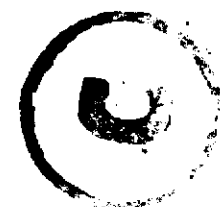


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Vol: I



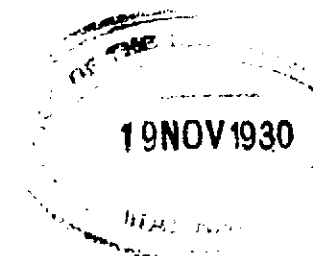
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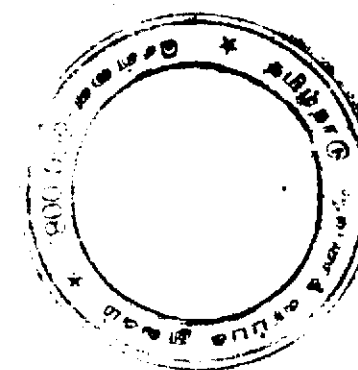
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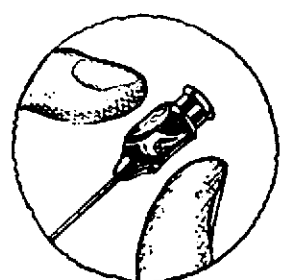


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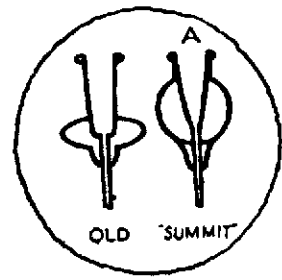
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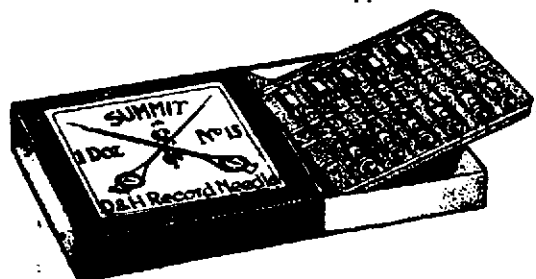
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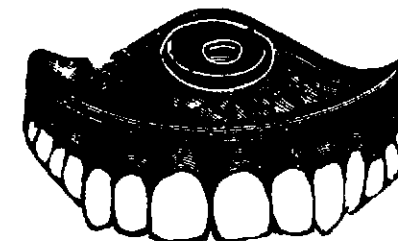
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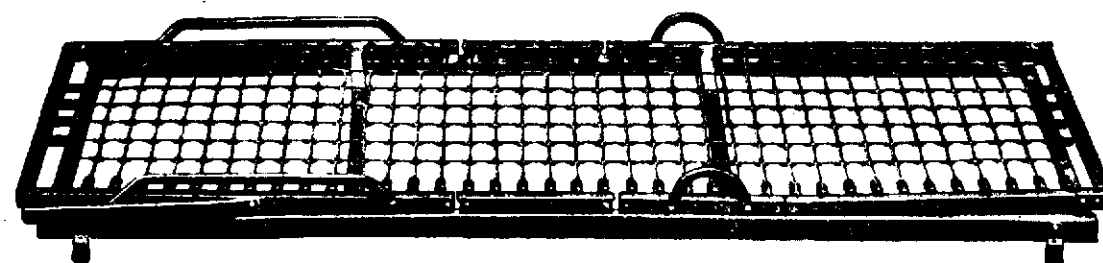
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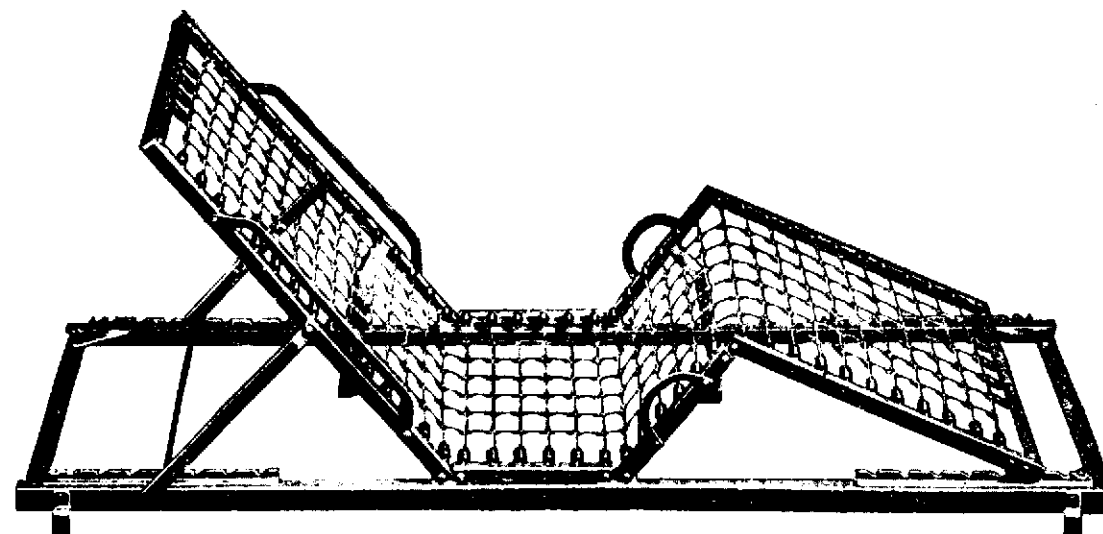
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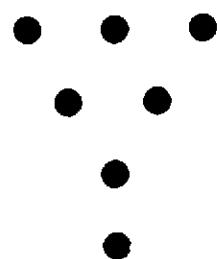
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*“What greater aim can man attain
Than conquer over human pain.”*

PLATE I.



