. For this purpose the doctor is given a letter of introduction from the company to the Registrar of Shipping. The doctor is required to sign in the register, his name, age, birthplace capacity, ship, salary per mensem, and the date. In case of a private contract between the doctor and the company the pay is put down as one shilling. The salary starts from the day one signs on. Such a procedure is necessary to protect the interest of the sailors in case of a dispute with the company about the date of employment and salary.

After this the doctor is in the service of the company and he is provided with a launch to go on board and examine the medicine chest and make his report.

On board the medicine bottles and instruments are usually in disorder and it takes time to check the drugs and instruments. It is always a safe rule to go through the empty bottles first, because the empty bottles will indicate the favourite drugs of your predecessor. Jars and bottles containing the common ointments and drugs are usually empty. Then go through the other bottles and see whether your favourite drugs are there. Do not trust to memory; write down all the things you have observed. Now go through all the dressings, bandages gauze, lint, cotton wool, adhesive plaster and so on. Then examine the instruments in order, catheters, enema tube, forceps, glycerin syringe, hypodermic syringe and needles, rubber gloves, scalpels, scissors, splints, sutures, surgical needles, torniquet, urethral syringe and so on. Then the other requisites, bed pan, enamel dish, powder knife, measuring glasses, in minims, drachms and ounces, scales and weights for drugs.

After you have examined all these report to the company and apply on a requisition paper, for the drugs, dressings and instruments you require. The requisition paper or indent form is signed by the captain, the company's marine superintendent and the doctor. The company will do the ordering and send the drugs on board. Most medicine chests contain drugs that one seldom uses and it is useful to order common drugs such as

1. Acid Boricum.
2. Aspirin.
3. Aether.
4. Alcohol.
5. Bismuth. Subnit.
6. Calf Lymph.
7. Creosote.
8. Chlorodyne.
9. Carbolic.
10. Calomel.
11. Glycerine.
12. Liniments.
13. Lysol.
14. Mag. Sulph.
15. Mist. Senna Co.
16. Ol. Ricini.
17. Picric Acid 2 %.
18. Pot. Carb, Bicarb, Brom, Iod.
19. Quinine.
20. Soft Soap.
21. Tinct. Iodi.
22. Tc. Benzoin Co.
23. Tc. Ammon. Carb.
24. Tc. Opii.
25. Ung Sulphuris.
26. „ Boricum.
27. „ Hydrarg. et Ammon.
28. Vaseline.
29. Zinc. Oxide.
30. „ Sulphate.

For the new ship doctor it is useful to remember to have

1. Anæsthetics.
2. Analgesics.
3. Antiseptics.
4. Antipyretics.
5. Cardiac Stimulants.
6. Cerebral Depressants.
7. Emetics.
8. Expectorants.
9. Purgatives.
10. Styptics.
11. Vaccination Lymph.
12. Dressings.
13. Instruments.

It is wise for the doctor to bring his own hypodermic syringe and platinum needle with tablets of

1. Apomorphine.
2. Atropine.
3. Caffeine.
4. Morphine Hydrochloride.
5. Pilocarpine.
6. Strychnine.

A few books for references are also necessary. When one has all these drugs and instruments one is ready to deal with medical cases and some minor surgical cases.

For the amount of drugs required by law for a ship to carry, a book called "The Ship Captain's Medical Guide," issued by the Board of Trade, furnishes a useful reference.

When the drugs are checked and ordered the doctor has to go to his quarters and begins duty on board. On different ships, different quarters are given to the doctor.

I had to myself a cabin with a dispensary attached. It was quite comfortable. The first time I entered the dispensary the following legend looked down at me from the ceiling "Certified to accommodate one able seaman" and I was then the worst sailor on board.

At the stern is the hospital containing seven beds and it is clean and comfortable.

We have six European officers on board and they are quite friendly if you chum up with them. When the ship is in port a round table conference usually takes place after dinner, and all sorts of stories and yarns are told.

There is a story of the meeting of a British sailor and an American sailor. These two had a bet to see who could tell the biggest lie. The American won the toss and started right away. He said "Once there was a gentleman from Noo York ....." "You win" interrupted the British sailor and walked away.

One night when the Scotch engineer was holding forth on religion, the captain interrupted him and said, "The Scotchman is a great man for keeping the sabbath and all the things he can lay hands on, but the Welshman is a greater man because he prays on his knees on Sunday and on his neighbours for the rest of the week."

One day the second mate greatly excited over an accident came up and said, "Sir, that was very misfortunate, very *mis*fortunate," the captain turned round to me and remarked "see how this Welshman is murdering English, like Lloyd George." Life on board has its compensations.

The ship leaves Hongkong usually at 5 p.m. for Amoy with a general cargo and a few passengers. It takes two days to reach Amoy and on reaching the port the yellow quarantine flag is hoisted up, and the port health officer and his assistants come on board. The crew are first inspected by the boarding officer and the ship doctor, and then the passengers, and if all is well the quarantine flag is taken down and the passengers allowed to land. From Amoy a few hundred passengers board for Singapore and before departure the medical officer again comes on board and together with the ship doctor inspect the passengers. The men are asked to walk past in single file, and as they walk past they are counted, and the boarding officer's assistants examine the vaccination marks and make a dig at both groins for enlarged glands. Those who are not vaccinated are revaccinated. The women and children are separately examined. After all are passed the ship sails for Swatow. The ship doctor has the right to reject any case that is suspicious. It must be remembered that only a few infectious diseases come under quarantine regulations in China ports. They are

(1) Celebro-spinal meningitis.
(2) Chicken-pox.
(3) Small-pox.
(3) Cholera.
(4) Plague.
(5) Typhus.
(6) Yellow Fever.

In American ports trachoma is also included.

The ship stops for a day or two in Amoy and there is some opportunity for sight-seeing. The boat fare to shore is 20 cents. Amoy is a island famous in Chinese history. It has a city like most Chinese cities that defies the principle of hygiene and sanitation. Pigs, dogs and men occupy the same throughfare, and as it were, rub shoulders with each other. Nestling on the hillside, dotted here and there, are historic monasteries, a few centuries old. In front of the alter of the monastery, before huges images of gilded gods, Taoist and Buddhists believers vie with each other in the intensity of their devotion, but the line of worshippers is thinning, and the faith that remains, are the messages carved in beautiful Chinese characters, on rocks and temple walls, by priests and scholars dead long ago.

Far in the distance on the plains shadowed by a monastery are the sapphire roofs of the University of Amoy. This University of which the Hon. Mr. Lim Boon Keng is the Vice-Chancellor, is worth a visit. It is well conceived, well planned and well built. It has the whole plain to itself and the hill behind, is given by the Government to the Faculty of Forestry and Agriculture. There are over 300 students of whom 6 are women. The laboratories are not so well fitted up as ours but the lecture rooms are quite airy and comfortable. The living is quite cheap and for $400 a year, I was told, one could live like a lord.

The Hon. Dr. Lim Boon Keng kindly asked me to tea at his mansion, situated on one of the highest peaks in Kulangsu, an island opposite Amoy. The mansion is surrounded by one of the most beautiful gardens I have seen and on two huge rocks the learned doctor has built a terrace overlooking Amoy. On a clear day he can see the green roofs and red walls of the University he loves so well. Dr. Lim told me that he is trying to make Amoy the centre of regeneration for the Province of Fukien. So devoted is he to his mission that even the mansion in which he will spend the last hours of his life is given over by him to the University. Another Chinese patriot is Mr. Tan Kah Kee of Singapore who has alone financed the building of the University, and is giving every month $80,000 for its upkeep. When I took my departure and walked down the hill I saw on the terrace the solitary and venerable figure wrapt in thought gazing towards his beloved University, dreaming his dream which also is a reality. When I turned the corner the figure was lost in the gloaming.

The ship sails at 6 p.m. for Swatow and arrives at 10 a.m. The same procedure is gone through and more passengers come on board. At Amoy and Swatow the vaccination is done by the boarding officer's assistants and usually they make the scarifications as big as a ten cent piece and when it takes, the whole arm becomes inflamed.

As a result of the earthquake, Swatow now presents a clean appearance. The roads are broad. But at every street corner, houses gorgeously painted, with beautiful signboards proclaim to the world, that they are "first class gambling houses for first class patrons." There are three classes of gambling houses:— 1st class for rich gamblers, 2nd class for fraudulent clerks and small shopkeepers, and 3rd class for coolies and thieves. These houses are farmed out to the highest bidder by General Chan Kwei Ming who is occupying the city, as a means of meeting his military expenses.

After staying for a day in Swatow the ship leaves for Singapore, fully loaded with passengers and general cargo. On my first trip the ship carried 900 passengers and on my second trip 1,600 passengers, for Singapore. The voyage takes 6 days and within this period, it is not unusual, owing to the number of passengers carried, to meet with early cases of small-pox, chicken-pox, cerebro-spinal meningitis, plague and cholera.

On my two trips I met over 60 surgical and medical cases. The various diseases I saw were:—

(1) Anklostomiasis.
(2) Arterio-sclerosis.
(3) Bronchitis-acute and chronic.
(4) Constipation.
(5) Conjunctivitis.
(6) Dysentery.
(7) Dyspepsia.
(8) Epilepsy.
(9) Heat Stroke.
(10) Leprosy.
(11) Malaria.
(12) Prickly Heat.
(13) Rheumatism.
(14) Septic Fever due to Vaccination.
(15) Sea Sickness.
(16) Scabies.
(17) Tinea Tonsurans.
(18) Tonsillitis-acute.
(19) Varioloid.
(20) Variola (small-pox).

And the Emergency cases were:—

(1) Acute Alcoholism.
(2) Black eye.
(3) Caries of Teeth.
(4) Nail in the Heel.
(5) Scalp wound.
(6) Sprain ankle.
(7) Toothache.
(8) Wound in palms of hand

I do not think it necessary for me to describe the treatment of the various diseases I came across, but I should like to describe in general terms the treatment of some of the diseases that are so common that the ship doctor often neglects to take precautions.

The first and foremost stands sea sickness that often gives rise to a series of complications.

Sea-sickness as is well-known, is traceable to the

(1) Ocular Apparatus.
(2) Auditory Apparatus.
(3) Olfactory Organs.
(4) Alimentary System.
(5) Nervous System.
(6) Posture.

The Eye owing to the rough sea has to accommodate to rapid and sudden changes of scene, and eye strain is thereby caused giving rise to nausea and vomiting.

Wearing a patch over both eyes or shutting both eyes as in sleeping, often prevents sea sickness.

