

THE CADUCEUS

JOURNAL OF THE HONG KONG UNIVERSITY
MEDICAL SOCIETY.

Vol. 18

November, 1939.

No. 4

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," Hong Kong University, Hong Kong.

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

A REVIEW OF IMMUNITY IN BACTERIAL INFECTIONS,

by

R. Cecil Robertson,

Department of Pathology, The University, Hong Kong.

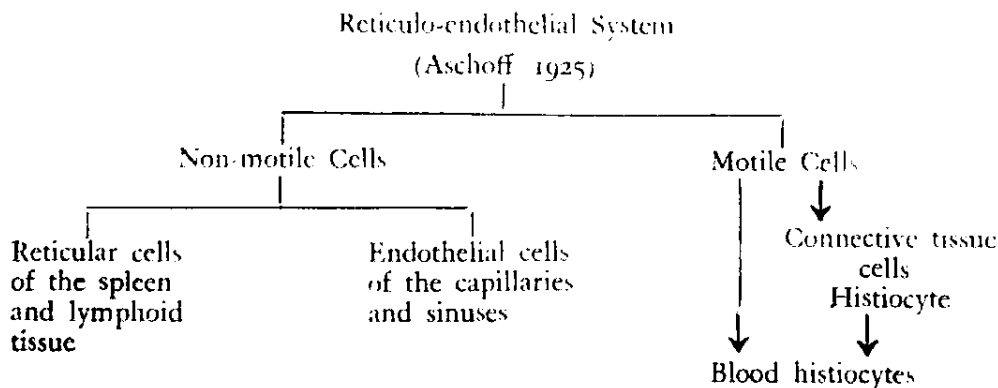
I. CELLULO-HUMORAL IMMUNITY

(a) THE RETICULO-ENDOTHELIAL SYSTEM AND THE PRODUCTION OF ANTIBODIES.

(b) THE ANTIBODIES IN RELATION TO IMMUNITY.

II. LOCAL TISSUE IMMUNITY.

In discussing the problem of the resistance of the body against bacterial infection in the light of modern conceptions; one has to take into due consideration that unit of the cellular structure of the body which is now called the reticulo-endothelial system. The existence of such a system is not a mere convenient hypothesis: it is a real fact. It is just as physiologically important to the body as the lymphatic system or the endocrine system. Although it includes a range of cellular elements which have a wide distribution in the body, yet these cells all function in the same manner like a single physiological unit. Therefore, for all practical purposes it can be considered as a single structure. There is only one organ in the body which contains a very large aggregation of reticulo-endothelial tissue, that is the spleen. The rest of the cells of the system are found in the bone marrow, liver, lymph glands and connective tissues. The table shown below gives an idea of the cellular elements which constitute the system as a whole.



It has been known from the time of Metchnikoff that in cases of infection these cells in the reticulo-endothelial system which were called by him macrophages have the particular function of clearing up the micro-organisms from the blood circulation by the process of phagocytosis. Since that time evidences have been accumulated to show that this system is not only concerned in phagocytizing bacteria but it also destroys bacteria and produces antibodies to them and their toxins. The numerous studies that have been carried out, with the exception of a few minor discrepancies, all well confirm these points. At this juncture it will be convenient for us to consider a few of the attempts that have been formulated to demonstrate the relation of the reticulo-endothelial system to the formation of antibodies. Experiments on this problem utilized the fact that splenectomy would remove the largest single aggregation of the reticulo-endothelial tissue from the body, and the function of this organ in relation to antibody formation would be determined by seeing what happened to the body after its removal. But a simple splenectomy would not exclude more than a part of the system, so in addition to this operation a process with the object of paralysing all the cells in the system was devised. This process is called reticulo-endothelial blockage. It is performed by injecting dyes such as trypan blue and Indian ink into the blood stream of the animals to be tested. After repeated injections of the dyes, the cells in the system are all engorged with the dye particles so that there is no more room in the cells for ingesting further matter than what they have already taken in. Aided by these two methods, splenectomy and blockage, the determination of the role played by the reticulo-endothelial system in the production of antibodies is rendered possible. Studies were mostly made on rabbits in which splenectomy or blockage, or both have been performed. Antibodies were determined after injecting the antigens in both the treated animals and untreated controls. And the reports from these experiments fall into two groups. Thus the ability of the reticulo-endothelial cells to form antibodies was reported by Murata; Gay and Clark; Siegmund; Isaacs; Beiling and Isaacs; Kahayashi and Shiwotsu; Okada; Stewart and Parker; Jungeblut and Berlot; Vannucci; Cionini; Roberts; and by Cannon, Baer. Sullivan and Webster, whereas lack of evidence of such ability was reported by Rosenthal; Moses and Petzal; Frankel and Grunberg; Standenath; Weiss and Kunzi; Howell and Tower; Lewis and Loomis; Ross; Collen; Benassi; Lacassagne and Paulin; and Simitch. Aware of the considerable failures of the previous workers, Tuft (1934) very accurately conducted a series of experiments. He made a variation in the antigens and the blocking materials so as to render this much more effective. A larger number of experimental animals were used to obviate individual variations. The blockage was efficient and the production of agglutinins in rabbits against *B. typhosus* and *B. para-typhosus* A and B prevented. Thus he concluded that

the importance of this system in the production of antibodies is evident from the result of his experiment.

By an entirely different line of attack, Meyer and Löwenthal in 1928 recorded results on the production of the antibodies by tissue culture of the endothelial cells of the milk spots from the omentum. Inside the culture of these cells from the omentum we are concerned with the mere presence of the reticulo-endothelial cells, many other unknown factors which can not be controlled in experimental animals are excluded by applying this method. It, therefore, appears to be a very promising means of solving the problem.

To sum up, it seems that the present situation is that all the literature upon the problem agrees that there is every reason to suppose that the reticulo-endothelial system is responsible for antibody formation but proof of this in any concise and convincing form is as a whole lacking. The method of reticulo-endothelial blocking has been blamed as an insufficient weapon for the solution of the problem because the various blocking agents vary in their behaviour in that some of them, such as trypan blue are found to stimulate antibody formation, while others like Indian ink inhibit their production. So long as the technical details of this method are not well mastered, we can not have a clear cut answer to the question.

The next question, which naturally arises, is; what role do these humoral antibodies play in the mechanism of resistance to infection in immunized animals. It is a question which has been controversial for the past 40 years and yet for the greater part remains unsolved.

Immunity is usually divided into two types, viz., antitoxic and antibacterial. For anti-toxic immunity the answer to our question is simple. The action of an anti-toxin against a toxin is specific and the active antibodies can be produced by immunizing animals. Its prophylactic and curative action are well and easily demonstrable. The neutralization in vitro of the anti-toxin with a toxin is also well in keeping with the protective effects in vivo.

In the case of anti-bacterial immunity the position is far less clear. The results from the various investigations on this problem show many divergent views. It is a known fact that immunization with bacterial antigen does lead to the appearance of sensitizing antibodies in the blood, as well as of the property of conferring passive immunity. Therefore inquiries were made by various workers to determine the degree of correlation between these two phenomena. This was usually obtained by comparing the frequency distribution of the power to agglutinate or opsonize, and the power to protect. In the hands of Wadworth and Avery, and Wright (1927) they failed to find any correlation between the power to agglutinate and the power to protect in anti-pneumococcal sera. Recently Teale (1935) reported his

work on streptococcus and *B. anthracis* in which he found that the immune animals can resist the infection from the peripheral circulation very promptly without showing any agglutinins in the blood or any general germicidal power of the blood and protective antibody for conferring passive immunity.

Of course, one has to remember that protective effects may constitute only one factor among many which determine resistance. The type of infection, the virulence and the dose of the infecting bacteria all have a part in estimating the degree of protective action of a serum. And further more, as it has been suggested by Wright that the *in vivo* test is more sensitive than any carried out *in vitro*. All these factors probably constitute the possible reasons explaining why it comes about that results are positive in demonstrating protective power in the serum and negative in determining the presence of the sensitizing antibodies in the same.

With the newer knowledge about the specific substance of pneumococcus, Avery and Heidelberger have succeeded in demonstrating that the agglutination, precipitation, and protective power are related to an antibody in the immune serum. In this case there is no room for doubt but that the antibody which determine agglutination or precipitation in the test tube is the same kind of antibody which plays the main part in determining passive protection in mice, because the antigen of the pneumococcus is prepared in a chemically pure form and has the constitution of a complex polysaccharide. However it would be unwise to generalize on the basis of such limited data. Topley and Wilson think that it seems reasonable to believe that different sensitizing antibodies, acting on different antigenic constituents of the same bacterial cell may have unequal protective value in the animal body. The union of one antigen with its corresponding antibody may render the bacterium powerless against the resisting mechanism of the host while the union of another antigenic constituent with its specific antibody may have little or no effect.

II. LOCAL TISSUE IMMUNITY.

In contradistinction to the cellulo-humoral theory for the explanation of immunity phenomena, we have the local tissue immunity theory advocated by the school of Besredka. The first example which he used to support his views was with regard to anthrax. He thought that the skin alone is susceptible to infection with anthrax, and as long as the continuity of the integument is not disturbed the whole body is immune. Balteano and also Plotz are said to have confirmed his views by animal experiments. But by injecting the *B. anthracis* through different routes, Murata found that the intramuscular route is the most susceptible one, and the intravenous and the intraperitoneal routes are the least, while the intracutaneous and the subcutaneous

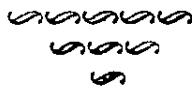
stand in an intermediate position. Since all the injections have to go through the skin, the differences of susceptibility to infection by the various routes should not exist. Müller also recorded results which are directly opposed to Plotz. He inoculated *B. anthracis* into an egg, and later discarded this for a well sealed Berkefeld candle. These containers loaded with *B. anthracis* were implanted into the abdominal cavity of rabbits. The operation wounds healed up perfectly well but the animals died several weeks afterwards of anthrax infection. The other example which Besredka upheld as an evidence of local immunity is the work on experimental erysipelas. It has been commonly noted that a previous percutaneous inoculation of streptococcus erysipelas would produce resistance to the subsequent injection of the same organism. However it was found that this localized immunity would not ensure general immunity. Thus Gay and Rhodes, and Amoss and Bliss have shown that an intravenous injection of *B. anthracis* to the animal in which the skin has been immunized the infection. And it was only after a prolonged immunization of the skin that a generalized humoral immunity was developed. Mallory and Marble have further proved that the localized immunity not only can be produced by the specific antigens but it can also be brought about by any non-specific substances such as sterile broth.

A conclusion was well drawn by Topley and Wilson in their discussion of this problem. They said that it is generally believed that there seems to be some support for the view that a local tissue immunity as opposed to a general humoral immunity plays some part in the resistance to bacterial infection. It would seem, that this local immunity is of a kind very different from that postulated by Besredka. It seems far more likely that the increased local resistance is due to entirely non-specific factors, such as altered structure and cell contents of the tissues resulting from an inflammatory reaction of a particular type. Such localized tissue immunity does not usually confer general immunity. When local immunity is pushed to the point at which general resistance is markedly increased, it is possible to demonstrate the presence of protective antibodies in the blood.

REFERENCES.

- | | |
|-------------------------------------|---|
| BESREDKA, A.(1930) | <i>Immunity in Infectious Diseases</i> , London. |
| HADFIELD AND GARROD(1932) | <i>Recent Advances in Pathology</i> , London, p. 1-33 |
| KOLLE AND HETSCH(1934) | <i>Experimental Bacteriology</i> , London, p. 93-99. |
| MEDICAL RESEARCH COUNCIL(1931) | <i>A System of Bacteriology</i> , London, Vol. 6, p. 60-71. |

- TEALE, F. H.(1935) Some observations on the question of the various manifestations of antibody activity being due to separate antibodies of an immune substance acting differently under various conditions; *J. Immunol.*, 28: 241.
- (1935) Some observations on the relative importance of the reticulo-endothelial tissue and circulating antibody in immunity; *J. Immunol.*, 28: Part I, 133-160.
- (1935) *Ibid.*, 28: Part II, 161-182.
- TOPLEY AND WILSON(1931) *The Principles of Bacteriology and Immunity*, London, Vol. II, p. 661-688.
- TUFT, L.(1934) The Effect of Reticulo-endothelial cell blockade upon antibody formation in Rabbits; *J. Immunol.*, 27: 63.
- ZINNSER, H.(1931) *Resistance to Infectious Diseases*, Boston.



A SPECIMEN OF A SKULL FROM LAN TAU
SHOWING TREPHINING,

by

L. R. Shore,

Department of Anatomy, The University, Hong Kong.

The specimen to be described was reconstructed from a number of bone fragments collected by Mr. W. Schofield, lately First Magistrate of Hong Kong and well known archaeologist, on the island of Lan Tau which lies in the West of the Hong Kong archipelago.

The point which has prompted this communication is the presence in the skull vault of a round hole which conveys every suggestion of trephining. In view of Mr. Schofield's opinion that the skeletal remains found on Lan Tau are the earliest human burials yet found on the South China Coast, this finding acquires a special interest.

The site on which Mr. Schofield and his colleagues had been excavating from the latter end of 1936 is called by them the "Shek Pek" site, named after the small village nearest to the excavation.

The chief findings from the archaeological standpoint have been communicated by him to the Troisième Congrès des Préhistoriens de l'Extrême Orient held at Singapore in January, 1938, but not yet published.

The Shek Pek site is in the sand dunes that lie some quarter of a mile or more above tide level near the foot of some steepish hills. A rich collection of archeological treasures has been found.

The skull fragment shown in the figures was brought to the Anatomy School in small pieces, dry and encrusted with sand. In the laboratory the bone was so friable that it was a matter of great difficulty to preserve as much as has been done. When bone fragments were unwrapped, some fell into powder in spite of great care, but other fragments were sufficiently coherent to allow of impregnation with gum and reconstruction when firm enough to handle.

The parts of the skull which have been re-assembled include both parietal bones, a small part of the left frontal, nearly all the left temporal and the upper part of the occipital. The skeleton of the face is entirely missing, and so is the base of the skull and the mandible. The left half of the skull is more complete than the right. No other parts of the skeleton were recovered.