In the Ear the fluid in the semi-circular canals has to adapt itself to the changes of position owing to the choppy sea. In adapting itself to the changes of position it has to move in a certain direction for a certain length of time and this continuous movement sets up a reflex irritation causing giddiness and nausea. At the same time the noise and vibration of the engines tend to intensify the reflex action. In my own case I found that plugging the external auditory meatus with cotton-wool thus stopping the noise, and removing a certain amount of air pressure, cured my sea sickness. The sense of smell is also one of the factors involved. The cabin of a ship has a peculiar odour and sometimes this smell alone is enough to cause sea sickness, owing to the stimulation of the olfactory nerve endings.

Smelling *eau-de-cologne* or plugging the nose with cotton wool is the remedy in this case.

The bowels must be kept open so that intestinal toxaemia may not be a contributory cause.

A highly sensitive nervous system causing a ready response to any slight stimuli is also a cause of sea sickness. For this Leonard Williams recommends Ammonium Bromide 10grs. a day for three days.

Owing to the movements of the ship the stomach is also physically affected thereby causing irritation and vomiting.

The treatment of sea sickness therefore resolves itself into:—

(1) Keep the bowels open.
(2) Prevent eye strain.
(3) Remove the noise and the external air pressure.
(4) Keep a pleasant smell in the cabin.
(5) Take drugs.

(a) Ammon. Brom. 10grs. t.i.d. for 3 days.

(b) Chlorotone (Chlorbutol) 5-10grs. in cachets when sea sickness threatens.

(c) Burney Yeo recommends only lime water, or a drop of creosote in a tablesponful of lime water, mix throughly and taken hourly.

The second important disease is small-pox. In a case of fever where the patient complains of headache, backache, and vomiting suspect small-pox and have him placed under observation and isolated. Vaccinate all the contacts and also place them under observation. I had a case of haemmorhagic small-pox, that did not show itself until Singapore was sighted. Owing to isolation and the vaccination of contacts, the disease did not spread. The third class passengers were quarantined for a week in St. John's Island, Singapore, and after all the crew and the other passengers were vaccinated, the ship was fumigated and disinfected and allowed to depart.

Another thing that causes the ship doctor endless trouble is the vaccination fever and sometimes septic fever due to a septic scarification. A dose of saline purgative or Mist Senna Co. and the application of a dusting powder of Zinc Oxide and Boric Acid over the septic wound often evoke expressions of gratitude from the sufferers.

A passenger came to me suffering from toothache. I suggested extraction of the offending stump but unfortunately the only suitable instrument I had was a Spencer Well's artery forceps and the grip on the stump was bad. The stump refused to come off and I had to plug the opening with cotton wool soaked in creosote to relieve the sufferer. The moral is, keep a pair of tooth forceps, especially on a long voyage.

The ship stops for a day at Singapore, where the passengers after the usual medical inspection are permitted to land. A number of our graduates are practising in Singapore and it seems to me that every one of them owns either one or two brand new cars. It is the usual practice of Indian doctors there to give free consultation and charge extra for the medicine, which they dispense at their own dispensary. It seems that every doctor owns his own dispensary. I do not know how far such a practice is in conflict with medical ethics. The only redeeming feature is the spirit shown by our medical men. Whenever they receive a case previously treated by another doctor, they always tell that doctor first before they treat the case. The other doctors seemed to resent this ceremony and so the only doctors who are carrying out this medical etiquette are those from this University. In fact, I say it without malice, that our men there, are the only few who realise what medical ethics mean.

After a day in Singapore the ship leaves for Bangkok with cargo only. The voyage takes three days. In Bangkok the port health officer comes on board at Pak Nam at the mouth of the river, 20 miles from Bangkok. After feeling the cervical glands of the crew, the officer permitted the ship to steam into Bangkok.

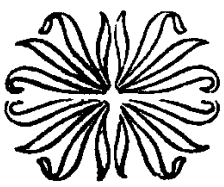
In Bangkok the places worth visiting are the Pasteur Institute with its Snake Park, and the King's Palace. In the Pasteur Institute which is built of marble and white tiles, and with all the facilities for research, one to two hundred rabbits are always being immunised for the antirabic treatment by the spinal cord preparation. Within the short space of this paper, only a rough outline of the method of preparation of the spinal cord employed there, can be given. The skull of the rabbit is trephined and the virus inoculated into the brain. The opening is sewn up and after 7 days the disease manifests itself, the rabbit is killed and the spinal cord removed. The cord is now attenuated by drying in air over bottles of caustic potash in a glass chamber, for a number of days. Usually after seven days drying the cord is ready for use. The treatment is by using the materials from the cord in which the virus was of varying degrees of intensity.

The Snake Park is a circular enclosure surrounded by a high wall where the snakes are reared in cement-made domes. This park is bigger than this assembly room and is divided into three sections. One section is for the king cobras, one for the ordinary cobras, and one for Russel's viper, bungarus and poisonous water snakes. From these snakes antivenene according to Calmette's method are prepared. There are six types of poisonous snakes found in Bangkok, cobra, bungarus, Russel's viper, green pip viper, poisonous water snakes, and *moo chi thong*. The mortality from snake bite is quite high. In the Bangkok court two cases occurred which gave a side light on Bangkok life. A Chinese merchant was summoned for refusing to pay for a consignment of liquor, costing about ten dollars a case. The judge asked him why the whisky was so cheap. The Chinese merchant replied, "Your lordship, at present it is not whisky, but when it comes to me it becomes whisky." The other case was that of a Bombay merchant who refused to accept a broken case of goods. It transpired that the case contained buttons of Bangkok ticals and satangs, made in Birmingham. After staying two days in Bangkok, the ship leaves for Hongkong with a cargo of a few thousand bags of rice. When Hongkong is reached the doctor prepares his list of drugs for the company, receives his cheque, and signs off at the Mercantile Marine Office. It is the end of a perfect day.

On board the doctor is all powerful where health is concerned. He can afford to be lazy if he wants to because there is no one to control him, but it is usual to inspect the passengers once every day and to instruct the compradore to

report to him any case of sickness or death. A young doctor is liable to think lightly of his responsibilities, but experience on board a ship even for a few months, where the lives of a few thousand passengers rest in his hands, will sober him and make him feel that he is really a member of a noble and ancient profession. In the hospital where the work is almost mechanical through routine, and the responsibilities mainly resting on the shoulders of the chief of the department, the young doctor is liable to take life too easily, and may not feel so self reliant as one who has worked on board a ship.

But, however, there are advantages on both sides and I think it wise for a young doctor to take a hand at every thing his profession offers, before settling down to a general practice or devoting his life to research work in the cloistered seclusion of a laboratory.



THE CADUCEUS

JOURNAL OF THE HONGKONG UNIVERSITY MEDICAL SOCIETY

All medical papers and other scientific contributions intended for the Journal, and all books for review and magazines in exchange, should be addressed to the Editor, "Caduceus," Hongkong University, Hongkong.

Changes of address of members of the Society and all business communications should be sent to the Business Manager, "Caduceus," Hongkong University, Hongkong.

Editorial.

We are late in our present issue. Our contributors and the various firms advertising in our pages are no doubt wondering at the cause of our lateness. We beg to explain that this delay in making an appearance is partly unavoidable, but mainly purposeful. The unsettled condition caused by the internecine war up North has raised a doubt as to the advisability of medical missionaries leaving their threatened homes and fields of labour for the January Conference in Hongkong. The representatives of the C.M.M.A. lately arrived in Hongkong and only came to a definite decision regarding the Conference a week before we went to press. The present issue being the last one before the Conference, we desire to have inside it, all the details concerning the Conference, and the delay in fixing these up, has unavoidably led to a delay in publication. Further as our next issue is intended to be a "Conference" number, we shall not be able to publish until late in February, and to avoid too long an interval we decided to delay the present issue.

Our Predecessors.

We would like to take this opportunity to express the Society's indebtedness to our predecessors, Drs. C. Y. Ng, and M. K. Yue, who have laid a firm and solid foundation, leaving us to erect upon it an edifice, the beauty and size of which compared with others in the scientific world, depend on the quality and quantity of the bricks supplied us by our undergraduate and graduate bodies. Dr. Ng edited the first issue, in which he put before us those lofty ideals we have been trying to live up to. That Dr. Yue has done yeoman service to the Society is common knowledge. He was Secretary of the Society during the Session 1921-1922, and editor of the Caduceus for two years. Having been in constant contact with him during all the early issues, we can testify with due praise and respect to the great amount of energy and work he has expended in making the journal what it is to-day.

Dr. Yue has proceeded to England to further his studies in Public Health and Hygiene. Being a zealous patriot, we are certain that the call of China will soon bring him back to us, and we have little doubt that he will be among the foremost of our medical pioneers in China, exploring new scientific fields, and carrying the banner of the University to every corner of this vast land.

Play the Game.

Much though we may dislike to bring out and discuss a distasteful subject, we hope that a bold and free discussion will dispel strained feelings and bring us nearer to the lofty ideals of our profession. What we are going to say is intended chiefly for those of us who are about to graduate and whose welfare in life occupies our deep concern.

We have heard strange things relating to the observance of medical ethics, and though we should like to turn a deaf ear to what we have heard, the detrimental result such rumours have on the good name of the University prevents us from ignoring them. It is not our intention to name the various breaches of medical etiquette which have reached us. Suffice it to say that we have heard of instances of violation of more than half of the following medical ethical principles, which are supposed to have been adopted by the Registered Medical Practitioners of Hongkong:—

1.—A medical practitioner should not advertise directly or indirectly except so far as to place his name and qualifications on his plate at the entrance to his house or consulting room.

2.—He should neither directly nor indirectly canvass for, nor solicit practice.

3.—He should not employ unqualified persons to do the work of a doctor save under his immediate personal supervision, nor should he in any way "cover" the work of such persons.

4.—If in general practice, he should not keep an open shop for selling drugs or medical accessories to the general public, though he may provide these for his own patients.

5.—He should not be in any way associated with the manufacture or sale of any secret remedy.

6.—He should, when practicable, avoid treating a patient whilst under the direct treatment of another doctor, except in cases of emergency. If a patient changes his regular medical attendant, the second doctor should, where practicable, inform the first doctor of such change, or request the patient to do so.

7.—If one practitioner is called into consultation upon the patient of another practitioner, he should not subsequently undertake the general treatment of such patient, save with the consent of the first practitioner, at any rate not until after the lapse of a reasonable period of time.

8.—He should not express any opinion to members of the general public upon the treatment of a case which he has not seen. In all circumstances, he should avoid criticising the work of a fellow practitioner to non-medical persons.

9.—He should always esteem it a privilege to treat a fellow practitioner and his family.

10.—He should always regard any information about his patients obtained in the course of his professional work as secret and confidential.

11.—He should never give any false or misleading medical certificate.

It is self-evident that violation of any these ethical principles lowers the prestige of the profession. Let us with all candour ask ourselves, is it fair to those members of the profession who are sacrificing their lives, fighting devastating epidemics in undeveloped fields where hardship and danger face them at every turn? Again is it fair to those who are devoting their whole life-time trying, by their researches, to contribute their part in lifting up the medical profession?

The amount of faith which the public has for the medical profession lies solely in the hands of the medical practitioner, and it is his sacred duty to see that the trust is not abused. Lately, the public of Hongkong has raised an outcry for German doctors. It is an obnoxious habit to bring national feeling into play especially in the realms of science, and we thoroughly discourage such an action on the part of the public. From letters published by the press, we can with all fairness draw two conclusions. Firstly, that the public pays homage to German powers, with no other reason than the pagan has, in respecting the powers of his god. Secondly, that the practitioners of this Colony with British degrees are neglecting their duty if they allow the public to question their powers. Beyond reassuring the laymen that British degrees are, to say the least, as good as that of any other country from every point of view, we shall not discuss our first conclusion. Regarding the second, however much we may dislike to expose our own faults, it is much better to realise and correct them ourselves than to have them pointed out to us by others and still go on refusing with obstinacy to see them. With due respect for the feelings of our practitioners, we beg

to be allowed to remind them of strict punctuality in answering calls; a thorough examination of every case, however, slight the complaint may appear; and above all, a strict observance of medical ethics.

Many will accuse us of being presumptive in our statements, but to our graduates, whose welfare we foster even at the risk of displeasure we plead not to be misunderstood. What we have said may appear to be bitter and unkindly, but the bitterness is sweetened and the unkindness softened by the straight-forwardness and goodwill of the purpose that is behind them.

Our sole aim is that the name of the University shall be maintained by men whose medical integrity is beyond question.

Joint Conference of the Hongkong and China Branch of the British Medical Association and the China Medical Missionary Association.

January, 1925.

The China Medical Missionary Association was founded in 1886 and at present has about 600 members. These include chiefly British and American missionaries and certain Chinese and Foreign doctors who are in sympathy with the work of the Association. Western Medicine was first introduced into China in the early 19th. century and the progress that has been made has been almost entirely due to the work of medical missionaries. Since 1915, a considerable amount of assistance has been forthcoming from the China Medical Board of the Rockefeller Foundation, the chief work of the latter being the creation of the present Peking Union Medical College, originally a missionary effort.

The Association meets biennially in different cities of China but this is the first time it has been to Hongkong—this has been made possible by the invitation of the British Medical Association, the South China Branch of the C.M.M.A. having its headquarters in Canton.

Since 1887 the Association has published the China Medical Journal which until 1915 held the field as the only journal of western medicine regularly published in China.

In 1915 the National Medical Association of China was established for Western trained Chinese, with a National Medical Journal, while in 1922 the Hongkong University Medical Society first published a journal known as the "Caduceus."

The Hongkong and China Branch of the B.M.A. was first established in 1890 and grew out of the Hongkong Medical Society founded in 1886 with the late Sir Patrick Manson as the first President. Members now number 158—39 resident in Hongkong.

In 1887 the Alice Memorial Hospital was opened under the auspices of the London Missionary Society and the Hongkong College of Medicine was founded with Sir Patrick Manson as the first Dean. From the College of Medicine came the University and its medical school in 1912.

It is worthy of special notice that the two associations about to meet should have been independently founded in the same year and that the University in whose buildings the meeting is to be held had its origin in the foundation of a missionary hospital. Further, that the father of Tropical Medicine was the first President of the Hongkong Association and the first Dean of the Medical College.

The Conference undoubtedly provides an opportunity for the University Medical School to show its possibilities as a centre for the spread of Western Medicine more particularly in South China. These possibilities have already been recognised by the Rockefeller Foundation through its gift of $750,000 for the endowment of full-time chairs in Medicine, Surgery, Gynaecology and Obstetrics, and the contributions of the China Medical Board towards a scholarship fund for students to come from the Canton Christian College to the University for their medical course. The Conference will also provide an opportunity for the British and Chinese Community in Hongkong to learn something of what is being done for Western medicine in China and encourage them to make their own contribution, in return for the commercial and other benefits they derive from their residence in Hongkong.

Conference Arrangements.

As already stated in previous issues the Conference will be held at the University from January 21st-28th, 1925.

Three days, January 21st-23rd, will be devoted to scientific work and three days January 26th-28th will be devoted to the special missionary problems of the C.M.M.A.

There will be an interval of two days, Saturday and Sunday between the two programmes which will give opportunities for sight-seeing and social entertainments. A trade exhibit is being arranged to be held in the Great Hall and there will be demonstrations of the latest surgical and medical appliances, drugs, disinfectants, food products, and books. A special exhibit in X-ray technique is being arranged by the Victor X-Ray Corporation.

We are expecting delegates from scientific bodies both in America and Great Britain, as well as from regions more locally situated. Special invitations have been accepted by Dr. Ernest Muir of leprosy fame, now working at the Calcutta School of Tropical Medicine, and by Dr. Ambrose Thomas Stanton, Director of Government Laboratories, F.M.S.

An invitation has also been sent to the University of Sydney to send a delegation, in view of the importance of forming a direct link on Pacific problems with the Australian continent. Both the China Medical Board and the American College of Surgeons have promised to send delegates, and it is probable that the central office of the B.M.A. London will do likewise.

Mr. Gask, Surgeon in charge of the Surgical Unit at St. Bartholomew's Hospital, London, was invited but is unfortunately unable to get away.

It should be mentioned that such direct invitations to individuals have been made possible owing to the generosity of the local profession which independently organised a fund to cover travelling expenses.

Annotations.

Discussion on the Treatment of a Case of Clonorchiasis.

Cheah Toon Lok. M.B., B.S.

On July 1st, 1924, a male Chinese, 43 years old, born in Macao, and living at Victoria Street in Hongkong was admitted to the Surgical Ward for a swelling, of the lower part of the left chest, of 3 years duration. He was a tea merchant by occupation and was married and had a wife and child both alive and healthy. He had regular habits and did not drink alcohol nor smoked opium, although he smoked tobacco. He denied previous venereal history.

The history of the complaint was as follows:—

Six years ago, that was in 1918, when tea farming in Formosa, a chest of tea fell on him during the collapse of a godown. He was hurt and had to be in bed for a week.

In 1919 a lump appeared in the region of the epigastrium, slightly to the right side of the mid-line of the body. This lump did not give him any pain unless firmly pressed upon. An operation lasting two and half hours was performed and a "mass of blood-like substance with veins hanging down" was removed.

In 1920, a swelling appeared at the same region. This swelling was painful except only when Chinese medicine was applied to it. A sinus appeared soon afterwards, and a white sticky fluid resembling bean starch oozed out of the sinus, and the swelling slightly subsided.

FIGURE SHOWS SINUS AND PROMINENT VENATION.

In 1922 the swelling became prominent again, accompanied by oedema of both legs. He recovered leaving a number of prominent superficial venation.

In 1923 another swelling appeared on the left side of the abdomen. It increased and diminished in size but there was no discharge. It now persists after six recurrences.

In April, 1924, a white spot appeared on the swelling and it grew bigger and bigger until it finally burst, giving a yellowish green sticky discharge.

The discharge still persists and the sinus is found to be 3 inches deep.

Surgical Report.

Albumin	absent.
Sugar	absent.
Heart	normal.
Lungs	normal.
Abdomen	enlarge spleen and liver.
Anaemia	present.
Pupils	normal.
Teeth	bad.
Knee jerk	present.

There was a sinus in the epigastrium a little to the right of the mid-line of the body. There was discharge from the sinus. The discharge contained soft calculi and was tinged green with bile and pigments.

The liver and spleen were enlarged and varicose veins were found on the thorax and these were found to be continuous with those of the upper and lower limbs as well as those on the anterior abdominal wall. The blood was found to flow upwards.

On July 4th, 1924, a discussion was held at the bedside by the Surgical Firm, but no decision was arrived at, except that the dilated veins on the chest wall were due to a disease of the liver, thus causing pressure on the Portal Vein but not on the Inferior Vena Cava.

Prof. J. Anderson was called in to see the case and he suggested that

(1) The Urine be tested again for albumin.

(2) An examination of the stomach contents be made.

(3) The original trouble might have been at the pyloric end of the stomach, and the present condition secondary. There might be a deficiency in the gastric juice.

On July 5th. 1924, the patient was then transferred to the Medical Clinic.

Medical Report.

The patient was admitted for a sinus of four months duration in the epigastric region.

On admission, patient was anaemic, temperature 98.4 Fh, and pulse 80. A sinus was seen in the epigastric region and from it a greenish fluid like bile was discharging continuously. There were no black specks in the discharge. Marked superfacial venation could be seen on the thorax, abdomen, and on both legs.

Alimentary System.

Lips....pale.
Teeth....good.
Tongue....Clean.
Gums....good.
Appetite....good.
Bowels....twice a day.

Abdomen.

Inspection.	Abdominal wall moved with respiration Superfacial venation was present being more marked on the chest wall and along the lateral side of the abdomen.
Palpation.	Liver was enlarged. The lower border was 4 inches below the costal margin in the nipple line. It was hard and nodular on pressure. The spleen was 2½ inches below the costal margin in the nipple line.
Percussion.	Confirmed above.
Rectal Exam.	Nothing of importance found.
Faeces.	In July, on two examinations no ova were found.

Respiratory System.

Inspection.	The chest was flattened and broader below than above. Movements were equal on both sides. Rate of respiration was 16 per. min.

Percussion. The apices were normal. The right base was duller than the left.

Auscultation. Rhonchi could be heard on the right side, over the 1st and 2nd interspaces near the sternum. On the right base a rub and an occasional rhonchi could be heard during expiration. On the left there were no adventitious sounds.

Cardio-Vascular System.

Pulse ..... 80.
Rhythm ..... Irregular.
Volume..... Medium.
Tension..... Medium.
Arterial wall was not thickened.

Blood. Haemoglobin index (Tallqvist) 60.
Differential Count.

Polymorphs	40 %
Small Lymphocytes	30 %
Large „	10 %
Hyalines	6 %
Eosinophils	14 %

Heart.

Inspection. Apex beat was seen at the 5th interspace internal to nipple line.

Palpation. Confirmed above.

Percussion. No enlargement of heart found.

Auscultation. No murmurs heard. Heart was irregular in rhythm and force. There was a dropped systole.

Nervous System.