The figures, which are drawn to scale by means of the dioptograph, both show some lack of symmetry in the skull vault after reconstruction. Whether distortion is the effect of faulty reconstruction under circumstances of some difficulty, or whether distortion

had taken place before excavation must remain uncertain. It may be remarked that certain other skull bones recovered from the Shek Pek site have been flattened and the normal curvature almost lost, showing that the pressure of wet sand in the course of time can indeed bring about distortion of skull bones without their disintegration.

Figure I is a dioptograph drawing of the reconstructed skull vault viewed from the vertex. This view gives an impression of a wide and short skull, and the side view shown in Figure II gives an impression of height.

A very rough estimate of the probable length of the skull is 16.5 cm., and of the greatest breadth 14 cm.; of these the second figure is probably the more reliable. A cranial index deduced from these figures points to brachycephaly with a value of about 85. The height index might be about the same, for though the height cannot be measured, by inference it can scarcely have been less than 14 cm. The indices of a modern Chinese skull might well correspond with these.

The skull vault gives no certain indication of the coronal suture or of the point bregma, though from the vertical view one would have expected both of these to have been included in the fragment. The inference, assuming that reconstruction is reliable, is that the individual from whom the skull was derived was of advanced age, certainly of over 45 years, judging by European standards. The indications of sex in a skull are often uncertain, but the male is rather indicated by the prominence of the mastoid process and of the ridges for muscle attachment on the occiput.

The hole, indicated by a cross in both drawings, measured from its nearest point is situated 2.6 cm. from the sagittal suture, 4.3 cm. in front of the lambdoid suture and 4.4 cm. from the point lambda.

Though not absolutely complete, the hole is evidently circular. The edges are clean cut and sheer, perpendicular to the surface. The internal diameter of the hole is almost exactly the same as the external, namely 2.1 cm. The circular shape and the sheer walls suggest that a drilling process has been employed. A critic's suggestion of a recent interment of a casualty from a bullet may be easily dismissed. The site was undisturbed by recent digging. Other skull fragments from the same site are in a comparable state of disintegration with this, and must belong to a similar era. There has been no splintering of the inner table of the skull or "spread" as would be expected from a bullet, also the axis of the hole passes through the left petrous bone which is undamaged.

As regards a pick: Mr. Schofield's technique of excavation is one of scraping with a trowel, and he positively avers that no pick or other tool capable of making a cylindrical hole was included in his outfit.

It seems then almost certain that the hole in the skull is the result of deliberate and skilful craftsmanship, and not the result of any ordinary injury.

The surface of bone exposed in the hole is not different from that exposed in other regions of the skull. The cancellous spaces of the diplóe seem to be normal without evidence either of absorption or of new bone formation. It is, of course, well accepted that reparative callus is not produced by the bones of the skull vault. So there is no evidence to be gleaned from the specimen to show if the patient died as a consequence of the operation, if he recovered or indeed if the operation were not performed post-mortem.

As to the reason for the trephining, we are still more thrown back on conjecture. The site of operation does not correspond to any ordinary procedure of modern curative surgery, or to any region which admits of exact localization in terms of function, being over the posterior parietal area. Of course, these considerations do not rule out the possibility of an operation with a definite therapeutic object. Alternatively, the purpose may have been sacrificial.

Unfortunately, in Hong Kong there is no opportunity of making comparison with trephined skulls from other parts of the world, but the writer is left with the impression that the technique of early trephining is one of scraping rather than of drilling. It is this technique which lends this specimen much of its interest.

As regards the probable date of the interment, Mr. Schofield in a letter gives an estimate which is based on evidence which is partly geological and partly cultural.

"Sung dynasty cash of 1106 A.D., possibly buried about 1300 A.D. as it is somewhat worn, was found lying flat beside pottery of uncertain age, indicates by its depth of 18 cm. below the surface of the sandbank a rate of sand accumulation of about 3 cm. a century.

"If we assume that a corpse would, like modern corpses, be buried at least 25 cm. below the then level of the bank, then as the present ground level is 15 cm. below the zero of the excavation and the skull lay at 111 cm., the accumulation would amount at most to 111 - (15 + 25) = 71 cm. This gives a maximum age of $71/3$ or roughly 24 centuries since the burial.

"Allowing 6 cm. extra depth for crushing and collapse of the skull, 22 centuries is more probable, which gives a date in the neighbourhood of 250 B.C."

It may be remarked that 25 cm represents a distinctly shallow grave, and the date of the interment may have been later; however, it seems to be established that trephining by a drilling procedure was practised in the China Coast at or before the Christian era. Perhaps

some archaeologist or surgeon with a knowledge of the surgical procedures peculiar to China may be in a position to comment on this specimen.

So far, fragments of 6 skeletons have been found at the Shek Pek site, all in a very bad state of preservation, and in three cases consisted of no more than the skull cap and a few teeth.

The skull of which the fragment is described lay on its cap apparently face upwards close to the edge of the sand cliff in a long axis approximately North-South, with the feet to the North. That no other bone was associated with it may possibly be explained by the presence of a small occasional stream that cuts through the back of the bank, and might have washed away other remains.

The articles associated with this skull fragment include a "T" section agalmatolite or jade ring lying flat 50 cm. to the North of the skull.

It may be that the ring had laid on the chest of the skeleton. Mr. Schofield comments on the Chinese custom of burying a ring on the chest of the dead. If this be a true and not a chance association, any doubt of the technical skill of the former inhabitants of Shek Pek contemporary with this skull is quite dispersed, and it is clear that they were masters of a highly developed culture.

On this site have been found moulds for the casting of bronze axe heads, ornaments of various stones turned and polished with great skill and artistry, stone adze heads, stone spear heads, pottery of many varieties and human remains in the deeper layers. Soft iron bars were found near the surface. It seems that the site was occupied by generations of craftsmen who manufactured tools, weapons and ornaments, and was not only their factory but also their burial site, covering a period when stone gave place to bronze and bronze to iron.

In preparing these notes I wish to thank Mr. Schofield—not only for the interesting material he brought me for examination, but also for the very interesting meetings at which he showed me the archaeological treasures derived from the Shek Pek site.

I have not forgotten the delightful expedition of several days duration in Mr. Schofield's company at Lan Tau. In a complete ignorance of the archaeological aspects of the crafts of the South China coast I have avoided all comment, and have preferred to use Mr. Schofield's own words and deductions, in anticipation of his permission to quote them in this place.

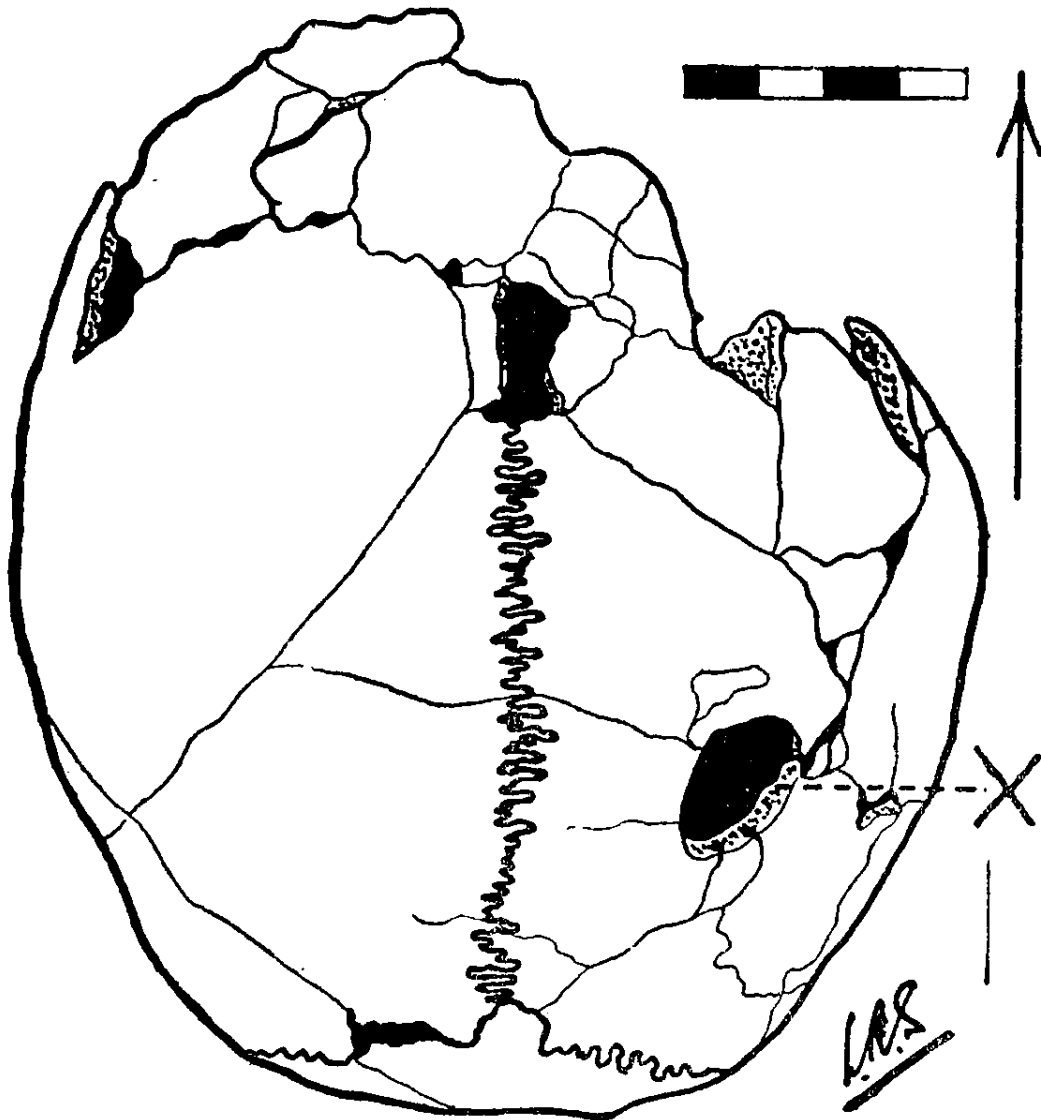


FIG. 1.

The reconstructed skull vault has been orientated in, as nearly as may be judged, the Frankfort horizontal position. A drawing has been made in *norma verticalis* by means of the dioptograph. The pointer is directed to the front, and the size in centimetres is shown by the scale above. The finer lines indicate the outlines of individual bone fragments and stippling indicates exposed diploë. On the right side towards the posterior part of the parietal bone is the circular hole marked X which is thought to be the effect of trephining.

The sagittal and lambdoid sutures are shown traversing the middle and the posterior part of the skull vault. The reconstruction gives no indication of the coronal suture or of the point bregma. It may be noted that the sagittal suture is incomplete at its anterior end; possibly this is at the point bregma and the coronal suture may have been obliterated by synostosis and become untraceable.

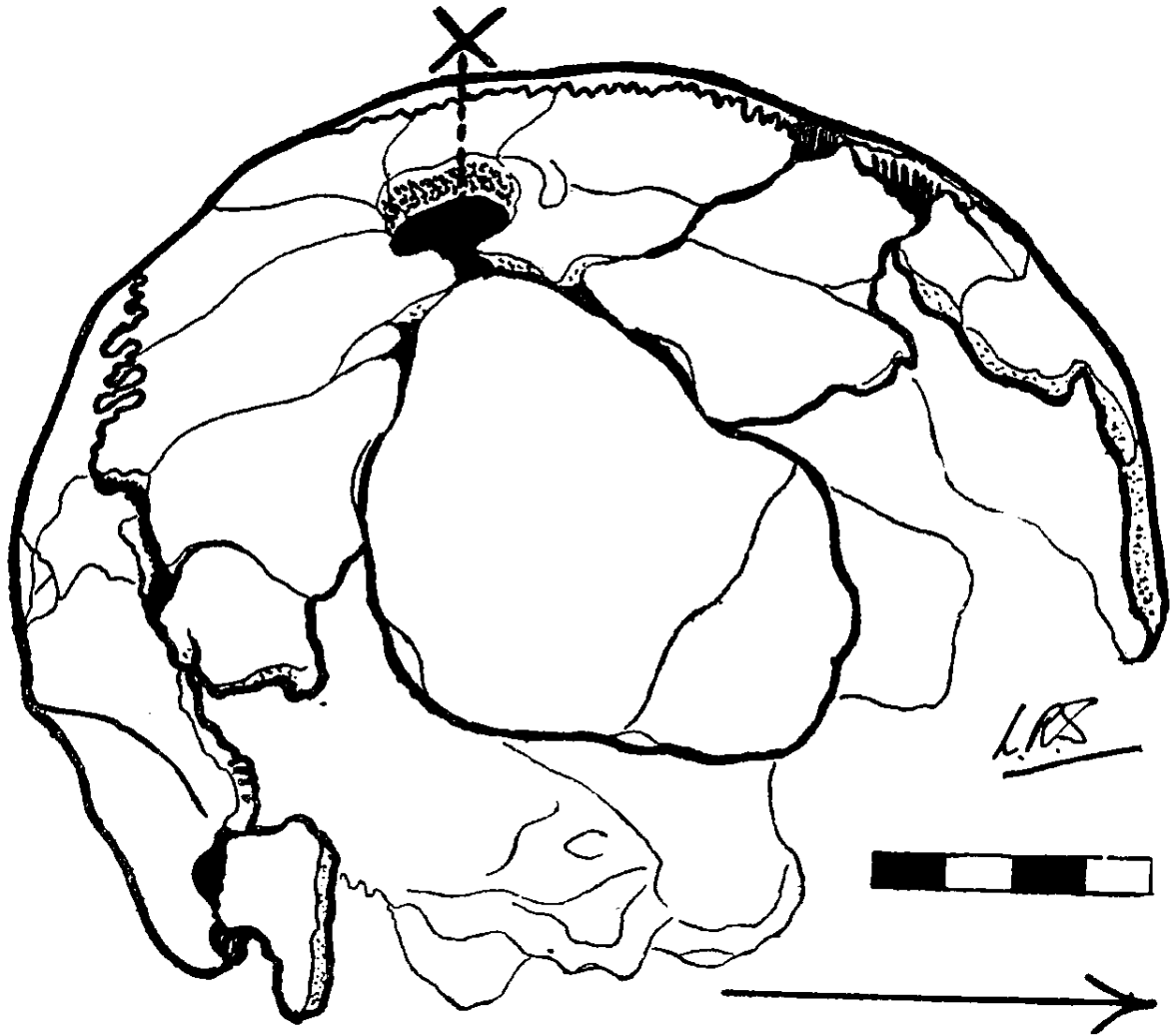


FIG. II.

This drawing of the reconstructed skull fragment was made from the right lateral aspect by means of the dioptograph. The skull was placed as nearly as possible so that the sagittal suture lay in the horizontal plane; then the skull was tilted very slightly so as to bring the suture into view. The anterior end of the skull is shown by the pointer and the trephine hole by X. The right half of the skull vault is distinguished by heavy lining, while the outlines of the left half, which is the larger, are lightly lined. The outlines of the petrous bone and of the internal auditory meatus of the left side can be seen. The diploë where visible is distinguished by stippling. The side view suggests a more forward position of the trephine hole than does the vertical view. The scale shown at the foot of the drawing is in centimetres.

MENTAL DISTURBANCE AFTER THE EXHIBITION
OF ATEBRIN,

by

P. B. Wilkinson.

Department of Medicine, The University, Hong Kong.

INTRODUCTION

Shortly after the introduction into medicine of the new synthetic remedies for malaria numerous workers, especially in the Far East, noted that the exhibition of atebtrin was occasionally followed by a state of transient excitement not unlike that seen in alcoholic delirium. As atebtrin is coming to be used more and more in the treatment of malaria it is obviously desirable that the risks attendant upon its use should be known and it is the object of this note to draw attention to three cases in which mental symptoms followed the use of the drug.

The three patients whose histories are given briefly below were all seen in the course of practice in Hong Kong during the years 1938 and 1939. The two men who developed mental symptoms both had to be admitted to the Mental Hospital during the height of their cerebral excitement, the woman was nursed throughout her illness in a private hospital. One of the men was Dutch, the other two patients were Chinese.

CASE HISTORIES

Case A. F. L. male, aged 46. Nationality Dutch. *Business man.*

On July 25th 1938 this man developed fever and was found to have *P. falciparum* malaria. At the onset of his illness he took three 0.1 gm. tablets of atebtrin by mouth and he was given 0.8 gm. of atebtrin intramuscularly and 3 gms. of quinine sulphate by mouth during the next two days. On the 26th he was unable to sleep. This insomnia persisted and became aggravated by restlessness and excitability to such a degree that morphine had to be exhibited on the 28th. He was admitted to the Mental Hospital on the 30th in a maniacal condition, shouting, screaming, struggling and praying. It was impossible to conduct any sort of conversation with him at this stage as he was wildly incoherent and quite irrational in speech. Physical examination revealed nothing noteworthy, the spleen was not enlarged and the blood was parasite free. Morphine and hyoscine were exhibited hypodermically and paraldehyde per rectum. He slept well and by the next morning was rational, but suffering from a retrograde amnesia extending back three days. He remembered becoming delirious on the afternoon of the 28th but "after that his mind was a blank." Physical examination revealed nothing abnormal in any system, and as he remained rational he was discharged from the hospital apparently normal on August 5th.

He said that he had been treated with atebtrin during an attack of malaria two years ago and had recovered uneventfully. He also admitted that he had been "several times" in a mental hospital in Holland for "nervous breakdowns," but was unable to be more explicit about these earlier mental illnesses.

He stated that he came to China 2 years ago as a result of having lost his job in Holland because of a quarrel. He had recently suffered considerable

anxiety over financial matters, and his past history and conversation made it clear that he was mentally an ill-balanced man, with a tendency to alcoholism.

His blood W. R. was negative and his urine showed neither albumen nor sugar.

Case B. P. T. K. male, aged 25. Chinese. *Shop assistant.*

This man was brought to hospital on October 12th, 1939 and he was under restraint at the moment of admission. A friend who was with him said that on the 5th of October he had developed malaria. The diagnosis was made by a doctor but the type of malaria was not known. He took some quinine by mouth and was given "one injection" of atebtrin on the 5th. Presumably he received 0.3 gm. atebtrin intramuscularly. His fever abated but on the 8th he became "mentally deranged." He talked nonsense, was restless and attempted to leave the house without dressing. Insomnia was marked and his restlessness was more in evidence at night. He was given another injection of atebtrin, presumably 0.3 gm. again, and he appeared to improve slightly, but on the 12th his mental symptoms reappeared in full force: he was exceedingly agitated, rushed into the street wearing only a vest, had to be brought back by force and was incoherent and irrational in speech. He was then sent to hospital. The friend added that he had also taken twelve tablets of atebtrin during the course of this illness, in addition to the injections and quinine by mouth.

The man had to be restrained by four assistants while an attempt was made to examine him. He was silent but extremely violent and attacked those around him on sight if restraint were relaxed for an instant. He refused to answer questions and a physical examination was impracticable. His blood showed no parasites and he was admitted at once to the Mental Hospital as a probable case of mental disturbance following the exhibition of atebtrin.

His blood W. R. was negative and after four days in the Mental Hospital he appeared to be normal in every respect. A complete physical examination at this time showed no abnormalities and he was discharged from hospital eleven days after admission. He had never suffered from any form of mental disturbance before nor was there any history of nervous or mental disease on either side of his family. He was not addicted to either alcohol or opium.

Case C. L. Y. female, aged 23. *Chinese amah.*

The patient was seen in hospital on the 10th November, 1939 because of "mental changes" which had supervened during the course of an attack of malaria. Her malaria had begun on the 1st of November with rigor, fever and vomiting. Parasites were not found in the blood at any time during her illness. She was treated with atebtrin by mouth and was given three 0.1 gm. tablets daily for three days. Her fever had by this time abated and she seemed well.

On the 4th of November she woke suddenly at midnight and "began to talk nonsense." She had not slept without hypnotics since that time and she never ceased talking while she was awake. She was admitted to hospital in the evening of the 9th and seen by me on the 10th. She lay quietly in bed talking continuously to herself in a low monotone. She answered questions readily and her conversational reaction time was very rapid. Though she appeared to be completely disoriented in time and space, and had no notion of where she was she seemed to be rational in her replies to simple questions. She was very quick at noticing clang associations and taking them up, and flight of ideas was marked.

There was a slight excess of motor activity in arms and fingers and she fidgeted constantly with a jacket button while she talked, but otherwise she showed no physical abnormalities. The central nervous system and the fundi were normal.

It was felt that, though her dose of the drug had been small, her mental condition was probably due to mild atebtrin poisoning and a good prognosis

was given. Effective doses of paraldehyde were ordered and she left the hospital apparently normal and rational ten days later.

Her mother stated that she had never suffered from any form of mental disease before, nor was there any history of mental disease on either side of the family. The girl was not addicted to any drug.

DISCUSSION.

In considering these cases the first point to be made is that all of them developed mental symptoms during or just after a course of treatment with atebrin, although only Cases A and B had been proved to be suffering from malaria. In no case was it possible to ascertain exactly the total dose of atebrin given, but the estimated figures seem to indicate that at least two of the three patients must have been unusually sensitive to the drug. Case A had had a total 1.1 gms., case B 1.8 gms. and Case C 0.9 gms. As there are numerous cases on record of accidental over-dosage of atebrin without ill effects it is possible that an idiosyncrasy of some sort existed in two of these patients.

The second point which must be stressed is that in none of these cases was the presence of atebrin in the urine demonstrated. Case A and B had received 0.8 gm. and 0.6 gm. respectively by intramuscular injection and the rest of their total dose by mouth, whereas Case C had taken the drug by mouth only. None of the patients showed pigmentation or any evidence of gastro-intestinal disturbance.

The third point which is important is that malarial parasites were demonstrated in Cases A and B only. It is, therefore, impossible to dismiss the three cases as mere malarial or post-malarial psychosis, a supposition which becomes more unlikely when the course of the cases is considered.

All these patients manifested different degrees of the same form of mental disturbance; they all showed an excess of motor activity which was so marked in the two men as to necessitate restraint and they all appeared to be completely disoriented in time and space. Absolute sleeplessness was a striking feature of all three cases, and was only overcome by massive doses of hypnotics. Clang association and a tendency to flight of ideas were noted in two of the cases and Case A showed a retrograde amnesia extending over three days. The mental picture was that of hypo-mania and while the disease was severe enough in Cases A and B to require treatment in mental hospital, the third patient was treated throughout in a private hospital.

It is significant that Case A had been in mental hospitals on several previous occasions, and it is also interesting to note that he had been treated with atebrin during an earlier attack of malaria without any ill effects. Neither Case B nor Case C had shown any

previous mental instability nor was there any familial taint or history of drug addiction. It is noteworthy that as soon as hypnotics were used effectively all these patients recovered rapidly, the longest period in hospital being eleven days in C's case. The post-malarial psychoses do not as a rule clear up as quickly as this, and the temporary nature of the disturbance is strongly in favour of its being caused by atebtrin.

That atebtrin can induce such transient mental effects is by now well recognised, and it must be admitted that such conditions are rare and seem to be mainly confined to the eastern races. The first mention of such disturbances was made by Conoley (1933, quoted by Kingsbury), and the phenomena which he described as "cerebral excitation" were the subject of a report by Kingsbury in 1934. Kingsbury, working in Malaya, was able to collect twelve cases showing such disturbances out of several thousand cases of Malaria treated with atebtrin; eight of these were transient and in two there was a history of familial mental disease. The symptom pictures shown by these cases varied from mild and transient character changes to psychoses requiring management in mental hospitals.

Udalagama in Ceylon noted six cases out of a series of 644 treated with atebtrin in which restlessness, confusion and temporary amnesia occurred. Chopra, das Gupta and Sen have also reported isolated cases of depression due to the drug, but it is universally admitted that cerebral symptoms caused by atebtrin are of rare occurrence, and all observers agree that the mental disturbance produced is usually temporary and disappears as soon as treatment is discontinued.

These disturbances have been noted predominantly in Tamils, Singalese, Malays and Chinese but the reason for these racial predilections is unknown. It is possible that there are variations in racial tolerance for atebtrin, as is the case with some of the narcotic drugs.

The three possibilities which have to be considered in attempting to explain these phenomena are:—

- (i) that they may have been cases of malarial psychosis.
- (ii) that atebtrin may have caused an unduly rapid liberation of "toxins" from destroyed parasites.
- (iii) that atebtrin may have a direct toxic action on the nervous system.

Most of the malarial psychoses observed in Hong Kong have differed materially from the cases just described. They are, in fact, toxi-confusional states characterised by agitation, confusion and hallucinations of hearing and sight. The condition tends to clear up but very much more slowly than the mental disturbances seen in these cases. In any case, it was never proved that the third patient in this group was suffering from malaria, whereas she was known

to have been treated with atebirin immediately before the onset of her mental disorder.

There is some evidence to show that atebirin reduces the parasite density in malaria more rapidly than quinine, and it is possible that the increase in concentration of malarial "toxins" following this rapid destruction may cause a psychosis. The hypothesis seems scarcely tenable in one of these cases for the reason just given, though I do not know whether atebirin can cause mental disturbance in the absence of a malarial infection.

One can only say, as regards the third possibility, that such relatively enormous overdoses of atebirin have been given without untoward symptoms of any sort, that it seems unlikely that the drug should act as a direct cerebral stimulant unless an idiosyncrasy be postulated.

I have reported these cases in order to emphasize the "neurotropic" potentialities of atebirin to those who use the drug as a routine in the treatment of malaria.

SUMMARY.

1. Three cases of mental disturbance following the exhibition of atebirin are described.
2. Only two of these patients were proved to be suffering from malaria, one case being due to *P. falciparum*, one being unspecified.
3. One of these patients was a Dutchman, the other two were a young Chinese man and a young Chinese woman.
4. The two men had to be treated in a mental hospital during the height of their mental disorder, and one of them gave a history of previous mental instability.
5. The mental disturbance was noted after a minimum dose of 0.9 gm. of atebirin and an estimated maximum dose of 1.5 gms. of the drug.
6. The duration of symptoms was short, and in all cases the mental changes disappeared within a few days of discontinuing the drug.

ACKNOWLEDGMENTS.

I have to thank Dr. S. P. Li and Dr. T. C. Pan allowing me to refer to their cases.

REFERENCES.

- | | | |
|------------------------|------|--|
| Nocht B. Mayer M. | 1937 | <i>Malaria</i> , pp. 50-54. |
| Banerjee, K. | 1936 | <i>Calcutta Medical Journal</i> , 30, 515-522. |
| Kingsbury, A. N. | 1934 | <i>Lancet</i> , 979-982. |
| Udalagama, L. | 1935 | <i>Indian Medical Gazette</i> , 70, 679-683. |

A CASE OF TYPHOID PERIOSTITIS,

by

K. H. Digby and Wm. Lai Fook,

Department of Surgery

and

K. T. Loke,

Department of Pathology, The University, Hong Kong.

Cases of typhoid periostitis have long been recognised, but as cases are not frequently encountered, this one seemed worthy of brief record.

Miss G— S— a young Portuguese lady of 17 years of age began an attack of typhoid fever soon after Christmas 1938, though the temperature was not known to be raised till 1st January. A relapse commenced on 14th February and the patient left hospital on 11th March, 1939. The Widal had been positive. No pain nor discomfort was felt in the left forearm during the illness nor in the ensuing months up till 20th October, 1939.

On the 10th October the left little finger was swollen but this subsided in a few days. On the 20th October a painful swelling appeared on the upper part of the back of the left forearm. The pain was worse at night.

The patient was admitted to the Queen Mary Hospital and a swelling 4 inches in length was found over the upper part of the left ulna. The swelling was warm to the touch, pitted slightly on pressure, and showed two or three enlarged veins coursing over it. Her physician Dr. J. W. Barnes told the patient to mention her previous attack of typhoid fever to the surgeon, and his clever suggestion put us on the track of a correct diagnosis.