Knee jerk	Present.
Ankle jerk	Present.
Ankle clonus	Absent.
Knee clonus	Absent.
Babinski	Absent.
Romberg's	Absent.
Argyll Robertson Pupil ...	Absent.
Cutaneous Sensation.....	Good.
Deep Sensation	Good.
Mentality	Good.
Motor Functions	Normal.

Diagnosis.

A smear of the discharge from the sinus was taken and stained by Gram's method. Safranine was used as a counter stain. On microscopic examination numerous ova of Clonorchis sinensis were found. It was rather difficult to find the ova in an unstained smear from the biliary secretion. Gram's iodine and safranine help to bring out the ova quite well, the shell being more deeply stained than the other parts.

The Levitation Method of detecting helminth eggs, as described by Clayton Lane and modified by P. A. Maplestone of Sierra Leone was employed in the examination of the faeces. A saturated salt solution, having a specific gravity of slightly over 1200, in a small watch glass was used. Two loopfuls of faeces were taken so as to keep within the limit of effective concentration and mixed in the watch glass. A clean glass slide was then laid on the watch glass touching the distinctly convex meniscus of the emulsion in the watch glass. The ova adhered to the contact surface of the slide. Examine it under the microscope in the usual way.

In this case ova of Clonorchis sinensis were found.

A direct smear from the faeces also showed, with difficulty, ova of C. sinensis.

The Wasserman was strongly positive.

An examination of the stomach contents was made. Ewald Test Meal was employed.

No food after 6 p.m. on the previous evening.
Give one slice of bread with one pint of plain tea.

Half an hour afterwards stomach contents by means of stomach tube were withdrawn, and examined for free HCl.

Results in this case. Free acid—Nil by Gunzburg's test.
Total acidity—10.

Treatment.

1.—Mist Ferri Et Arsen. 1 oz. t.i.d. p.c.

Owing to the patient's anaemic condition this mixture was given him for five days. Dakin's dressing, twice daily, was applied to the sinus.

2.—Intravenous Injection of Antimony Tartrate.

On July 8th, PULV. SALOL grs. 10. was given morning and night. Then a course of intravenous injection of Antimony Tartrate was started. The solution used was specially prepared, containing ½gr. of Antimony Tartrate in 1 c.c. of sterilised distilled water.
The injection was given on alternate days starting with ½gr. and rising by ½gr. on each subsequent injection, to the full dose of 2½grs., when this dosage was continued until 30grs. were given in all.
Ova were still present in the smear from the biliary sinus, though not so numerous. Ova were also seen in the faeces.

3.—Mist K.I. Et Hydrarg. 1 oz. t.i.d. p.c.

After a rest of two days this mixture was given and the results were still the same.

4.—Mist K.I. 1 oz. t.i.d. p.c.

This was given on August 14th and continued to September 23rd, when Mist K.I. et Hydrarg. was again substituted. On 25th ova were still present in the discharge.

5.—Emetine Hydrochloride.

On October 4th intramuscular injection of Emetine Hydr. was started beginning with 1gr. and rising to 2grs. until 11grs. in all were given.
Quinnine Sulphate powder was used for dressing.
There was little improvement and on October 15th ova was still present in the discharge.

6.—Carbon Tetrachloride.

On October 23rd, a course of Carbon Tetrachloride was tried. 1 c.c. in a gelatin capsule was the initial dose employed. A period of three days was the interval between each subsequent dose given, and the dosage was increased to 2 c.c. if the patient could bear it, otherwise the original dose was resorted to. The patient's condition, especially his heart was carefully watched. In all 8 c.c. were given.

The result of this treatment was quite encouraging as the size of the liver has slightly diminished and very few immature ova are appearing in the biliary secretion and in the faeces.

The patient developed an extra systole in the heart beat during the treatment and on two occasions digitalin had to be injected. Nothing can be definitely stated about this treatment until further experience has been acquired.

Discussion.

The case is interesting because, although Clonorchis sinenis infestation is quite common in South China, it is not as harmless and as neglible a factor in the causation of hepatic diseases, as text-book authorities, would like one to believe.

It is also unique in that, the result of treatment, can be quickly ascertained from a smear of the biliary sinus.

In this case, like in other cases within the writer's experience the treatment with Antimony Tartrate has been disappointing, although Clayton Lane suggests that Antimony Tartrate intravenously is worthy of trial.

Darling, Barber, and Hacker report that Chenopodium oil is effective in expelling clonorchis, but the experience in the University Medical Clinic has not been encouraging and in this case it has not yet been tried.

This chronic hepatic form of clonorchiasis, doubtless suggests the use of a more powerful antihelmintic than Chenopodium oil. Carbon Tetrachloride being a less expensive and more powerful antihelmintic than Chenopodium oil as shown in the treatment of hookworms, was tried. So far the number of ova in the biliary secretion has been greatly reduced, and more immature forms are found. The number of ova appearing in the faeces is also considerably reduced and only after a thorough examination of the faecal slide a few immature ova could be found. This seems to suggest that the duodenal form of clonorchiasis is more susceptible to Carbon Tetrachloride treatment than the hepatic form.

Although the biliary smear are showing few ova, yet the sinus does not seem to be healing, even after the following dressing have been for a longer or shorter period applied, Dakin's, Boracic, Quin. Sulphate powder, and Lotio Rubra. Such a condition rather suggests that the fluke secretes a proteolytic substance that prevents healing.

The absence of ova in the faeces in July rather suggested that the original infestation was hepatic, although of course at that time the Levitation method was not yet employed.

This case is rather in the nature of a preliminary communication on clonorchiasis in South China and many facts relation to distribution, incidence, etiology, clinical signs and symptoms, pathology, prognosis, and the morphology of the fluke are not recorded until a fuller knowledge of this parasite has been acquired, and investigations in other directions accomplished.

The writer is greatly indebted to his chief, Prof. J. Andersor for a number of things, especially for his advice and permissio to record this case.

A Case of Hydrocephalus.

Li Tsoo Yiu. M.B., B.S.

Tsang Bi, male, Chinese, aged 4 months, was admitted to the University Medical Clinic on 15th September, 1924 for enlargement of head.

History of Present Disease.

When patient was two months old, the parents noticed that the head of the child began to enlarge. There was no history of either trauma or fever previous to this enlargement.

Condition on Admission.

(a) General condition—The child is irritable and cries a great deal. The enormous rounded head contrasting with the small face together with the downward rotated eyes and abnormally high forehead give a text book picture of a hydrocephalic child. Temp. 99·4°F. Pulse 146 per min.

(b) Condition of Head—On inspection, the head is roughly globular in shape. There is well marked superficial venation of the scalp of which the skin is thin tense and glistening, with hair sparsly distributed. On palpation, the anterior and posterior fontanelles are widely open and the sutures are gaping. The maximum circumference of the head is 22 inches and the antero-posterior diameter is 16 inches.

Treatment: Puncture of the Ventricle.

The first puncture was performed on 27th September, 1924, i.e. eleven days after admission. Patient was prepared for operation in the ordinary way, the strictest asepsis being observed. After open ether was given the part for the operation was painted with iodine. A large serum needle was used for the puncture and the site chosen was the left lateral angle of the anterior fontanelle, care being taken to avoid the distended superficial veins. The needle was pushed in at right angles to the surface of the scalp and the fluid was drained off at the rate of one drop per second. During the process of drainage patient's pupils and pulse were carefullly watched. 70 c.c. of fluid was drained off. Wound was sealed with collodion and a sterilised dressing was applied.

Measurement before first puncture
Maximum circumference =22.5″
Antero-posterior diameter = 16″
Measurement after first puncture
Maximum circumference = 22″
Antero-posterior diameter = 16″

On the evening of 30th September—three days after the puncture—patient had a temperature of 101·8°F. This was probably due to intestinal intoxication present at that time.

Patient's scalp became quite tense three days after the first operation and on the 2nd October, the measurements were

Maximum circumference = 23″
Antero-posterior diameter = 16″

On 5th October, i.e. eight days after the first puncture the temperature went up to 104·2°F.

A second operation was performed on 6th October and an aspiration needle was used instead of a serum needle and the right ventricle was punctured instead of the left; the site of puncture was the right lateral angle of the anterior fontanelle. 75 c.c. of fluid, which was slightly blood stained, was drained off. The temperature came to normal and the child slept well after the operation.

Measurement before second puncture

Maximum circumference = 23″
Antero-posterior diameter = 16″

Measurement after second puncture

On 10th October—Maximum circumference=20″
On 15th ,, — ,, ,, =20¾″
On 17th ,, — ,, ,, =21¼″
On 18th ,, — ,, ,, =21¾″
On 20th ,, — ,, ,, =22″
On 23rd ,, — ,, ,, =22¼″
On 29th ,, — ,, ,, =23¼″

On 31st October, a third tapping was done and this time, 100 c.c. of fluid was evacuated and the left ventricle was chosen. The fluid was not blood stained but it was slightly turbid.

The following is the measurements after the third puncture:—

On 1st November—Maximum circumference=19″
On 3rd ,, — ,, ,, =19″
On 5th ,, — ,, ,, =19½″
On 7th ,, — ,, ,, =19¾″
On 9th ,, — ,, ,, =20″
On 11th ,, — ,, ,, =22″

At the time when this article was being written patient was quite comfortable, apart from the hydrocephalic condition, the child was as healthy as a normal child.

Thanks are due to Prof. J. Anderson, physician in charge, for his kind permission to publish this case.

Two Cases of Intrahepatic Stone Formation and Suppression of Bile.

A. G. M. Severn. B.A., M.D., M.R.C.S., D.P.H.
and
Professor Kenelm H. Digby. F.R.C.S.

The two following cases seem worthy of note as illustrating a pathological condition which we have not met before nor seen described.

Both cases were males aged respectively 34 and 38. They were admitted to hospital for acute abdominal pain, fever and jaundice. In one case there had been a previous attack of abdominal pain from which the patient had recovered. In both cases the jaundice was of moderate degree, bile and albumin were present in the urine. The liver was of enormous size and tender. The gall bladder was greatly distended, in the one case it formed a visible tumour in the right iliac fossa; in the other case it could not even be palpated with certainty being overlapped by the liver, but its great increase in size was demonstrated subsequently.

In each case the condition was due to general stone formation throughout the ducts in the liver. The gall bladder and bile duct (old terminology common bile duct) contained only mucus (so called "white bile") under tension and a small quantity of black granular detritus. All the hepatic ducts were occupied by solidified bile. Some of this formed softish facetted black calculi, the rest was a soft mould of the lumen of the ducts. It was almost as if the bile in the liver had coagulated in the course of a short space of time.