On the 25th October an incision was made in the swelling down to bone without pus being found.

On the 1st November the incision was lengthened and the whole involucrum removed in one piece with mallet and osteotome. Lying snugly in the granulations lining the hollow in the involucrum was a thin flake of dead bone. The granulation tissue was sent for section and culture. The granulation tissue showed a large proportion of mononuclear cells and macrophages and the tissue for culture gave a growth of organisms showing the fermentative and agglutinating reaction of bacillus typhosus.

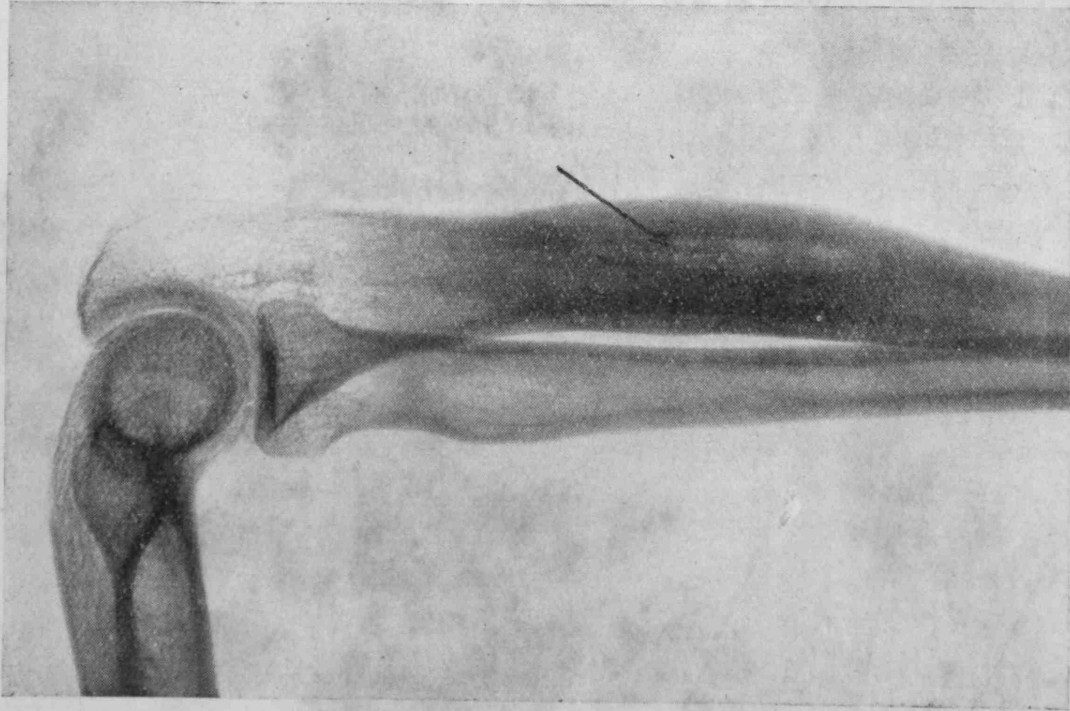


FIG. 1.

X-ray of forearm. The sequestrum can just be discerned. The new periosteum shows radiating lines faintly reminiscent of a periosteal sarcoma.

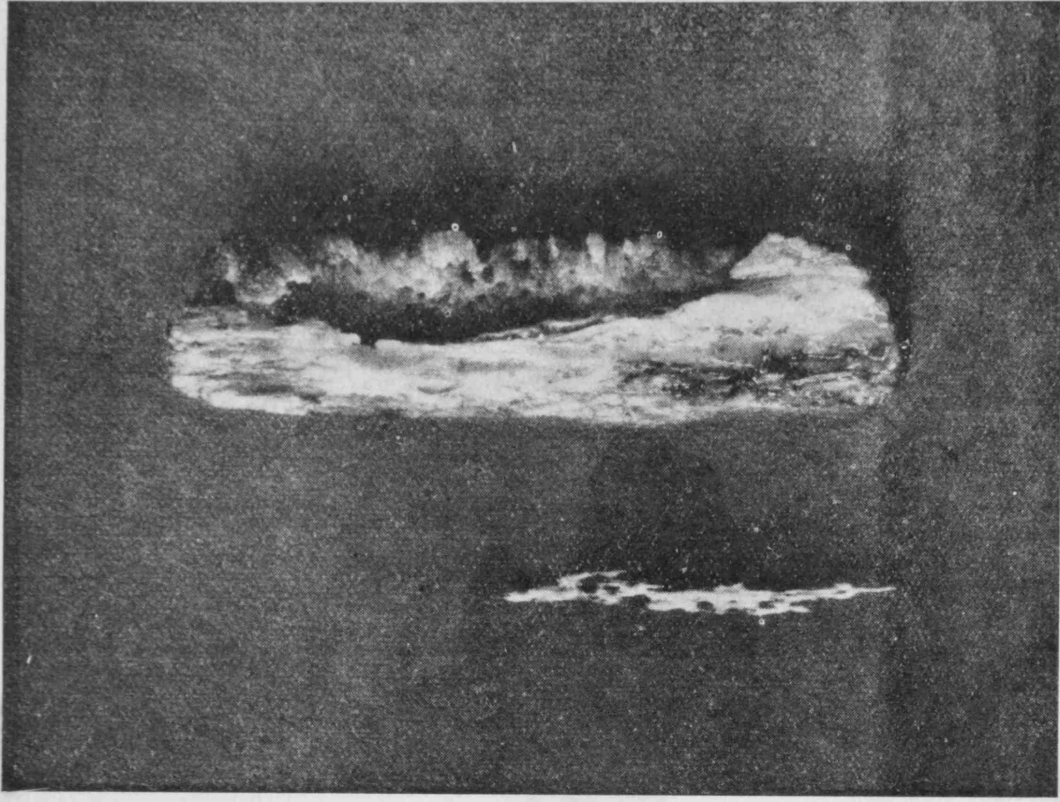


FIG. 2.

Sequestrum and involucrum removed at operation. The large involucrum (on the right side of the photograph) shows a depression to the right lined with granulations in which the sequestrum (on the left side of the photograph) lay.

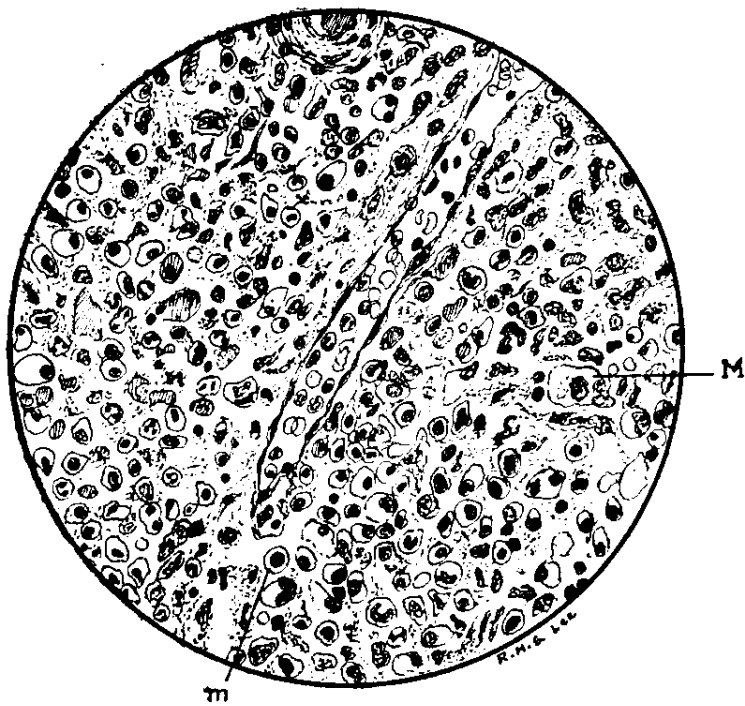


FIG. 3.

Drawing of granulation tissue in this case showing numerous monocytes (m)—large cells each with abundant cytoplasm and large reniform or circular nucleus and macrophages (M) still larger cells each with a single round nucleus and abundant cytoplasm with included lymphocytes. (We are indebted to Dr. Raymond Lee for the excellent drawing of this slide.)

A THYROID NEOPLASM WITH METASTASIS SIMULATING
NEOPLASM OF THE LUNG,

by

P. B. Wilkinson

and

H. T. Wu,

Department of Medicine, The University, Hong Kong.

This case is recorded as it illustrates how deceptive the metastases of thyroid neoplasms may be when the primary growth remains small and clinically undetectable.

CASE HISTORY.

The patient, L.H., a woman of 60, was admitted to hospital on September 19th, 1939. She said she had had occasional attacks of pain in the upper part of the right chest for one year, and cough with haemoptysis for one month. The cough was ushered in by an attack of fever and had persisted ever since, although the fever had only lasted for about a week. The cough was more marked by night than by day and was characterised by the production of small quantities of blood-tinged sputum. She had lost weight rapidly during the month preceding admission and estimated the loss at 10-20 pounds, but there was no history of night sweats. She did not complain of anorexia nor were there any symptoms suggestive of gastric or intestinal involvement. Neither had she suffered from dyspnoea on exertion or palpitation, nor was there any hoarseness or difficulty in swallowing.

The patient's past history had been uneventful. She had been married for 40 years and had had one son. Both her husband and this son were alive and healthy. She had had two miscarriages but denied having had venereal disease. There was nothing in the family history to suggest a tubercular diathesis. Her diet had always been the ordinary diet of the Chinese lower class and she did not smoke or drink alcohol.

PHYSICAL EXAMINATION.

On admission her temperature was 99.8°, respiration rate 24 per minute and pulse rate 74 per minute. She was moderately emaciated and her mucous membranes and palms were pale. She looked cachectic and her complexion was sallow with an underlying pallor. Her gait and stance were normal for a woman with bound feet.

The cardiovascular system presented no abnormalities, the heart sounds though distant being clear, and the blood pressure being 125/78. On examining the chest respiration was seen to be mainly abdomino-thoracic in type. There was some superficial venation over the upper

four intercostal spaces on the right side, but both halves of the chest moved equally well on respiration. Tactile vocal fremitus and vocal resonance were slightly diminished in the upper four right intercostal spaces and the percussion note in the same area was slightly flatter than on the left side. Air entry was diminished in the right upper zone and expiration was prolonged but no adventitious sounds were heard.

The tongue was dry and furred and the teeth were carious. No abnormality was found in the belly and the liver, spleen and kidneys could not be palpated. The central nervous system appeared to be normal throughout. The optic discs were sharp edged, the pupils reacted to light and accommodation and no signs of disease were found in the ears or throat. No glands could be palpated and the thyroid gland was neither visibly nor palpably enlarged.

A provisional diagnosis of pulmonary tuberculosis was made from the history and the physical signs found in the thorax, but further investigations rapidly made this diagnosis untenable.

LABORATORY FINDINGS.

Repeated sputum examinations failed to reveal tubercle bacilli or other organisms, nor was elastic tissue found. The sputum remained muco-purulent and blood tinged throughout. The urine and faeces were normal, but the blood Kahn test was positive.

Her blood picture was, with the exception of a relative lymphocytosis, normal.

Hb.	70%	Tallqvist.
R.B.C.'s	3,610,000	
W.B.C.'s	7,200	
Polymorphonuclears	57%	
Lymphocytes	43%	

The red blood corpuscles stained well and showed neither polychromasia nor hypochromia.

X ray examination of the chest on September 21st revealed the presence of what was thought to be a tumour mass in the upper part of the right mediastinum.

DIAGNOSIS.

In view of these laboratory findings the diagnosis had to be reconsidered. Both bacteriological and radiological evidence sufficed to eliminate the possibility of pulmonary tuberculosis. The positive Kahn reaction of the blood made it essential to consider aneurysm

and syphilis of the lung. Aneurysm seemed to be unlikely for several reasons. First, the outline of the aorta could be seen through the mass discovered in the mediastinum by skiagraphy, and its outline appeared to be normal; second, it was improbable that an aneurysm large enough to have eroded trachea should have done so without producing other pressure signs.

Syphilis of the lung was a possibility which had to be considered though it had little to support it clinically. In the first place, the woman's cachexia and progressive emaciation suggested malignant disease rather than syphilis, and in the second place she made no response to anti-syphilitic treatment with mercury, potassium iodide and arsenic.

A further radiological examination on September 25th showed that the mass in the right hemithorax did not pulsate, and this fact coupled with the irregularity of its edge strengthened the neoplastic as opposed to the aneurysmal hypothesis. Still further investigation showed beyond a doubt that the pulmonary condition was due to a neoplasm, for a skiagram taken on October 20th, one month after admission, showed that the mass had grown rapidly during the interval and had come to occupy the whole of the right upper zone.

Colour was lent to the diagnosis of primary bronchogenic carcinoma by these radiological observations and the steady deterioration of the patient also lent support to this belief. She lapsed into semi-consciousness on the 5th of October, became doubly incontinent on the 17th and died on the 28th. She had shown only two or three slight and transient rises of temperature during the course of her illness.

AUTOPSY.

An autopsy was made on October the 28th. The body was grossly emaciated, and on opening the thorax the upper lobe of the right lung was found to be adherent to the posterior thoracic wall. A solid lump could be felt in the upper lobe and on opening the lung a mass 8.5×5 cm. was found in the upper lobe. It was semi-elastic in consistency and had a well defined margin. Its cut surface was bright red and spongelike. There were numerous small broncho-pneumonic areas in the lung circumjacent to the mass.

The left lung showed apical pleural adhesions and its lower lobe contained numerous small, hard, discrete nodules similar on naked eye examination to the mass found in the right upper lobe.

The thyroid was smaller than normal, hard in consistency and on section its cut surface resembled that of the tumour masses found in the lungs. No enlarged glands were noted in the anterior or posterior triangles on either side, the tracheo-bronchial glands were not enlarged

nor was any evidence of invasion of the capsule of the gland or of gross venous thrombus found.

The heart was small and the myocardium showed brown atrophy. The aorta was slightly atheromatous. Both the liver and spleen were much smaller than normal and both showed a mild degree of capsular thickening.

A minute nodule of tumour tissue, about 5 mm. in diameter, which resembled the thyroid tumour naked eye, was found adherent to the anterior surface of the transverse colon, but the other viscera showed no macroscopic abnormalities.

HISTOLOGY.

The thyroid on section was found to have little normal glandular tissue left, and the epithelial cells enclosing the colloid-containing vesicles which survived were much lower than normal. Most of the gland tissue was replaced by large tumour cells, with dark staining nuclei and a pale cytoplasm. Very few mitotic figures were seen, but numerous small haemorrhages were noted scattered throughout the tumour. It was impossible to say on examining the sections of the thyroid whether an adenoma had been present before malignant changes supervened.

The metastases in the lungs were separated from the surrounding lung tissue by a fairly dense capsule of fibrous tissue. The tumour cells were identical with those seen in sections of the thyroid. Small areas of broncho-pneumonia were found in the lungs in proximity to the metastases.

The small nodule adherent to the transverse colon was identical in structure with the thyroid tumour and the pulmonary metastases. In both the thyroid and the metastases the small haemorrhages scattered through the tumour were a conspicuous feature. It was clear from these findings that the growth was neither a scirrhus carcinoma nor a papilliferous adenocarcinoma, and it has therefore been classified provisionally as a malignant adenoma which showed invasiveness. The classification is a tentative one because no definite evidence of pre-existing adenoma was found in the thyroid gland.

DISCUSSION.

In a case of malignant disease of the thyroid with metastasis published last year (1939 Wilkinson, Korczyn) we were driven to the conclusion that the growth belonged to the category described by Graham (1924) as malignant adenoma.

Graham attempted to classify all malignant growths of the thyroid under three heads: the scirrhus carcinomata, the papilliferous adenocarcinomata and the malignant adenomata. In this case, as in our

earlier case, there was no evidence of involvement of the lymphatic glands draining the thyroid or of metastasis having occurred through invasion of the local lymphatics.

Graham stressed the impossibility of attempting to arrived at final conclusions from the histological character of the cells. The one criterion of malignancy in any thyroid neoplasm is its capacity to invade either locally or by distant metastasis.

Carcinomata which do not originate in adenomata are not encapsulated and metastasize mainly to the lymphatic glands draining the thyroid. If a pre-existing adenoma gives rise to a carcinoma the growth is usually encapsulated and may either destroy the capsule and invade local lymphatics or it may metastasize by the blood stream and cause death, even though the capsule be intact.

In the present case there was no invasion of local lymphatics. Distant metastases had occurred in the right lung and the transverse colon, and the fact that metastasis had occurred in the right lung is in favour of the view that dissemination of tumour cells had occurred through the blood stream. It is well recognised that thyroid neoplasms often tend to invade blood vessels, usually veins, and this accounts for the frequency with which metastases are found in the lungs and bones. This phenomenon of vessel invasion is easy to understand when one considers how close is the contact between the epithelial cells undergoing malignant transformation and the endothelium of the blood vessels. Rupture into the endothelium-lined space of the veins occurs either spontaneously or following trauma, and in this way one can explain the occurrence of those cases where a tumour thrombus is found stretching from thyroid to right auricle.

Naturally the lungs afford the first site for the deposition of such venous emboli, and if they pass the lungs they may lodge in any tissue in the body. If the embolus lodges in the lungs and remains there, a metastatic nodule grows in the lung and may in its turn give rise to tertiary nodules which may be deposited in any tissue.

In this case the absence of lymphatic involvement makes it probable that the growth was a malignant adenoma which had metastasized to the right lung and transverse colon by the blood stream. The growth did not appear to be highly destructive locally and death occurred as a result of the lung involvement.

SUMMARY.

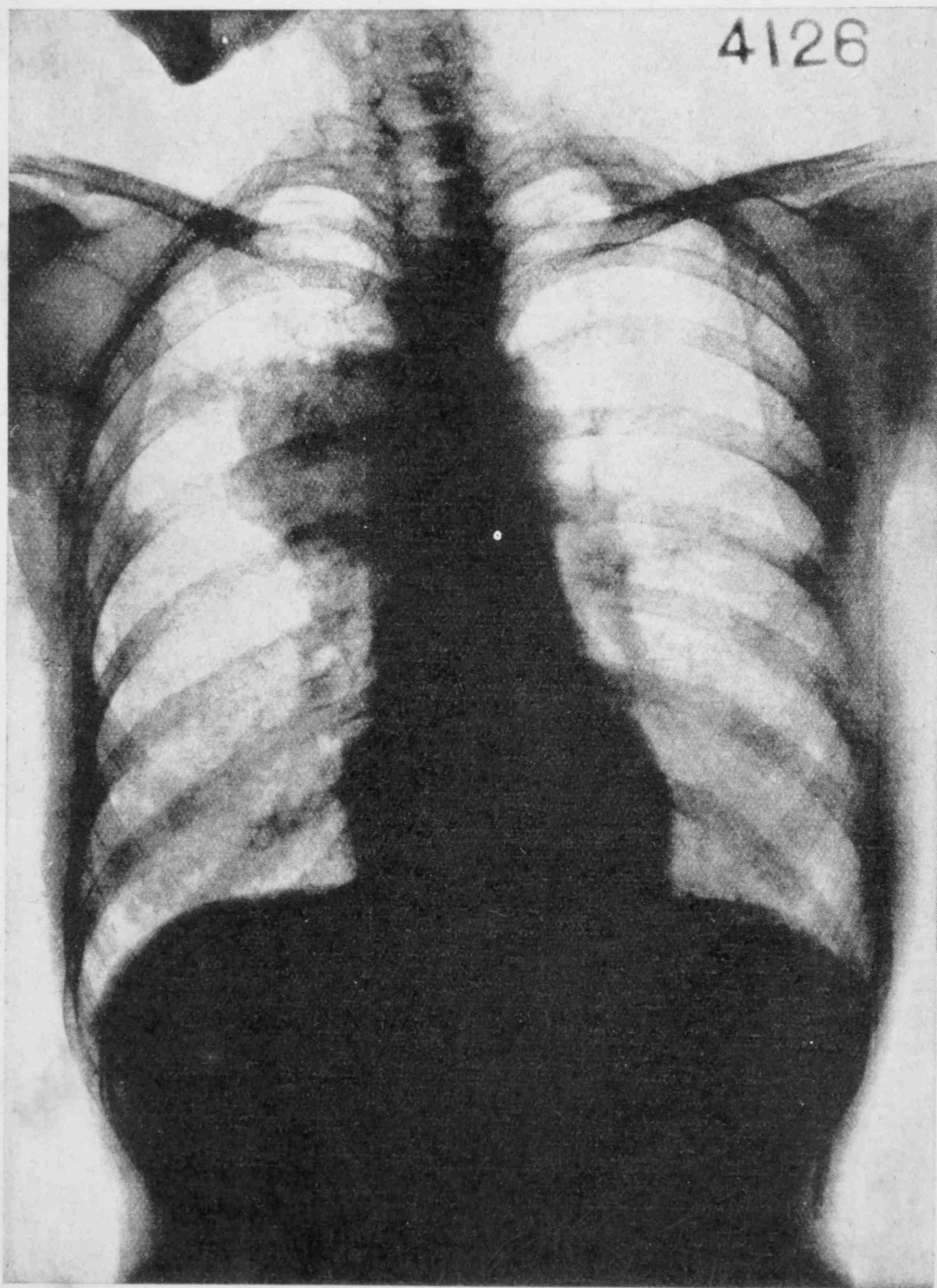
1. A malignant adenoma of the thyroid is described occurring in a woman of 60.
2. Metastasis had taken place in the right lung and transverse colon, presumably via the blood stream.

3. The invasion of lung gave rise to a baffling clinical picture, and led to difficulties in differential diagnosis.
4. The histological picture found appeared to be that of a malignant adenoma.

REFERENCES.

- | | | |
|--|--------|---|
| BLAND-SUTTON, J. | (1906) | Secondary carcinoma of the ovaries. <i>B.M.J.</i> 1: 1216. |
| CATTELL, R. B. | (1931) | Aberrant thyroid. <i>J.A.M.A.</i> 97: 1761-1767. |
| DUNHILL, T. P. | (1924) | Discussion on diagnosis of malignant disease of the thyroid gland. <i>P.R.S.M.</i> |
| | (1931) | Carcinoma of the thyroid gland. <i>Brit: Journ: Surg.</i> Vol. 19: p. 83. |
| FRANK, T. T. | (1931) | <i>Gynaecological and Obstetric Pathology.</i> |
| GRAHAM, A. | (1924) | Malignant epithelial tumours of the thyroid. <i>S.G.O.</i> 781. |
| | (1925) | Malignant tumours of the thyroid. <i>Ann: of Surg.</i> |
| HANDLEY, W. S. | (1930) | The Papilloma and its menace. <i>Lancet.</i> 1383. |
| JOLL, C. A. | (1923) | Metastatic tumours of bone. <i>Brit: Journ: Surg:</i> 38. |
| MORITZ, A. R. & BAYLESS, F. | (1931) | Papilliferous tumours of the thyroid gland. <i>Amer. Jour. Path.</i> 7: 675-689. |
| MUIR, R. | (1930) | The intraepithelial growth of carcinoma. <i>B.M.J.</i> 2, 587. |
| OESTERLIN, E. J. | (1930) | Carcinosarcoma of thyroid. <i>Ann. Surg.</i> 91: 610-612. |
| SCHREINER, B. F. & MURPHY, W. T. | (1934) | Malignant neoplasms of the thyroid gland. <i>Ann: Surg:</i> 99, 116-125. |
| SHALLOW, T. A. & LEMMON, W. T. | (1935) | Malignant neoplasm of the thyroid. <i>Annals of Surgery.</i> 101: 1190-1194. |
| THOREK, M. | (1931) | Benign adenoma of thyroid metastasizing to lungs. <i>J.A.M.A.</i> 96: 1573-1574. |
| TINKER, M. B. | (1934) | Permanent cure of cancer of the thyroid. <i>Surg. Gynae. Obstetrics.</i> 58: 460-470. |
| WILSON, L. B. | (1921) | Malignant tumours of thyroid. <i>Ann: of Surg.</i> |