It was not the presence of the so called "white bile" which was unique in this disease. We all know that obstruction of the cystic duct by a small calculus will lend to "white bile" in the gall bladder, that is the bile present is absorbed, no more can enter and the mucus which is secreted by the lining mucous membrane distends the gall bladder. We also know that a stone completely blocking the ampulla may cause (especially if the gall bladder—the safety valve of the duct system—has been previously removed) a rise of pressure inside the bile ducts so that a true suppression of bile secretion takes place, though secretion of mucus still goes on producing "white bile" in the ducts.

In our cases we must suppose that stone formation in the hepatic and intrahepatic ducts lead first to jaundice and then to complete suppression of bile. The bile duct and gall bladder then filled with mucus.

It is still difficult to see why the gall bladder and common bile duct were so greatly distended. No definite impaction of a stone was found at the ampulla in either case at operation, nor was any found at the post mortem in the one case that died, though a small quantity of softish debris was present in the bile duct.

Intrahepatic stone formation is uncommon. Bland Sutton in "Gall Stones and Diseases of the Bile Ducts" quotes several cases. The condition may be due to excretion of a chemical irritant or of bacteria in the bile. The prevalence of clonorchis in this part of the world led us to examine the bile discharged after operation on one occasion in one of these cases, but nothing was found. (It is interesting here to note that Professor Anderson has since discovered great numbers of clonorchis ova in the bile stained discharge from a fistula following an operation many years before in another case. The patient here had an enormous liver with extreme superficial venation. He was transferred for further observation from the Surgical to the Medical Unit where the ova were discovered. He has improved under treatment with antimony tartrate.) *

With regard to treatment one might fancy it was hopeless judging from the widespread calculus formation. But our first case recovered and went out seemingly well and our second case would probably have survived if (1) greater care had been taken in tying off the minutest bleeding points on the amputated gall bladder and (2) if glucose had been available as in the first case. Mann at the Mayo Clinic has shown that a dog from which the liver has been removed will die in 2 or 3 days, but if glucose be administered such a dog can survive three weeks.

The hepatic duct should be freely opened as close to the liver as possible. This is not very easy as the enlarged liver over-hangs so greatly. The stones inside enable it to be identified and careful palpation must be made for pulsation due to any possible large vessels crossing the duct at the point of opening. Stones can be removed as far up as 3 or 4 inches inside the liver and the jam relieved, and a rubber tube 2 cm. in diameter inserted into the dilated duct. Absolute haemostasis should be observed, horse serum and intramuscular injections of calcium chloride given and glucose administered by rectum. It is perhaps well also to drain the gall bladder.

*Case Annotated on p. 136.

Case No. 1. Chan How, male, 34 years, a basket maker was admitted to the Civil Hospital on 21st April, 1924 with an attack of severe abdominal pain.

There was a history of a previous attack of abdominal pain which took place 9 months ago. The pain was of sudden onset, was chiefly noticed in the right hypochondriac region, and lasted for two days during which period the appetite was poor and the motions were black and soft.

The present attack was ushered in by a chill 3 days before admission. For a whole fortnight however, there had been constipation—one action of the bowels in about five days. The chill was followed by fever and pain all over the abdomen especially in the right subcostal region. The patient felt dizzy and his motion was soft and black and felt hot during evacuation. The appetite was bad.

The temperature was 101·2°F.

A moderate degree of jaundice was present and the urine contained both bile and albumin.

On examination of the abdomen a large tumour with a suggestion of lobulation on the surface reached below the costal margin. It was dull to percussion, the dullness being continuous with that of the liver above the costal margin. The lower border of the tumour was thickened and ran obliquely downwards and to the right. It moved slightly on respiration and reached a point just below the umbilicus. The tumour was tender and painful.

The greatly enlarged liver with fever would have suggested amoebic abscess; but jaundice is very unusual in such cases. Some calculus obstruction of the common duct seemed more probable.

On the day of admission laparotomy was performed by Professor Digby through a right paramedian incision. The distended gall bladder was found and incised and clear glycerine-like fluid with a little black debris escape. Cholecystostomy was performed. On further examination a large stone was felt projecting from within the liver into one of the hepatic ducts.

This lay at a great depth, it was cut down upon and removed with difficuly as it was tightly impacted. A further large calculus which was slightly moveable was removed from deeply within the liver. Clear glycerine-like "white bile" escaped from the ducts. Further, stones could be felt within the liver but could not be extracted. A second large rubber tube was inserted

into the duct. Laparotomy wound was closed in the usual way. Coloured bile was discovered passing from both tubes by the following morning. The patient was treated after operation with injection of calcium chloride and with rectal glucose and hypodermic injection of morphia. On the 26th April, patient was again carried to the operation theatre but no anæsthetic was administered. A long spoon was inserted along the track of the drainage tube into the hepatic ducts and at least 1 dozen small calculi were removed from the bile ducts in the liver. They were of solid black matter, oval in shape and about the size of peas.

Some of the discharging bile was examined for clonorchis ova on one occasion but none were found.

The patient was discharged on the 17th May, the wound was healed, the faeces were normal in colour, there was no jaundice and the temperature had been normal since the fourth day after operation.

Case No. 2. Ho Shan, Chinese, male, aged 38 years, committed to prison on a charge of keeping an Opium Divan, himself an opium smoker. Routine examination by Prison Medical Officer showed signs of jaundice, and he was transferred to the Government Civil Hospital, on the 22nd May, 1924.

No previous history of attacks of acute abdominal pain, or other serious illness was elicited. He had noticed the jaundice gradually coming on for some few weeks, but had not regarded it as anything serious.

On admission to the Civil Hospital the general condition was not good, the patient being rather thin and poorly nourished, temp. 99·4°. He complained of some abdominal pain. There was a moderate degree of jaundice, yellow sclerotics and slight skin irritation. Tenderness and rigidity over the gall-bladder area was present and the liver dullness extended below the costal margin. No other abdominal signs were present, the gall-bladder was not definitely palpable. Urine contained bile-pigment, bilt-salts, and trace of albumin; faeces rather pale, but not clay-like.

History of Present Illness. On the day following admission patient had a rigor, but the temperature did not rise above 101·0°. During the subsequent fortnight temperature approached normal, generally varying between 98·0° and 99·0°. Patient was kept under observation, on light diet and fluids, the jaundice remained about the same, the bowels were regular. Tenderness in right hypochondrium persisted, with slight rigidity, but without much pain. Salines with vin. ipecac. m.V, and sod. salicyl. grs. X,

were given four-hourly. On the seventeenth day patient had a severe attack of acute abdominal pain, temp. 99·0°, for which morphia was given. On the following day the temp. rose to 101·0°. There was marked tenderness and rigidity over the liver area and right hypochondrium. A large mass, dull on percussion, extended down to the right iliac region, producing a readily visible bulging of the abdominal wall, which moved with respiration. The mass was diagnosed as a greatly enlarged gall-bladder.

The patient was given intramuscular injections of calcium chloride grs. II, three doses at suitable intervals, in preparation for operation. Hypodermic injection of morphia and atropine preceded the anaesthetic, which consisted of ether only, by the closed method. Prof. Digby on the 8th June performed the operation, which consisted in an exploratory laparotomy, partial cholecystectomy and choledochotomy. Haemorrhage from the small vessels was profuse. The free incision disclosed an enormously distended liver, making approach to the bile ducts very difficult and a very large, tense and distended gall-bladder, containing a quantity of "white bile," having the appearance and consistency of slightly diluted glycerine, together with a considerable residue of dark-coloured granular debris. An incision was then made into the bile duct above the cystic duct and close to the liver. Masses of soft friable gall-stones, partially facetted, blocked the bile and hepatic ducts, and extended through the branches of the hepatic duct deep into the liver substance. A number of large gall-stones and fragments were extracted, as far up as 3" into the liver, so that the jam seemed relieved and the remaining stones were freely moveable. Their complete removal was a matter of impossibility. The common bile-duct, as far as its junction with the duodenum, appeared to be patent and unobstructed. The fundus of the gall-bladder, having been pulled forward by a clamp to give better access to the bile duct was amputated, and a medium-sized rubber drainage tube sutured to the stump. The distended bile duct was drained with a half inch diameter tube and a third smaller drainage tube inserted into the right posterior subphrenic pouch. The poor physical condition of the patient did not admit of a more extensive operation.

Normal green bile, in small quantity, commenced to flow, via the drainage tubes, within a few hours of the operation, together with granular debris and small fragments of gall-stones. After-treatment consisted of normal saline, water, and solution of sod. bicarb, in quantities of half-a-pint, given rectally two-hourly in succession for the first day, and afterwards four-hourly. An attempt was made to obtain glucose for rectal administration,

but unfortunately there was none available in the Colony. Nothing was given by mouth for the first twenty-four hours, afterwards fluids at short intervals and in increasing quantities. On the day following the operation patient had persistent vomiting which was relieved by a suitable carminative mixture. Tincture of opium in small doses was regularly given, in view of the patient's opium habit. Temperature ranged between 101·0° and 103·0°. Three days after the operation some blood-clot was passed via the drainage tubes, and the bile which escaped was intimately mixed with blood. This continued in spite of hypodermic injections of morphia, and intramuscular injections of calc. chlor. General condition was fair, temperature gradually decreased, but the jaundice persisted, a slight improvement only being noticeable in this respect. Temp. remained about 100·0°, and there were no signs of general peritonitis. After removal of the drainage tubes, a good deal of blood clot was discharged through the abdominal wound, together with blood-stained bile. The patient became progressively weaker, and death took place on the tenth day after the operation, i.e. on the 18th June, 1924.

Post-mortem examination showed some enlargement of the liver, which was pale and mottled in appearance. Masses of friable stones blocked the main hepatic ducts and extended into the smaller branches, so that the liver appeared to be full of these soft stones. Specimens of these were sent to the analyst for chemical examination. Two separate portions of the liver substance and a piece of the kidney were sent to the pathologist for section. Unfortunately in a considerable rush of work at the time these were unfortunately mislaid. A mass of blood-clot was found in the remains of the gall-bladder, and in the peritoneal cavity on the rightside, extending as far as the right iliac fossa. The common bile-duct was not obstructed, and its opening into the duodenum was normal in appearance. The kidneys were rather pale, and slightly enlarged, the capsule separated readily. There were signs of local inflammation of the peritoneum, but no evidence of general peritonitis. The brain and meninges were normal in appearance, as well also the heart, lungs, spleen, pancreas and other organs as well as the alimentary tract.

Current Medical Literature And Reviews.

SURGERY.

The Preoperative Preparation of Handicapped Surgical Patients.—There is a brief two and a half page article with the above title by Waltman Walters from the Mayo Clinic in the June number of the Annals of Surgery. This article should be read

by every student holding a surgical appointment. It shows how greatly the mortality of operations can be reduced by skill and care in preliminary treatment.

Appendicitis. In the same June number of the Annals of Surgery are three articles on appendicitis. Deaver and Magoun review 5488 appendectomies performed at the Lankenau Hospital, Philadelphia, and Gatch and Durman report upon 262 consecutive cases of acute appendicitis. No agreement is to be found on the vexed question of waiting or not waiting when the case is in its third day. Deaver and Magoun think they have reduced their mortality rates by adopting the Ochsner—Fowler—Murphy treatment in most cases of spreading peritonitis after 36 hours, Gatch and Durman (perhaps more wisely) do "not advise the expectant treatment of appendicitis."

The incision recommended by Deaver for an extra-peritoneal approach to the appendix does not commend itself. The author may well say that "this incision may be followed by a higher percentage of post operative hernias than the type usually employed." Both articles are worth perusal. The vicious custom—still too common—of giving a purgative to patients with acute abdominal pain until inflammation of the appendix has been excluded is rightly condemned. An interesting point in technique is advanced by Gatch and Durman, who condemn "the use of gauze packs to wall off the origin of the abscess. They traumatise the peritoneal surfaces and actually lead to a much wider infection of the peritoneum than would occur if they were not used. When the abscess is opened the conditions of intraabdominal pressure are such that the pus is forced toward the incision. These authors also think that the advantages of the Fowler position are due "not to its supposed tendency to limit peritonitis to the lower part of the abdomen so much as to its beneficial action on the breathing and the circulation."

The third article in this Journal on Appendicitis is by Thomas A. Smith of New York. Its purpose is, to quote the author, "to call attention to the frequency with which *excessive lymphoid hyperplasia of the appendix* in children produces symptoms simulating appendicitis usually of the subacute or chronic recurrent type." The idea is interesting, though not entirely novel. The evidence adduced is the really important point, and deserves close scrutiny. It is based on 37 cases diagnosed as appendicitis (some acute, the majority subacute or chronic). The symptoms were severe colicky pain lasting for several hours to a day or more, and localising itself in the right iliac region. This was associated with definite localised tenderness in nearly every case. Spasm of the right

rectus muscle, nausea, vomiting, fever and leucocytosis "were not constant." The patients were children under 12½ years of age. Pathology:—All these appendices when removed showed little if any change except "marked hyperplasia of the lymphoid tissues."

Results of appendectomy. 30 of the 37 children had been having previous recurring attacks. After operation 2 still continued to have abdominal attacks 6 were not followed up, 29 followed up for periods of from 3 months to 6 years remained free from further attacks. That is the evidence. The weak spot is this: What did the pathologist mean by "marked hyperplasia? No photographs or drawings are given. The amount of lymphoid tissue in the appendices of normal children is vastly greater than in adults. We require a more definite statement such as this: the lymphoid tissue in this child's appendix forms 2/3 of the thickness of the wall, whereas in the average appendix of a child of this age it only forms ½. In the absence of such accuracy one may hold the suspicion that some of these cases were ordinary forms of intestinal colic, not requiring appendicectomy at all.

Splanchnic Analgesia. Two articles have recently appeared on this important subject:—Hillman in the Lancet for 5th July and Hermann Fischer in the Annals of Surgery for March.

The semilunar ganglia and the splanchnic nerves are injected from the back with novocaine solution. This combined with nerve block for the anterior abdominal wall and very light general anaesthesia effectively cuts out all shock in severe operations on the upper abdomen. The method was recently tried in the Civil Hospital for a cholecystectomy with, apparently, the promised benefits. But a blunt acorn-headed needle was used here, the pointed needle recommended being regarded as too dangerous when used close to the wall of the aorta and inferior vena cava.

The British Journal of Surgery for July contains many articles of very great interest in specialised subjects; *external duodenal fistula, thoracoscopy in chest surgery, mesenteric cysts* and the Hunterian lecture by C. Max Page on *the surgical treatment of osteoarthritis.* The latter includes a discussion of methods of approach to the hip joint. There is also a useful article by Henry on *incisions for exposure of the humerus and of the femoral shaft.*

In the Annals of Surgery for May Matas advocates the administration of *a continuous intravenous drip of glucose solution* in various forms of shock and also the use of stomach or duodenal tube through the nose and its retention in situ in the treatment of intestinal obstruction, etc. These methods certainly demand full trial.

Previous reference has been made in these notes to *lymphaticostomy*. In the British Medical Journal for 2nd August Mitchell records a case of failure of the duct fistula to close after this operation with consequent wasting and death. This accords with the experience of older surgeons who feared producing a fistula of the thoracic duct when operating of the left side of the neck, but would not mind tying the duct without wounding it.

K. H. D.

MEDICINE AND PATHOLOGY.

The Archives of Internal Medicine for September has two interesting papers on the Metabolism of Obesity by Strouse, Wang, and Dye. They come to the conclusion that constitutional obesity is a definite entity which is independent of either food intake or expenditure of energy. Their numerous observations point to the fact that obesity and excessive underweight are not associated with any alteration in basal metabolism.

Mills gives a description of ten cases of Haemochromatosis confirmed by autopsy at the Boston City Hospital. Two of his cases were women, thus bringing the number of female cases on record up to three. He considers the cause in several of his cases was chronic copper poisoning.

An important paper by Pilot and Davis discusses the rôle of Spirochaetes and Fusiform Bacilli in gangrenous and putrescent conditions of the lung. In the production of this "fusospirochaete pneumonia," pyogenic organisms especially streptococci play a contributory part.

The Journal of Pharmacology and Experimental Therapeutics.

September, 1924.

Sollmann outlines his investigations on the effect of phosphorus on young rats. In large daily doses, phosphorus checks the growth permanently so that the rats remain stunted. He suggests that this may be due to premature ossification of the epiphyses. On the other hand, small doses produce a decided increase in weight above the normal, but this might be a slow cumulative toxic effect inducing a minor degree of fatty change.

Schmitz and Loevenhart has written up a comparative study of Cocaine, Procaine, Butyn and "Isocaine" as local anæsthetics. They state that Isocaine appears to be valuable for anæsthesia of mucous membranes. It is practically equal to cocaine as an anæsthetic and is only about three-tenths as toxic. Butyn has no advantage over cocaine being no more efficient but of greater toxicity. Procaine which is by far the safest anæsthetic for nerve blocking, is not satisfactory for anæsthesia of the intact mucous membrane.

The Journal of Experimental Medicine.

October, 1924.

Marine, Manley, and Baumann have an interesting article on the influence of thyroidectomy, suprarenalectomy, etc. on the thymus gland of rabbits. They prove that involution of the thymus is hastened by thyroidectomy, but delayed by suprarenalectomy and gonadectomy. The removal of suprarenals and gonads causes a thymus and lymphoid hyperplasia closely resembling the condition in status lymphaticus. The lymphatic constitution which accompanies exophthalmic goitre, acromegaly, and Addison's disease seems to be dependent on a partial suppression of the functions of the suprarenal and sex glands.

Stevens and Dochez discuss their bacteriological observations in the complications and convalescence of scarlet fever. They have isolated haemolytic streptococci from the throats of 65% of cases of scarlet fever during the first week of the disease and from a certain proportion of the cases at the end of 30 days. The complications of scarlatina may be due to a secondary infection with common pyogenic strains of streptococci.

Reimann in a study of the blood platelets in pneumococcus infections finds that the number of platelets begins to diminish after pneumonia has been established and returns to normal about two weeks after the febrile period.

The Journal of Experimental Medicine.

September, 1924.

Rivers and Tillett describe the lesions produced in rabbits in their attempts to transmit Varicella. According to these authors the source and nature of the virus of chicken-pox have still to be determined but they conclude that the pathological changes produced by it are characteristic of the group of filterable viruses.

Heidelberger and Avery continue their investigations on the "soluble specific substance" found in filtrates from cultures of the pneumococcus. They urge that the specific substances of Pneumococcus Types II and III are really polysaccharide derivatives and that there is such a marked chemical difference between the soluble specific substances of these two types as to be of immunological importance.

Trask and Blake indicate the presence of a toxic substance in the blood and urine of Scarlet Fever patients. This evidence is gathered from a series of observations on persons who have not had Scarlet Fever being injected intra cutaneously with the blood serum and the urine of patients acutely ill with scarlet fever. They support the contention that scarlet fever is a local infection of the throat by a particular strain of Streptococcus haemolyticus.

North Manchurian Plague Prevention Service Reports.

1923-1924.

This valuable symposium edited by Dr. Wu Lien Teh is the fourth volume of a historic series. In his preface, Dr. Wu Lien Teh draws attention to the three cardinal virtues of the true scientist, and this record of work will prove a lasting memorial to his own "faith, perseverance, and originality."

The volume opens with a section on the plague epidemics of history. It is a most interesting survey of an astonishing number of outbreaks of pneumonic plague from the time of Justinian about 540 A.D. down to the present day. All literature has been ransacked and the compilation will be a mine of reference for future students of epidemiology.

A useful chapter describing the incidence of plague among the wild rodents was read at the Far East Congress of Tropical Medicine held at Singapore in 1923. Amongst the animals incriminated, the Tarabagan (Arctomys bobac) stands first in importance. The parasitic vector in this species is the Ceratophyllus silantievi.

The Section on Morbid Histology by Fujinami and Wu Lien Teh is beautifully illustrated with coloured plates and microphotographs.

Other chapters deal with the incidence of certain diseases in Chinese and Europeans, the construction and organisation of hospitals in China, and the status of medical education in China.

We congratulate Dr. Wu Lien Teh and his colleagues on the issue of a volume of high scientific value which will occupy a prominent position in the record of Medical Progress in China.

J. A.

BIOCHEMISTRY.

The Biochemical Journal: The Journal of Biological Chemistry.