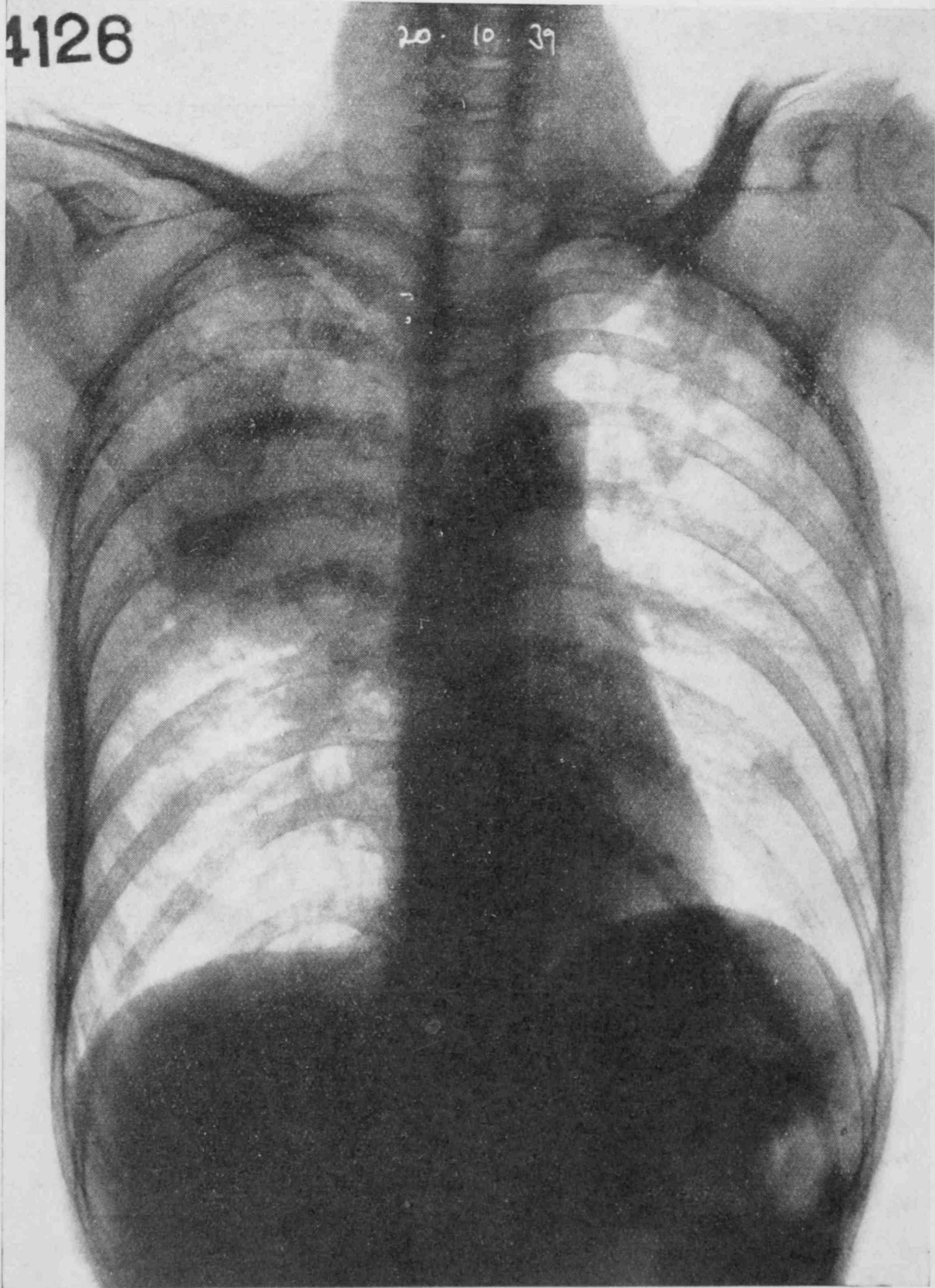
5
 5
 5
 5
 5



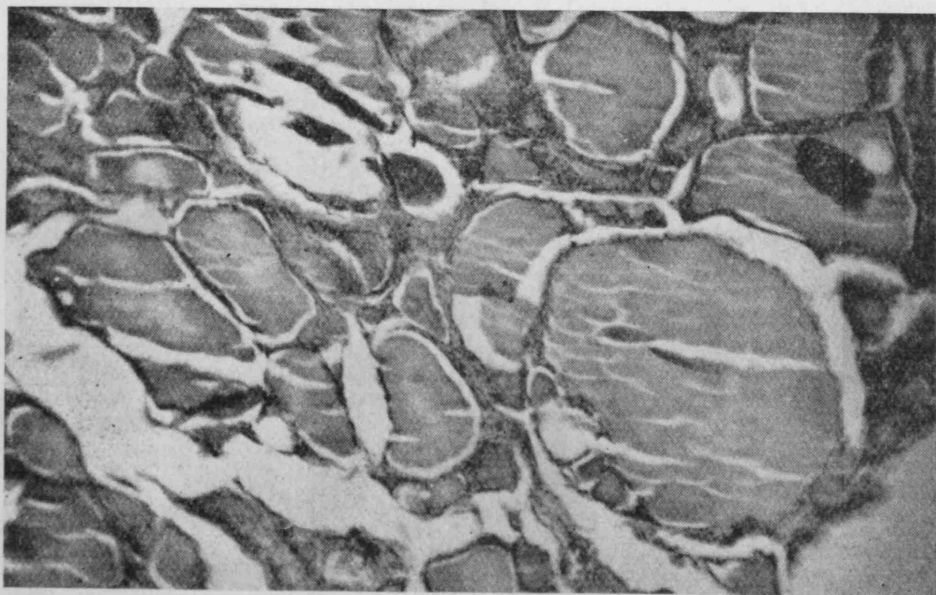
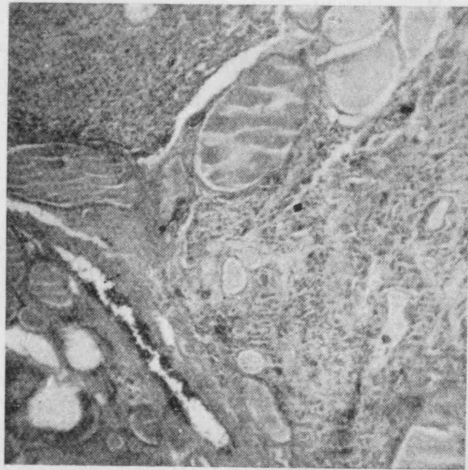
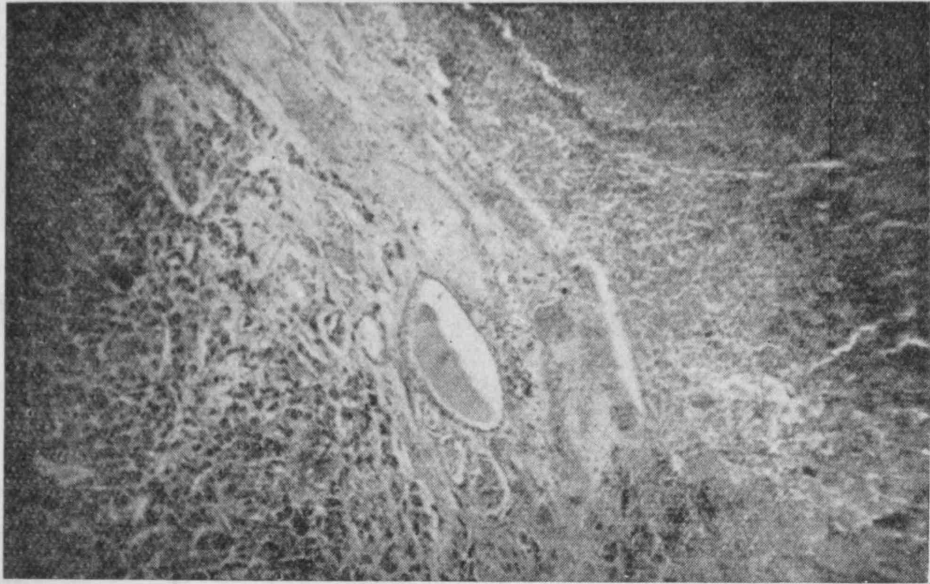
Skiagram of thorax taken on 21-9-39.

4126

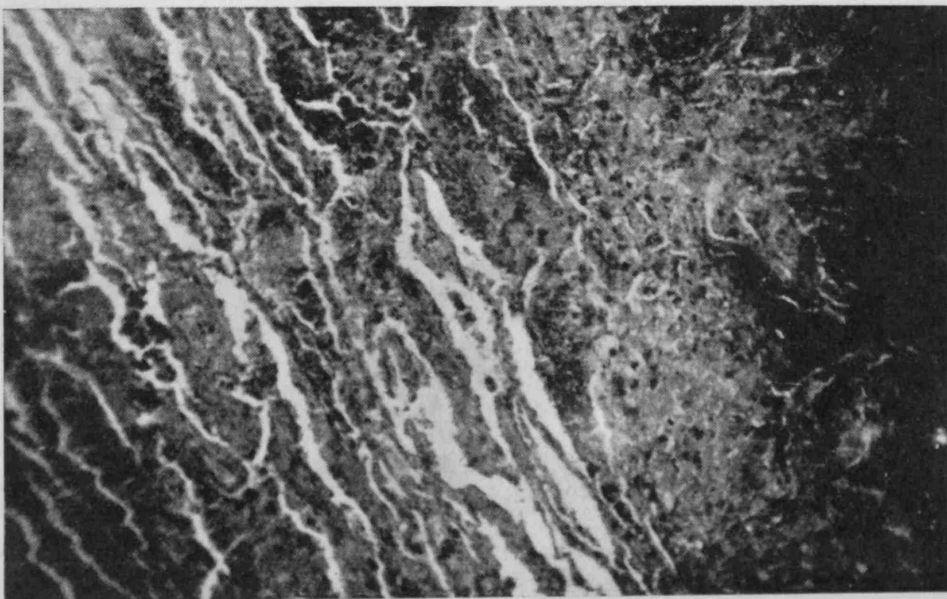
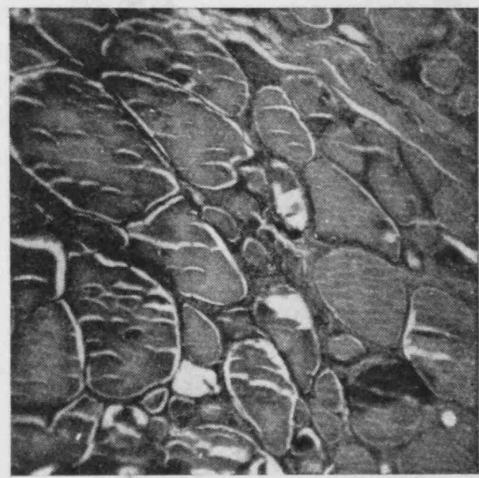
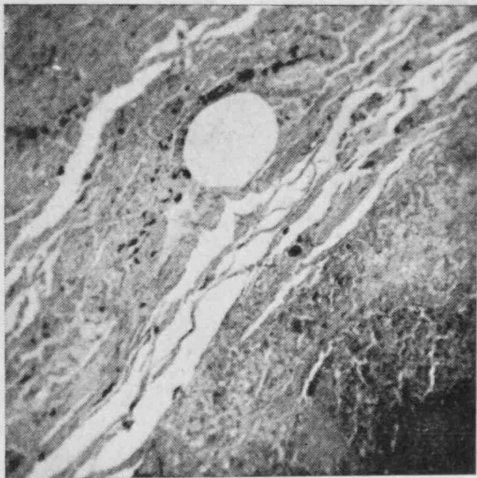
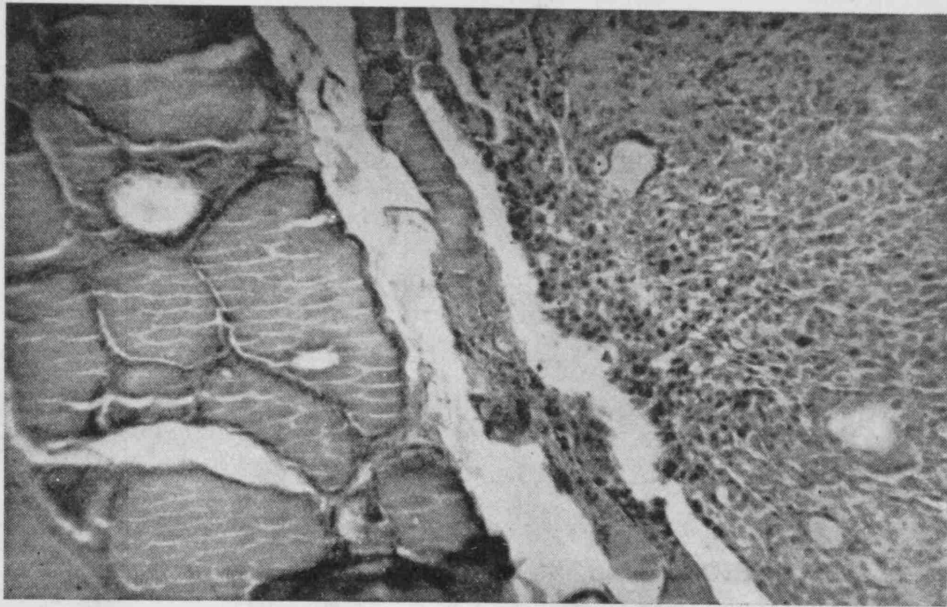
20. 10. 39



Skiagram of thorax taken on 20-10-39.



Microphotographs showing the thyroid gland, the thyroid tumour and the secondary deposits in the lung.



MUSEUM CATALOGUE.

DEPARTMENT OF ANATOMY.

THE UNIVERSITY, HONG KONG.

The time has now come to prepare a catalogue for the Museum in the Department of Anatomy.

A note of explanation is necessary to explain the system of cataloguing that has been adopted.

The system is based upon the "Decimal Classification and Relative Index" of Melvil Dewey, commonly called the "Dewey Index." In this classification the subject "Anatomy" has the number 611. Various systems are classified thus:—

- 611.1 Circulatory.
- .2 Respiratory.
- .3 Digestive.
- .4 Glandular and Lymphatic.
- .6 Genito-urinary.
- .7 Motor and Integumentary.
- .8 Nervous.
- .9 Regional anatomy.

Each division is further subdivided; thus 611.71 is "Osteology." 611.711 is the number allotted to the "Vertebral Column." 611.7111 refers to the cervical vertebrae, 611.7117 to the sacrum, and 611.715 to the bones of the skull, in their turn distinguished by further decimal numbers.

It has been found convenient to make the following modifications:

(1) Omission of the number 611. All the specimens in the Anatomy Museum might properly bear this number, but its inclusion adds to the task of labelling and would add nothing to information except in a large mixed Museum where it would indicate a human origin.

(2) Moving of the decimal point two places to the right. Thus; to take the examples above, the vertebral column becomes 71.1, the cervical vertebrae 71.11, the sacrum 71.17 and the skull bones 71.5. It has been found more convenient to commence the numerical label of each specimen with a whole number rather than with a decimal.

To continue: 71 is a general reference to "Osteology." The first decimal, .5, refers to bones of the skull and the second decimal to the special bone. Thus—.51 indicates the occipital, .52 the sphenoid, .53 the temporal and so on on the Dewey system. The occipital bone is 71.51, the sphenoid bone 71.52 and the temporal bone 71.53. But we have in the museum a number of specimens of each these bones so each is given a serial number.

(3) The serial number is given to each several specimen of the number. These serial numbers often have been given to the several specimens as they have been added to the Museum, and may indicate no more than the chronological order of their acquisition. An endeavour is made, however, to give this number more usefulness in collecting groups of specimens in consecutive numbers showing perhaps the anterior, posterior and lateral aspects of a structure.

Each specimen then has three numbers. Thus the temporal bones range from 71.53-1 to 71.53-14.

It is a matter of much gratification to note how quickly the Anatomy Museum is growing. It is hoped that this Museum, though small, is well on the way to the stage where it can be of real use to medical students not only while they are studying Anatomy but also at a subsequent period when they are concerned in the application of Anatomy and perhaps are glad of a few reminders. Grateful thanks are due to many without whose assistance the Anatomy Museum would possibly not exist. My predecessors in the Department of Anatomy, Professor Shellshear and Dr. Goldby both left valuable preparations of the brain and central nervous system. Many students have contributed their time and skill in making permanent specimens. My colleagues Dr. A. L. Tsai and Dr. E. H. Ong have both contributed very notably. Medical officers working at the Victoria Mortuary and my University colleagues have all sent interesting specimens to the Museum.

I take this occasion of expressing to all my appreciation of the part they have taken in building up this Museum so far as it has gone.

The Catalogue which follows these words is the work of Dr. E. H. Ong. It is hoped that from time to time it will be possible and indeed necessary to publish supplementary catalogues; for a Museum, like a Library, once inaugurated inevitably grows and goes on growing.

L. R. SHORE,
Professor of Anatomy,
September 1939.

10. CARDIO-VASCULAR SYSTEM.

12. HEART.

- 12.00-1 The heart of a foetus viewed from the front, showing ductus arteriosus joining the left pulmonary artery.
- 12.00-2 The heart of a foetus showing the foramen ovale.
- 12.00-3 A heart prepared to show the interatrial septum not yet perfectly closed. A bristle has been passed between the two valvular flaps of the septum.

13. ARTERIES.

- 13.334-1 Skull in sagittal section showing the course of the middle meningeal artery.

14. VEINS.

- 14.511-1 A preparation of the skull showing the position of the principal venous sinuses.

RESPIRATORY APPARATUS.

21. NOSE.

- 21.60-1 Skull prepared to show the extent of the frontal sinuses.

22. LARYNX.

- 22.10-1 A preparation to show the hyoid bone, the epiglottis, the thyroid, cricoid and arytenoid cartilages.
- 22.90-1 Muscles of the posterior aspect of the larynx.