Experimenting with rats on chronic anæmia, J. M. D. Scott has come to the conclusion that as an effective treatment of the disease, vitamin-rich fat must be given in connection with the administration of iron salts. *B.J. Vol. XVIII, No. 2.*

To ascertain the nature of urinary sugar, K. Tallerman has obtained results to show that the sugar excreted by normal persons and diabetic subjects appears to be the same that is, the *a-b*-variety but not the *y*-glucose which is the more reactive type, *B.J. Vol. XVIII, No. 3 & 4.*

W. K. Slater of Manchester has redetermined the heat combustion of Mytilus glycogen monohydrate in dilute solution to be 3836 calories per g. *B.J. Vol. XVIII, No. 3 & 4.*

The study of glycolysis under uniform conditions in normal men and diabetic patients by E. Tolstoi of New York shows that no diminution in the glycolytic power of diabetic bloods was found when compared with that of normals, both being kept at 37°C. *J.B.C. Vol. LX. No. 1.*

In a long article dealing with the acid properties of reduced and oxygenated haemoglobin, Hasting, Van Slyke, Neil, Heidelberger, and Harington of the Rockefeller Institute present results in perfect agreement with the conclusion reached by Reichert and Brown from crystallographic studies, that haemoglobins from different species are different substances. *J.B.C. Vol. LX. No. 1.*

Uric Acid: From an experimental study of the uric acid problem, O. Folin, H. Berglund, and C. Derick have elucidated several interesting points.

1.—The kidney is the chief organ for the absorption of urates.

2.—Other tissues are more or less completely impermeable to soluble urates.

3.—Destruction of urates takes place in the circulating blood.

4.—Some unknown oxidising agency contributed by some tissue—possibly the liver—is essential for the uric acid destroying process.

5.—In gouty subjects, the uric acid absorbing power of the kidney decreases and the uric acid in circulation consequently increases.

6.—Between the gouty and normal persons, there is no essential difference in the destroying process and the distribution of uric acid.

7.—The deposition of urates in gouty joints may be due to a slow diffusion of the urates into the cartilage and connective tissue. *J.B.C. Vol. LX. No. 2.*

R. F. Loeb, D. W. Atchley and E. M. Benedict have published experimental results which indicate that the urinary ammonia has its origin in the kidney. *J.B.C. Vol. LX. No. 3.*

Repetition of the work of Winter and Smith on the nature of blood sugar by W. Denis and H. V. Hume lends no support to the proof that *y*-glucose exists in normal blood. *J.B.C. Vol. LX. No. 3.*

In the electrometric determination of the hydrogen ion concentration of the human duodenum made by inserting an electrode through a fistulous opening, H. V. Hume and co-workers have obtained a maximum value of pH 8.23 and a minimum value of pH 5.90—an average of pH 7.02 from 182 readings under different circumstances. *J.B.C. Vol. LX. No. 3.*

Experimental results obtained by A. M. Daniels and G. Stearns on the mineral metabolism of infants show that infants who were fed with quickly boiled milk mixture retained considerably more calcium and phosphorous than those fed with pasteurized milk mixture.

The nutritive failures in the employment of evaporated milk seem to be due to the fact that the calcium salts are thrown out of solution by the heat treatment and thus made less readily available to animals fed with it. *J.B.C. Vol. LX. No. 4.*

S. Y. W.

RECENT WORK IN PHYSIOLOGY.

Sleep:—"Quarterly Journal of Experimental Physiology." Pavlov. Dec. 1923.

"American Journal of Physiology, Kleitman. Vols. 66 & 67.

The physiology of sleep, considering its importance in the maintenance of life processes—loss of sleep is more disastrous than loss of food—has not received the attention which its importance merits; it has been taken for granted. In the last number of the *Caduceus* mention was made of the work of Pavlov on dogs on the identity of sleep with inhibition considered as a general property of nerve "centres." Since then observations have been published by Kleitmann on experimental insomnia in man. Kleitmann reviews the various theories but comes to the conclusion as a result of his own observations that none of them pay sufficient attention to muscular relaxation as

a factor in inducing sleep. In his subjects sleep could only be postponed by walking about. As soon as the subject sat down he felt sleepy and during basal metabolism observations the greatest difficulty was experienced in keeping awake. This after all is a matter of general experience but we are indebted to Kleitmann for putting the observation on a scientific basis. It is, according to him, the complete absence of proprio-ceptive stimulation that leads to inactivity of the higher cortical centres and therefore sleep. After a very complete examination of blood composition using the latest methods he finds no evidence in favour of the "narcotic" theory of sleep. His work leaves the relation between fatigue and sleep which undoubtedly exists unexplained. He points out that even after prolonged insomnia up to 115 hours there is no evidence of a loss of efficiency in any but the highest cortical centres. There is, however, distinct evidence of an inherent rhythm of the nerve centres, the subjects of the experiment always feeling more sleepy during the night than during the day, which always brings some recovery though there has been no sleep during the night before.

All this points to the conclusion that sleep in the higher animals is essentially a cortical or conditioned reflex, involving an inhibition of the higher nerve centres.

Fatigue, monotony, and absence of stimulation such as occurs on lying down with muscles relaxed in a dark, quiet room, are the main contributing factors. Sleep is simply another example of the integration of bodily activities through the cerebral cortex. It is essentially a cortical condition but through inhibition of cortical activity, the whole body is rested and the rest period controlled and co-ordinated for the well being of the organism as a whole.

The Conduction of the Nervous Impulse.

"The Conduction of the Nervous Impulse" by Keith Lucas. 1917. (Longmans), London.

"The Theory of Decrementless Conduction in Narcotised Region of Nerve" by Genichi Kato. 1924. (Nankodo), Tokyo.

It was Sherrington who first taught us to think clearly with regard to the functions of the nervous system and to show us that the key to the situation is a clear knowledge of nerve paths and nerve conduction. He pointed out, however, that conduction in the central nervous system is distinguished by certain features which appear to be absent from the peripheral nerves, such as

delay, summation, fatigue, block or resistance, facilitation, inhibition. These special properties had been previously attributed to the nerve cell as distinct from the nerve fibre, until Sherrington placed them in the synapses "between" the neurones.

Lucas then took up once more the conduction of peripheral nerve and though owing to his premature death he was unable to complete the work, he was coming to the conclusion that there is no fundamental difference between central and peripheral conduction, and that such differences as exist are differences of degree. The starting point in these researches was the adoption of a special method for measuring the strength of the nervous impulse. It had been shown by previous observers that narcotics acting on nerve trunks abolished conductivity, not only in proportion to their strength but also in proportion to the length of nerve narcotised. On repeating these experiments Lucas concluded that the strength of a nervous impulse could be measured in terms of its ability to pass through a narcotised region. The stronger the impulse the longer was the length of narcotised nerve necessary to extinguish it. The view was advanced that on entering a narcotised region the energy of the impulse is progressively reduced and the region was spoken of as a region of decrement. It was further stated that the natural synapse may also be regarded as a region of decrement. All this work has been recently repeated by Dr. Genichi Kato, Professor of Physiology and Director of the Physiological Institute, Keio University, Tokyo, and published in a monograph a copy of which reached the School of Physiology a short time ago. He has been able to use for his experiments a very large toad (Bufo Vulgaris Japonicus) from which greater lengths of nerve can be obtained than in Lucas and Adrian's experiments. He claims to have shown that whereas a narcotic reduces the activity of a nerve trunk both as regards the intensity of response and the rate of conduction, there is no progressive decrement, the energy of the response being the same at the end of the narcotised length of nerve as at the beginning. Both the intensity and rate can be further reduced by increasing the strength of the narcotic and the impulse finally extinguished, but there is no progressive extinction and therefore in the sense in which Lucas used the term, no decrement. He therefore advances a " theory of decrementless conduction in narcotised region of nerve " and that is the title he gives to his monograph. Lucas view has been very widely accepted and we shall await the reply of Adrian and others to the work of Dr. Kato with great interest. For, this point is fundamental to our knowledge of the nature of the nervous impulse and its conduction throughout the nervous system. And after all, is not our life controlled by nervous impulses?

H. G. E.

GENERAL.

The Unison. Vol. 1.

A casual glance over this publication of the Peking Union Medical College tempts one to form of it the impression of a "pictorial review." The portraits of the important personages of the institution are undoubtedly abundant! A careful survey, however, enlightens the reader on various points, viz., the excellent staff of the College, the well-equipped departments with attached laboratories, and the facilities provided for research. The appropriate history of the College at the beginning of the book tells of the humble beginnings of the College from the Medical Training Schools of the London Missionary Society and of its rapid development through the unlimited support of the Rockefeller Foundation, into one of the best Medical Colleges of China. The most interesting part of this work deals with the students, who are perhaps a little too eager to "recall and record" the eventful deeds of the year. The various classes with their inspiring mottos and photographs, and the accounts of their social and athletic activities give the reader an insight into the real life of the College. The value of this book lies in the fact that no details are considered too small to be recorded, and it is not to be wondered that a copy of the record of health habits for individual students relating to personal cleanliness, neatness of appearance including the cleaning of finger-nails, the time when hands should be washed, baths taken, and teeth brushed, etc., is also inserted. Such instructions are without doubt of great benefit when given to school boys of uncertain habits, but to College students, some of whom are perhaps parents of healthy children, it is difficult to comprehend the benefits derived from them, unless we draw the unpleasant inference that the students of the College are little above school boys. On the whole, the book is well compiled and well illustrated and the members of the first graduating class of the College, for whom it is primarily intended as a souvenir, ought to be proud of it.

Y. K. C.

News And Comments.

Medical Library.

At last the partition which was proposed by the Library Committee as far back as 1922 has materialised and the Faculty can now boast of a real library instead of half a room where book cases may be housed.

The panelling of the partition is undoubtedly good but it would have been better if it had not been cut across by the gallery.

We understand that the gallery will be used for more valuable reference works including the bound volumes of the journals. We are not sure whether we like the imitation marble panels and think perhaps glass might have been better. Further the ornamental iron work is by no means ornamental. However, we carp—the essential fact is that we have at last got a library of our own and *that* is a real addition to the Faculty; for it stands for independent reading and research and no Faculty can be built upon teaching and text books alone. We shall certainly require more fans next summer and all the windows should be made to open, but for the present the library is already beginning to acquire that atmosphere which is so conducive to study, though the chairs perhaps err on the side of being too comfortable.

Professor of Physics.

At last we have got a Professor of Physics. We are grateful to Profs. Brown, Byrne and Roffey for carrying on and especially to Mr. Un Po for his conscientious work in maintaining what may be termed the continuity of the department. But we offer a most hearty welcome to Prof. Faid who comes to us with a good reputation from the University of Durham. We hope he will recognize that Physics is an integral part of Medicine and will impress on the students the necessity of a sound knowledge of physical principles if they are to understand physiology and engage in rational therapeutics. Chemistry is usually considered to be of more importance than Physics in the medical curriculum, whereas the converse is considered true for the student of engineering. But the work of the last 20 years has shown that there is a biophysics as important as biochemistry and that it is impossible to form any conception of the ultimate significance of biochemical reactions without a knowledge of biophysics. This is especially illustrated by the recent work of Prof. A. V. Hill and his pupils on the nature of muscle activity. It is interesting to note in this connection that the Professor of Physiology at Newcastle, Dr. David Burns, has already written a book on biophysics, as applied to the study of human physiology.