30. DIGESTIVE APPARATUS.

31. MOUTH.

- 31.40-1 Upper and lower jaws to show complete dentition in an adult.
- 31.60-1 Parotid gland of the left side, showing the medial surface.

32. PHARYNX AND OESOPHAGUS.

- 32.90-1 Mucous membrane of oesophagus.

33. STOMACH.

- 33.00-1 Mucous membrane of stomach.

34. INTESTINE.

- 34.00-1 A specimen of Meckel's diverticulum.
- 34.20-1 A specimen showing the interior of the duodenum of an infant. Bristles have been inserted into two openings of

which the higher is that of the accessory pancreatic duct and the lower that of the common bile duct.

- 34.30-1 Mucous membrane of jejunum.
 34.44-1 A specimen of the ileum showing an aggregated lymph nodule in its mucous membrane (Peyer' patch).
 34.44-2 A specimen of the ileum showing solitary lymph nodules in its mucous membrane.
 34.80-1 Mucous membrane of the colon.

36. LIVER.

- 36.00-1 The left sided liver of a foetus whose viscera were transposed.
 36.00-2 A dissection to show the liver, the urinary bladder, the left umbilical vein, umbilical arteries, the urachus and the ductus venosus in a foetus.

37. PANCREAS.

- 37.00-1 A dissection showing the pancreas, duodenum, spleen and the gall bladder.

40. GLANDULAR AND LYMPHATIC SYSTEM.

41. SPLEEN.

- 41.00-1 A specimen of the spleen of a new born child, with an accessory spleen (splenunculus).
 41.00-2 The right sided spleen from a foetus whose viscera were transposed.

43. THYMUS.

- 43.00-1 A dissection of the thyroid and thymus gland of a new born child.

60. GENITO-URINARY SYSTEM.

61. KIDNEY AND URETER.

- 61.00-1 A pair of kidneys from an infant showing the foetal characteristic of lobulation.
 61.00-2 A dissection showing the kidneys, ureters, bladder and the suprarenal glands from a male aged about 12.

70. MOTOR AND INTEGUMENTARY SYSTEMS.

71. OSTEOLOGY.

- 71.00-1 Articulated skeleton of a child about 15 years old.

71.1 SPINAL COLUM.

- 71.11-1 Typical cervical vertebra coloured to show the homologous parts, for comparison.

- 71.11-2 A specimen of a typical cervical vertebra viewed from the superior aspect.
- 71.11-3 7th Cervical vertebra coloured to show the homologous parts for comparison.
- 71.11-4 7th Cervical vertebra viewed from the superior aspect.
- 71.12-1 The atlas displayed from the upper aspect.
- 71.12-2 The atlas displayed from the lower aspect.
- 71.12-3 The atlas showing the transverse ligament.
- 71.13-1 The axis viewed from the upper aspect.
- 71.13-2 The axis viewed from the lower aspect.
- 71.15-1 Typical thoracic vertebra showing left and superior aspects.
- 71.15-2 1st thoracic vertebra showing left superior aspect.
- 71.15-3 12th thoracic vertebra showing left superior aspect.
- 71.15-4 Typical thoracic vertebra coloured to show the homologous parts for comparison.
- 71.15-5 12th thoracic vertebra showing incomplete fusion of the dorsal arch (Spina bifida).
- 71.16-1 Typical lumbar vertebra showing superior and left lateral aspect.
- 71.16-2 Typical lumbar vertebra coloured to show homologous parts for comparison.
- 71.16-3 5th lumbar vertebra showing superior and left lateral aspects.
- 71.16-4 5th lumbar vertebra showing abnormal development of dorsal arch (Lack of fusion of laminae).
- 71.16-5 5th lumbar vertebra showing abnormal condition of neural arch (Spina bifida and incomplete fusion of lamina on left side).
- 71.17-1 Sacrum showing the homologous parts, for comparison.
- 71.17-2 Sacrum showing the homologous parts, for comparison.
- 71.17-3 Sacrum showing the homologous parts, for comparison.
- 71.17-4 Sacrum with 5th lumbar vertebra attached to it. (Partial sacralization of the 24th vertebra).
- 71.17-5 Sacrum and coccyx viewed from the ventral aspect.
- 71.17-6 The sacrum of a foetus viewed from the ventral aspect.
- 71.18-1 Coccyx viewed from the ventral aspect.

71.4 SKULL.

- 71.40-1 The skull of a foetus at full term.
- 71.43-1 Base of the skull showing the bones that enter into its constitution.
- 71.43-2 Base of the skull showing the position of the Eustachian tube.
- 71.43-3 Skull with mandible in position viewed from below.
- 71.46-1 Skull with bones coloured to show structure of orbit.
- 71.47-1 The right and the left turbinate bones.
- 71.50-1 Skull in sagittal section to show the structure of the nasal septum.

- 71.50-2 Skull in sagittal section to show the structure of left nasal fossa.
- 71.50-3 Skull divided in the sagittal plane coloured to show the sphenoid, temporal, parietal and ethmoid bones.

71.51 OCCIPITAL BONE.

- 71.51-1 Occipital bone with the areas for contact with the venous sinuses coloured blue.
- 71.51-2 An occipital bone with the contacts for the venous sinuses coloured blue.
- 71.51-3 Occipital bone viewed from the internal aspect.

71.52 SPHENOID BONE.

- 71.52-1 Sphenoid bone mounted to show the anterior aspect.
- 71.52-2 Part of the base of the skull viewed from the inferior aspect, showing the foramen rotundum and the pterygoid canal in the sphenoid.

71.53 TEMPORAL BONE.

- 71.53-1 The right temporal bone viewed from the lateral aspect.
- 71.53-2 The left temporal bone viewed from the medial aspect.
- 71.53-3 The left temporal bone viewed from the medial aspect.
- 71.53-4 Section through left temporal bone passing almost through the plane of the tympanic membrane.
- 71.53-5 Section through right temporal bone passing through the long axis of the bony Eustachian tube.
- 71.53-6 Section through left temporal bone showing the cochlea.
- 71.53-7 Section through left temporal bone following the plane of the facial nerve.
- 71.53-8 Right temporal bone with the roof and inner wall of the tympanic cavity removed.
- 71.53-9 Right temporal bone with a section through the superficial part of the tympanic cavity.
- 71.53-10 The right temporal bone viewed from the superior and inner aspect to show great superficial petrosal nerve and formation of the Vidian nerve.
- 71.53-11 The constituent parts of the right temporal bone viewed from its internal aspect. At birth.
- 71.53-12 The constituent parts of the right temporal bone viewed from its external aspect. About 2 weeks old.
- 71.53-13 The right temporal bone showing its constituent principal parts viewed from its external aspect. About 15 years old.
- 71.53-14 The constituent parts of the right temporal bone viewed from its external aspect. Adult.

71.54 PARIETAL BONE.

- 71.54-1 The left parietal bone showing the inner surface.

- 71.54-2 The right parietal bone showing the inner surface.
 71.54-3 The left parietal bone showing the medial aspect, and the course of the middle meningeal artery.
 71.54-4 The right parietal bone showing the medial aspect, and the course of the middle meningeal artery.

71.55 FRONTAL BONE.

- 71.55-1 The frontal bone viewed from the interior aspect.
 71.55-2 The frontal bone viewed from the posterior aspect.

71.56—71.59 OTHER BONES OF THE SKULL.

- 71.56-1 The ethmoid bone viewed from the anterior aspect.
 71.57 } A preparation showing the right and the left nasal and
 71.58 } lacrimal bones.
 71.59-1 The vomer showing the right lateral aspect.

71.6 BONES OF FACE.

- 71.61-1 The left maxilla viewed from the lateral aspect.
 71.61-2 The right maxilla viewed from the medial aspect.
 71.62-1 The two palate bones viewed from behind.
 71.63-1 The right zygomatic bone viewed from the lateral aspect.
 71.63-2 The left zygomatic bone viewed from the medial aspect.

71.61 MANDIBLE.

- 71.64-1 The mandible mounted to show the upper surface.
 71.64-2 The mandible of a child about 6 years old.
 71.64-3 The mandible of a child about 7 years old.
 71.64-4 The mandible of an adult.
 71.64-5 Mandible of an aged person.
 71.64-6 Mandible viewed from the left antero-lateral aspect, showing muscle attachments.
 71.64-7 Mandible viewed from the posterior aspect with the muscle attachments marked.

71.65 HYOID BONE.

- 71.65-1 The hyoid bone viewed from the front.
 71.65-2 The hyoid bone coloured to show muscle attachments.

71.7 BONES OF UPPER EXTREMITY.

- 71.71-1 The left scapula showing the glenoid cavity and axillary border.
 71.71-2 The right scapula showing the supra-spinous fossa.
 71.71-3 The shoulder girdle showing attachment of trapezius and deltoid muscles.
 71.72-1 The left clavicle showing inferior surface.
 71.72-2 The left clavicle showing its epiphysis.

- 71.72-3 The left clavicle viewed from the superior aspect.
 71.74-1 The left humerus viewed from the posterior aspect, coloured to show its muscular attachments.
 71.74-2 The left humerus viewed from the anterior aspect, coloured to show its muscular attachments.
 71.75-1 The left radius viewed from the volar aspect, coloured to show its muscular attachments.
 71.75-2 The left radius viewed from its dorsal aspect, coloured to show muscular attachments.
 71.76-1 The left ulna viewed from the volar aspect, coloured to show its muscular attachments.
 71.76-2 The left ulna viewed from the dorsal aspect, coloured to show its muscular attachments.
 71.77-9-1 The right articulated hand viewed from the dorsal aspect.
 71.77-9-2 The left articulated hand viewed from the volar aspect.

71.8 BONES OF LOWER EXTREMITY.

- 71.81-1 Immature os coxae.
 71.81-2 Os coxae viewed from the lateral aspect, showing muscle attachments.
 71.81-3 Os coxae viewed from the medial aspect, showing muscle attachments.
 71.81-4 The hip bone of a foetus viewed from the external aspect.
 71.84-1 The upper half of the right femur viewed from the anterior aspect and coloured to show muscle attachments.
 71.84-2 The lower half of the right femur viewed from the anterior aspect, coloured to show muscle attachments.
 71.84-3 The upper half of the right femur viewed from the posterior aspect, coloured to show muscle attachments.
 71.84-4 The lower half of the right femur viewed from the posterior aspect, coloured to show muscle attachments.
 71.85-1 The right tibia viewed from the anterior aspect, coloured to show muscle attachments.
 71.85-2 The right tibia viewed from the posterior aspect, coloured to show muscle attachments.
 71.86-1 The right fibula viewed from the anterior aspect, coloured to show its muscle attachments.
 71.86-2 The right tibia viewed from the anterior aspect, coloured to show its muscle attachments.
 71.87 9-1 The articulated foot of the right side viewed from the dorsal aspect.
 71.87 9-2 The articulated foot of the left side viewed from the plantar aspect.

73. JOINTS.

- 72.10-1 A preparation of the cervical column and of part of the occi-

pital bone with the anterior and posterior longitudinal ligaments and the occipito-atloid ligaments modelled.

- 72.73-1 A plaster cast of the lower end of the right humerus with the elbow joint and ligaments modelled.
- 72.83-1 A plaster cast of the left knee joint with the ligaments modelled.
- 72.84-1 A plaster cast of the right ankle joint and foot with the ligaments modelled.

73. MUSCLES.

- 73.87-1 Plaster cast of the right foot showing the plantar aponeurosis.
- 73.87-2 A plaster cast of the right foot showing the 1st layer of muscles.
- 73.87-3 A plaster cast of the right foot after the removal of the flexor digitorum brevis muscle.
- 73.87-4 A plaster cast of the right foot showing the long and short plantar ligaments.
- 73.87-5 A plaster cast of the right foot showing the long and short plantar ligaments and the lateral plantar artery and nerve.
- 73.87-6 A plaster cast of the right foot showing the long plantar ligament and the tendon of tibialis posterior.

74. TENDONS AND FASCIAE.

- 74.80-1 A dissection of the right leg showing the interosseus membrane.

80. NERVOUS SYSTEM AND SENSE ORGANS.

81. BRAIN.

- 81.00-1 A preparation to show the main features of cerebro-cranial topography.
- 81.20-1 The right cerebral hemisphere showing the olfactory, the visual, the auditory and the general sensory areas distinguished in colour.
- 81.30-1 The left cerebral hemisphere with cerebellum after removal of membranes.
- 81.31-1 The frontal and temporal lobes of the right hemisphere.
- 81.31-2 The frontal lobe and parietal lobe of the right cerebral hemisphere with the central sulcus.
- 81.311-1 The frontal lobe and of parts of the parietal and temporal lobes of the left cerebral hemisphere.
- 81.311-2 The frontal lobe and of parts of the parietal and temporal lobes of the left cerebral hemisphere.
- 81.311-3 The frontal lobe bounded by the lower parts of the lateral and the central sulci.
- 81.312-1 The left cerebral hemisphere showing central sulcus and parts of the frontal and the parietal lobes.