Dr. S. Y. Wong. We are also glad to welcome, Dr. S. Y. Wong as assistant to the Professor of Physiology. Dr. Wong is exceptionally well qualified, having spent five years in the department of Biochemistry at P.U.M.C. and having recently taken his Ph.D. degree at Columbia by research. We hope that before long we shall see a new department of Biochemistry and Pharmacology which is very badly needed to make the Medical Faculty complete on the preclinical side.

Prof. Byrne. We shall be pleased to see Prof. Byrne back at the end of the present term. He is a good teacher and judging from entries in the register of the medical library keenly interested in the application of Chemistry to Medicine.

Prof. Wang. Prof. Wang will we hope be with us shortly after the Chinese New Year holiday. It is a matter of great regret that he will not be back in time for the C.M.M.A. Conference, but with a University like Hongkong somebody is always on leave and it is seldom if ever that we can command a full staff for any length of time.

Biology. We are sorry Mr. Barney is not returning. He was a good teacher and was very much liked by all the students. In this respect he will be difficult to replace.

We hope, however, the University will take advantage of the opportunity afforded by the vacancy to place Biology on the same footing as Chemistry and Physics. At present Biology is housed by courtesy of the Professor of Medicine in the School of Tropical Medicine, and he will certainly soon require the space occupied for his own department.

Biology was turned out of the main building to make room for the growing departments of Physics and Chemistry. Perhaps with the building of the new engineering workshops, space may be found once more for Biology in the main building.

But a modern university without a department and Chair of Biology is an anomaly and we hope the University will be able to find a benefactor who will enable us to place this fundamental subject on a proper basis.

Rockefeller Chair of Obstetrics.

We are now in a position to announce the appointment of Dr. Tottenham to the Chair of Obstetrics and Gynaecology endowed by the Rockefeller Foundation. After some preliminary studies of the unit system in Great Britain and the methods of teaching in the United States, Professor Tottenham should arrive in Hongkong some time during the Spring Term. He comes to us from the home of obstetric teaching and research, namely the Rotunda Hospital, Dublin; so that he comes fully equipped for what will no doubt prove a somewhat formidable task in Hongkong, the building up of a really first class Maternity Clinic. In previous issues we have called attention to the importance of the work of this chair as an integral part of preventive medicine, especially when it is taken to include prenatal and post natal care of the mother and child. Good work has already been done at the various maternity hospitals in the Colony, as well as by Mrs. Hickling on the district.

It will, however, be a great thing if all this work can be co-ordinated from a scientific point of view, and investigations carried out into difficult cases and conditions.

Dr. Forsyth. It was a matter of great regret that Dr. Forsyth had to resign his lectureship prematurely. We hear that since his arrival in Canada his health has greatly improved and we trust he will soon be able to appreciate the benefits of a well earned retirement.

Dr. Forsyth had lectured on Obstetrics ever since the foundation of the University and before that at the Hongkong College of Medicine. He was always most popular with the students and undoubtedly possessed the teaching gift in no small degree.

We have been very fortunate, however, in securing the services of Dr. Arthur Woo, who was assistant to Dr. Preston Maxwell in the Gynaecological Department of the P.U.M.C., to carry on until Professor Tottenham's arrival.

Dr. Koch. We also regret that another member of the teaching staff of the Hongkong College of Medicine has left us. It was hoped that Dr. Koch would have been able to carry on till the end of the year, but pressure of work made it necessary for him to resign in September. Like Dr. Forsyth, Dr. Koch was a good teacher and several generations of students owe a great deal to his lectures in Surgery.

We are very grateful to Dr. Gibson who has again come to the rescue and is carrying on this work.

The retirement of Dr. Forsyth and Dr. Koch and the assistance of Dr. Gibson should remind us that the present Faculty of Medicine, not to say the whole University, really owes its origin to the work of the local profession who founded and carried on for 25 years the Hongkong College of Medicine.

The creation of chairs in clinical subjects and the appointment of whole time men was the necessary outcome of the absorption of the College into the University Faculty and of the general trend of modern medical education. However, as was pointed out, when the new scheme was first brought forward, medical education will always require the help of the part time teacher, for it is he who forms the link between the University Faculty and the general public for which the Faculty ultimately exists and to which through its graduates it must look for continued support.

Hon. Dr. A. L. Hoops and the Singapore Medical School.

We were glad recently to receive a visit from the P.C.M.O. of the Straits Settlements and to hear something of the plans for the King Edward VII. Medical School at Singapore. It appears that they contemplate in the immediate future various additions to the staff in the shape of a Biochemist and Helminthologist, and it is possible that with the opening of Raffles College, it will not be long before the Singapore Medical School becomes the medical faculty of a "Straits" university. Under these circumstances we must expect to see a decrease in the numbers of our Straits students. Although this may seem at first sight a matter for regret, we should not be slow to see the greater value of a new university centre in a neighbouring colony —for our ultimate aim is not so much the development of one centre to the exclusion of others but the general spread of medical knowledge throughout the Far East.

Graduate News.

Dr. S. N. Chau writes to tell us of his doings in London. He has been very busy at the Royal London Ophthalmic Hospital and also at the Central London Hospital for diseases of the Ear Nose & Throat. He finds that he has a great deal to learn in these subjects and is inclined to criticise the facilities for studying these subjects in Hongkong. It is, however, rather illogical to expect the same educational facilities in a University just over ten years old as are found in London. No doubt when in the future the centre of the world shifts eastwards and we are as "old" as London we shall not be found lacking.

Dr. M. K. Yue is more constructive in his criticisms, and is thoroughly enjoying his new experiences. He was impressed by his stay in the Straits, and suggests it is high time the "Caduceus" had an agent there for distributing the journal and collecting subscriptions. Certainly something should be done, since one of the chief objects of founding the journal was to link up the "scattered" graduates with each other and with the work going on at their University.

Dr. Yue has now gone to Cambridge where he is taking the D.P.H. course. We are confident that he will do a great deal to foster that interest of the "home" universities which is so important if we out here are to carry on as their oversea representatives.

We received news from Dr. W. H. Shih, who graduated from this University two years ago, informing us of his post-graduate appointment in Taheiho Hospital, Manchuria, where he spent a year of fruitful work. We congratulate, him on his recent appointment as Port Health Officer of An Tung, North China.

The following reports of our two future assistants in Surgery, and Obstetrics and Gynaecology have been kindly supplied us by the Dean of the Faculty:—

Dr. S. W. Phoon, M.B., B.S.

Awarded a Rockefeller Travelling Fellowship for 12 months as from 1st April, 1923, and subsequently an extension for eight months, and a further two months extension to enable him to arrive in the Colony on or before 1st March, 1925. Expected to be appointed Assistant to the Professor of Surgery.

In London, had nine months under Mr. Trethowan of Guy's Hospital studying orthopaedics, and three months in general accident and casualty work under Mr. Choyce's supervision. From October to February, he will be working under Dr. Royal Whitman at the Hospital of Ruptured and Crippled in New York.

Dr. D. K. Pillai, M.B., B.S., L.M.

Awarded a Rockefeller Travelling Fellowship for 12 months as from 1st September, 1923, and subsequently an extension for three months and a further three months extension to enable him to arrive in the Colony on or before 1st April, 1925. Expected to be appointed Assistant to the Professor of Obstetrics and Gynaecology.

In London, had two months with Sir George Blacker of University College Hospital. In Dublin spent six months at Coombe's Lying-in Hospital and subsequently obtained the L.M. Stayed in Vienna for two months but was advised to spend the rest of the fellowship in Zurich under Professor Walthard of Frauenklinik, to the end of the year. He might perhaps return to take up his duties here via America.

Acknowledgments.

We beg to acknowledge receipt of the following contemporaries:—

St. Mary's Hospital Gazette.

The China Medical Journal.

Sixteenth Annual Report of the Peking Union Medical College Hospital.

Scholarships.

Blake		Dr. T. Y. Li
Ho Fook		Dr. S. C. Chia
Jordan		Dr. T. L. Cheah
Ng Li Hing and Chan Kai Ming	May 1923 ..	Mr. Oo Chong Siah
	May 1924 ..	Mr. S. C. Kwong

Appointments.

Post. Gradnate

House Surgeon	Dr. Chia Shi Ching
House Physician	Dr. T. Y. Li
Clinical Assistant to Surgical Unit...	Dr. M. B. Osman
Clinical Assistant to Medical Unit..	Dr. Cheah Toon Lok
Clinical Assistant in the Out-patients Department and Assistant Anaesthetist. ...	Dr. S. A. M. Sepher

July to September.

Surgical Ward Clerks. - - - - - -	Mr. J. C. Chan
	„ K. K. Kawn
	„ H. K. Pang
Surgical Dressers. - - - - - - - -	Mr. H. K. Lung
	„ H. S. Teh
	„ A. D. Wong
Junior Medical Ward Clerks - - - -	Mr. S. C. Kwong
	„ J. S. Guzdar
	„ T. S. Tsoi
Senior Medical Ward Clerks - - - -	Mr. K. T. Teo
	„ F. C. Tsang
	„ W. Yuen

Obstetrics - -	Mr. C. F. X. da Roza.	
	„ F. I. Tseung.	
	„ K. C. Yeo.	
Pathology Clerks	„ C. C. Cheah.	(July to August)
	„ A. Shem.	(July to August)
Anaesthetic Clerks	„ Y. K. Wong.	(July to August)
	„ B. C. Lee.	(August to September)
	„ K. K. Yip.	(September to October)

October to December.

Surgical Ward Clerks -	Mr. T. Z. Bau.
	„ J. S. Guzdar.
	„ S. C. Kwong.
Surgical Dressers - -	„ J. C. Chan.
	„ K. K. Kawn.
	„ H. K. Pang
	„ F. C. Tsang.
Junior Medical Ward Clerk	„ C. S. Oo.
Senior Medical Ward Clerks	„ H. S. Teh.
	„ T. S, Tsoi.
	„ A. D. Wong.
Obstetric Clerks - -	„ H. K. Lung.
	„ K. T. Teo.
	„ W. Yuen.
Anaesthetic Clerks - -	„ K. C. Yeo. (Oct. to Nov.)
	„ C. F. X. da Roza. (Nov. to Dec.)
	„ F. I. Tseung. (Dec. to Jan.)
Pathology Clerks - -	„ B. C. Lee. (Oct. to Nov.)
	„ F. I. Tseung. (Oct. to Nov.)
	„ K. C. Yeo. (Dec. to Jan.)