-
- 81.314-1 A specimen showing the posterior and descending horns of the lateral ventricle of the right side.
- 81.315-1 Three specimens of the lateral aspect of the occipital lobe, showing the sulcus lunatus.
- 81.315-2 Three specimens of the lateral aspect of the occipital lobe, showing external parieto-occipital fissure and the sulcus lunatus.
- 81.317-1 Three specimens of the medial aspect of the occipital lobe showing the cuneus and the calcarine fissure. Three forms of the cuneus are shown.
- 81.319-1 A preparation displaying the insula of the right side with the circular sulcus, the central sulcus of the insula, the gyri breves and the gyri longi.
- 81.32-1 A horizontal section through the left cerebral hemisphere traversing the corpus striatum and the posterior part of the descending horn of the lateral ventricle.
- 81.32-2 A horizontal section passing through the right cerebral hemisphere, cerebellum and brain stem.
- 81.32-3 A horizontal section traversing the lower part of the corpus striatum and showing part of the lateral ventricle with the tela choroidea.
- 81.32-4 A section traversing the corpus striatum and lateral ventricle and showing fibres from the internal capsule reaching the pons.
- 81.32-5 A section through the corpus striatum and the lateral ventricle.
- 81.32-6 A section through the corpus striatum and the lateral ventricle.
- 81.32-7 A section through the corpus striatum and the lateral ventricle.
- 81.32-8 Coronal sections through the cerebral hemisphere showing the insula, claustrum, lenticular nucleus, internal capsule and optic thalamus.
- 81.32-9 Coronal sections through the cerebral hemispheres showing the insula, claustrum, lenticular nucleus, part of the internal capsule, the optic thalamus as well as the body of the fornix and the septum pellucidum.
- 81.32-10 Two coronal sections through the cerebral hemispheres. These sections traverse the caudate nuclei.
- 81.38-1 A preparation to show the lateral ventricles from the dorsal aspect.
- 81.38-2 A dissection of the brain from its inferior aspect showing the lateral ventricles with their descending horns.
- 81.38-3 A parasagittal section of the left cerebral hemisphere to show the form of the lateral ventricle.
- 81.38-4 A horizontal section of the brain showing the form of the lateral ventricle, the corpora striata, crura of the fornix, the hippocampus and the tela choroidea.
- 81.39-1 A right parasagittal section traversing the cerebral hemisphere, the corpus callosum, the lateral ventricle the mid-brain and the cerebellum.

- 81.39-2 A specimen showing the medial aspect of the fore part of the left cerebral hemisphere with the corpus callosum and the pillars of the fornix in position and giving a view of the lateral ventricle.
- 81.40-1 A sagittal section through the cerebral hemispheres traversing the corpus callosum, the third ventricle, the aqueduct, the fourth ventricle, the cerebellum, the pons and the medulla.
- 81.44-1 A specimen showing the connections of the optic tracts with the pulvinar and the lateral geniculate body.
- 81.48-1 A specimen showing the left side wall of the third ventricle after a mid-sagittal section has been made.
- 81.50-1 A specimen showing the corpora striata with the third ventricle, septum pellucidum, the mid-brain and the fourth ventricle.
- 81.71-1 The cerebellum from its dorsal aspect.
- 81.71-2 The cerebellum severed from the mid-brain and shown in its anterior aspect.
- 81.71-3 Two sections of the cerebellum. The right specimen shows the white matter, arbor vitae, and the dentate nucleus. The left section shows the white matter, the folia and a small part of the fourth ventricle.
- 81.73-1 This specimen shows the pons and the medulla from the central aspect.
- 81.95-2 A preparation to show the falx cerebri and the tentorium cerebelli.

82. SPINAL CORD.

- 82.14-1 A dissection of part of the spinal cord in its membranes. The dura mater has been opened in the mid-line to show the anterior surface of the cord.
- 82.14-2 A dissection of the spinal cord in its membranes. The dura mater has been opened in the mid line and the posterior nerve roots removed to show the denticulate ligaments.
- 82.15-1 A dissection of the cauda equina in its membranes. The dura mater has been opened in the mid-line and spread out to show the lower lumbar and sacral nerves in position. The filum terminale internum can be seen.
- 82.15-2 A dissection of the cauda equina. The membranes which cover the lowest part of the spinal cord have been removed and the constituent nerves of the cauda equina have been displayed.

83. PERIPHERAL NERVOUS SYSTEM.

- 83.154-1 A model showing the right spheno-palatine ganglion and part of the maxillary nerve in the pterygo-palatine fossa. The pterygoid canal with its nerve is exposed.

84. EYE. ORGAN OF VISION.

84.6 ACCESSORY ORGANS OF EYE.

84.69-1 A preparation to show the naso-lacrimal duct of the right side extending from the orbit to the inferior meatus of the nasal cavity. The naso-lacrimal passage is coloured green.

85. EAR. ORGAN OF HEARING.

85.70-1 The tympanic ossicles. Malleus, Incus and Stapes of the left side.

85.70-2 A specimen showing the left middle ear from the medial aspect. The tympanic membrane and the ossicles are in position.

85.70-3 A specimen showing the cavity of the right middle ear from the front. The tympanic membrane and the ossicles are in position.

85.70-4 A specimen prepared to show the right middle ear from the front. The medial wall and the roof have been removed. The tympanic membrane and ossicles are in position.

90. REGIONAL ANATOMY.

91. HEAD.

91.00-1 A specimen showing the medial view of the right side of the head and neck after division in the sagittal plane.

91.00-2 A specimen showing the medial view of the left side of the head and neck after division in the sagittal plane.

91.93-1 A cast of a dissection of the right side of the head and neck showing the salivary glands and the superficial musculature.

91.93-2 A cast of a dissection of the right side of the head and neck showing the muscles of the tongue, the blood vessels and the lateral surface of the brain.

91.93-3 A cast of a dissection of the right side of the head and neck showing the thyroid gland, the maxillary antrum and the lateral surface of the brain.

91.93-4 A cast of a dissection of the right side of the head and neck with the trachea and oesophagus exposed. The nasal septum and the insula are shown very clearly.

91.93-5 A cast of a mid-sagittal section of the head and neck with the cerebellum intact.

94. THORAX.

94.00-1 A cast of the thorax with the anterior wall removed to show the lungs in position.

94.00-2 A cast of the thorax with the lungs removed and showing the heart with the pericardium in position.

94.00-3 A case of the thorax with the lungs and the fibrous pericardium removed showing the heart in position.

95. ABDOMEN.

95.00-1 A cast of the abdomen showing the great omentum and the liver in position.

- 95.00-2 A cast of the abdomen with the great omentum removed to show the small and large intestines in position.
- 95.00-3 A cast of the abdomen with the great omentum and lower costal cartilages removed to show the anterior surface of the liver and the small and large intestines.
- 95.00-4 A cast of the abdomen with the great omentum and liver removed exposing the stomach and gall bladder.
- 95.00-5 A cast of the abdomen with the liver, stomach, and small intestines removed showing the bed of the stomach and the spleen.

96. PELVIS.

- 96.00-1 Articulated male pelvis.
- 96.00-2 Articulated female pelvis.
- 96.00-3 A cast of the male pelvis showing the viscera and the external genitalia. The femoral triangle is well shown.
- 96.00-4 A cast of the female pelvis showing the posterior abdominal wall, the pelvic cavity and the organs are sectioned in the mid-plane.

97. UPPER EXTREMITY.

- 97.60-1 A superficial dissection of the left hand. The specimen shows part of the palmar fascia, the superficial muscles of the thenar and the hypothenar eminences and the superficial digital arteries and nerves.
- 97.60-2 A plaster cast of a dissection which shows the palmar aponeurosis, and the palmaris brevis muscle.
- 97.60-3 A plaster cast of a dissection which shows the superficial palmar arch and the digital arteries and nerves.
- 97.60-4 A plaster cast of a dissection which shows the deep palmar arch.
- 97.60-5 A plaster cast of a dissection which shows the interosseous muscles from the palmar aspect.

98. LOWER EXTREMITY.

- 98.30-1 A dissection of the popliteal fossa of the left side.

TERATOLOGY AND EMBRYOLOGY.

In the Dewey Index Teratology is numbered from 611.012 and Embryology from 611.013. These accordingly become 01.2 and 01.3.

01.2 TERATOLOGY. ANOMALIES.

- 01.22-1 Anencephaly.
- 01.23-1 Full term foetus showing short limbs characteristic of achondroplasia.

01.3 EMBRYOLOGY.

- 01.37-1 Foetus in utero.
- 01.37-2 A specimen of the right fallopian tube removed by operation. The fimbriated end which is mounted upwards is distended with fibrinous clot. Tubal pregnancy.
- 01.38-1 Uterine cast with decidua, 13 weeks.

Review of Books

"Vade Mecum of Medical Treatment," by W. G. Sears. E. Arnold & Co., London. Price 10/6.

In the matter of treatment there are, and always have been, two extremist schools of thought: on the one hand we have the cynics gently murmuring to themselves 'the young men kill their patients, the old men let them die'; on the other, "the men of blotting paper" with their strident slogan, 'count the day lost which sees no new injection given.' The cynics occasionally make a diagnosis but are indifferent to the fate of their patients, whereas "the men of blotting paper" merely discover that even bottoms will turn if insulted too often and too violently. Ultimate truth, of course, is not found by members of either school.

Dr. Sears's *Vade Mecum of Medical Treatment* has been written for the great body of medical practitioners who take their stand midway between these two extremes. Caution and sweet reasonableness are the keynotes of this little book, and the methods advocated in it are based on a recognition of the fundamental truth that the aim of all treatment is to assist Nature to overcome and cure disease. In his Preface the author also hints at the importance of the aphorism 'the first step in treatment is diagnosis,' and emphasizes that the psychological make-up of the individual patient is of paramount importance in the selection of a line of treatment. The diseases whose treatment is discussed are arranged in alphabetical order and the book ends with a collection of miscellaneous tables of constants. The book is up to date and includes such recent advances as Menleugracht's treatment of haematemesis and an appendix dealing with the Sulphanilamide group of drugs.

The accounts are admirably succinct and due care is given to the importance of reviewing possible aetiological factors in many of the conditions dealt with. There are occasional passages where the author's meaning has not been made clear; for example, no mention is made of the number of days for which plasmoquine must be given in treating malaria, nor is there any indication of the total dose of M. and B. 693 necessary in the treatment of meningococcal meningitis in children. Streptocide is not mentioned in the treatment of meningitis, though oddly enough Sulphanilamide is suggested for the treatment of malaria, despite the fact that it has been shown to be very much less effective and very much more expensive than quinine.

But these are trifling criticisms. The book is to be recommended as giving a clear, cautious and critical outline of the main lines of treatment employed in Medicine to-day, and should be of value to all those who want a compendious account of modern therapeutics.

Acknowledgements

- ACTA JAPONICA MEDICINAE TROPICALIS. VOL. 1, NO. 1, 1939.
- ARBEITEN AUS DER MEDIZINISCHEN FAKULTAT OKAYAMA. BD. 6, HT. 2, 1939.
- BRISTOL MEDICO-CHIRURGICAL JOURNAL. VOL. LVI, NO. 212, SUMMER, 1939.
- BROADWAY (WESTMINSTER HOSPITAL GAZETTE). VOL. R7, NO. 8, 1939.
- BULLETIN DE L'ACADEMIE DE MEDECINE DE ROUMANIE. TOME VII, NOS. 2, 3 & 4.
- BULLETIN OF THE SCHOOL OF MEDICINE, UNIVERSITY OF MARYLAND. VOL. 24, NO. 2, 1939.
- CHIBA-IGAKKAI-ZASSHI. BD. XVII, HT. 8 & 9, 1939.
- FUKUOKA ACTA MEDICA. VOL. XXXII, NUM. 8, 9, 10 & 11.
- HOSPITAL (THE OFFICIAL ORGAN OF THE BRITISH HOSPITALS' ASSOCIATION). VOL. 35, NOS. 8, 9 & 10.
- ISTANBUL UNIVERSITESI TIB FAKULTESI MECMUASI. YIL. 2, SAYI 8, 1939.
- JOURNAL OF BONE AND JOINT SURGERY. VOL. XXI, NO. 4, 1939.
- JOURNAL OF THE SHANGHAI SCIENCE INSTITUTE. SEPARATE REPRINTS NOS. 10 & 12.
- KING'S COLLEGE HOSPITAL GAZETTE. VOL. 18, NO. 3, 1939.
- LINGNAN SCIENCE JOURNAL. VOL. 18, NOS. 3 & 4.
- MEDEDEELINGEN VAN DEN DIENST DER VOLKSGEZONDHEID IN NEDERLANDSCH-INDIE. JAARGANG XXVIII, NO. 2/3, 1939.
- MEDICINA DE HOY—LA HABANA. AÑO IV, NUM. 5.
- MIDDLESEX HOSPITAL JOURNAL. VOL. XXXIX, NO. 4, 1939.
- MITTEILUNGEN AUS DER MEDIZINISCHEN AKADEMIE ZU KIOTO. BAND 26, HEFT 1—5. BAND 27, HEFT 1, 1939.
- MITTEILUNGEN UBER ALLGEMEINE PATHOLOGIE UND PATHOLOGISCHE ANATOMIE. JULY, 1939.
- NEW ZEALAND MEDICAL JOURNAL. VOL. XXXVIII, NOS. 206 & 207.
- OKAYAMA-IGAKKAI-ZASSHI. J. G. 51, NR. 8, 9 & 10.
- POST-GRADUATE MEDICAL JOURNAL (OFFICIAL ORGAN OF THE FELLOWSHIP OF MEDICINE). VOL. XV, NOS. 166 & 168.
- REVUE MEDICALE FRANCAISE D'EXTREME-ORIENT. ANNEE 1939, NO. 7.
- REVISTA DE LA FACULTAD DE MEDICINA, BOGOTA. VOL. VIII, NOS. 1 & 2.
- SERVICE PUBLICATION (SCHOOL OF PUBLIC HEALTH AND TROPICAL MEDICINE, UNIVERSITY OF SYDNEY). NO. 2, 1939.
- SIAM SCIENCE BULLETIN. PUBLIC HEALTH NO. 3, 1939.
- SOUTH AFRICAN JOURNAL OF MEDICAL SCIENCES. VOL. 4, NO. 3.
- SPHINCTER (UNIVERSITY OF LIVERPOOL M.S.D.S.). VOL. 2, NO. 3.
- ST. MARY'S HOSPITAL GAZETTE. VOL. XLV, NOS. 6 & 7.
- TAIWAN IGAKKAI ZASSHI., VOL. 38, NOS. 8, 9 & 10.
- TRANSACTIONS & STUDIES OF THE COLLEGE OF PHYSICIANS OF PHILADELPHIA. VOL. 7, NO. 2, 1939.
- TOHOKU JOURNAL OF EXPERIMENTAL MEDICINE. VOL. 36, NOS. 1, 2&3, 4&5, 6.
- ULSTER MEDICAL JOURNAL. VOL. VIII, NO. 3, 1939.
- UNIVERSIDAD DE LA HABANA PUBLICATION. VOL. 22, 1939.
- UNIVERSITY COLLEGE HOSPITAL MAGAZINE. VOL. XXIV, NO. 4, 1939.