I. RADIUM NEEDLES *in situ*.



II. MALIGNANT ENDOTHELIOMA. (*Treated with Radium*).

THE MADRAS Medical College Magazine

VOL. X

OCTOBER 1930

No. 2

Radium in Cancer*

BY LIEUT.-COL. E. W. C. BRADFIELD,

C.I.E., O.B.E., M.S., F.R.C.S., I.M.S.,

*First Surgeon, General Hospital, and Professor of Surgery,
Medical College, Madras.*

When your Secretary invited me to read a paper before this Medical Union, I decided to choose a subject which has been interesting us at the General Hospital for the past year, "Treatment of Cancer by Radium". Before, however, describing the results of our enquiries in this direction I desire to draw your attention to a subject about which, especially in India, there has been considerable misunderstanding and careless speaking. I refer to Medical Research. There are some who assume that Research means only labour with test tubes, Petrie dishes, sera and guinea pigs and others again who would condemn any college or hospital that is not producing a Lister or a Harvey with every generation. Neither conception is a true one and it is because I do consider that the General Hospital, however staffed, must always be a leader of medical advance in this Presidency that I desire to discuss with you a few examples of what has been done in recent years. It is also because I am probably nearing the completion of my active participation in its surgical work, that I feel justified in explaining to you how the hospital has endeavoured to carry out the two specific purposes of a great teaching institution, namely to teach, and by the search for new truth to advance learning.

This continued ambition in the direction of "purifying, extending and organising our knowledge" is the goal of every one of us and by such efforts Medicine becomes truly classified as a Science. "I suggest" said Sir George Newman, "that to be a clinician, the practitioner of the

* Address delivered before the South Indian Medical Union.

science and art of Medicine, inspired by the spirit of research, is a very great calling." It is only when its practitioners are really inspired by that spirit that the profession can truly be called a noble one. As regards the hospital function and I again quote Newman's essay, "The ordinary dispensary or practitioner treats the case. The University clinic does the same but out of the case it should draw a liberal education and provide for the sounder and fuller treatment of all similar patients, for it should so think and work as both to train the student and extend the frontiers of knowledge and of life".

When I first came to Madras some 20 years ago, our surgical technique was in many respects and judged by our present standard very crude. Antiseptics were the method of sterilisation in use, and it was still a great adventure to open a knee joint or an abdomen. Madras was at that time practising the then modern method but sepsis was not unknown and few Surgeons ventured far beyond the beaten track. The suggestion of an exploratory operation could only be made in a whisper. Picture the conditions to-day, where we are doing 458 abdominal operations in a year and the occurrence of sepsis after an operation causes so much surprise that immediate enquiry is made to ascertain the cause. These improvements in technique are not confined to the General Hospital but every practitioner in the Presidency is daily showing proof of how the frontiers of our knowledge have extended.

When I remember the very immature efforts of our X-ray department of 20 years ago I am filled with admiration at our present facilities and with the work which is to day produced, not only in the General Hospital but also by private practitioners whose results I occasionally have the privilege of seeing.

The field of simple clinical observation which up to 60 years ago was the only method of research in use, is by no means yet exhausted; it has rather been enlarged by the chemical and physical methods of physiological investigation and by the extraordinary discoveries of Bacteriology and Immunology, of which we are all daily taking advantage.

In this field I think we can claim some satisfaction from the success which has attended our study of ulcers of the stomach and duodenum and of tuberculous infections of the intestines. A record of 370 operations in 1929 with a total mortality of 10 per cent for gastric and duodenal ulcer is perhaps of more satisfaction to the Surgeons than to Physicians but when I remind you that ten years ago some of the latter

denied that true ulcers existed in this Presidency, I think you will agree with me that whatever our ideas about treatment, we have all obtained a very much clearer conception of these diseases. Some of us are even bold enough to have decided views as to their causation.

TETANUS is a disease which has always interested me and in the Hospital Annual Report of 1922, I compared our results with those of 1868 to 1886 and showed that, although in Europe, mainly as a result of war experience, the mortality of the disease was reduced to 20 per cent our mortality figures still remained at 56 per cent.

The heavy death rate occurs mostly amongst patients in whom the existence of a wound cannot be demonstrated, so-called idiopathic cases, and we obtained the assistance of Dr. Ramakrishnan and the Bacteriology department to help us elucidate this mystery. He has been able to isolate tetanus bacilli from the stools of several of these patients, an observation which is not only extremely interesting but opens up a new field and has suggested a line of treatment which we think has some hope of success.

Quite recently and by the help and co-operation of another institution, we have been able to gain some useful knowledge of the condition known as CLIMATIC BUBO, now classified as the fourth venereal disease under the name of *Lympho-granulomatosis inguinale*. The disease is characterised by chronic inflammation of the inguinal group of glands of both groins, which soon become adherent to each other and suppurate. When such an abscess is opened, there is not much pus while the glands will be found to be soft, necrotic in appearance and the skin undermined. Unless the glands are removed by dissection the condition will take months to heal and frequently the iliac and even the abdominal glands may be involved. I have seen three patients, two doctors and one nurse, who have been infected through abrasions on the finger and one of whom was sent to Madras because the axillary glands were thought to be malignant in character. There is no primary sore and a history of exposure to venereal infection can be elicited in the majority of cases. One doctor infected through the finger definitely, gave the incubation period as 8 days. We have been able to confirm the observation that intra-dermal injection of matter taken from bubo, after sterilisation, causes a definite skin reaction and this method should prove a useful help in diagnosis. We sent several gland masses, under sterile precautions to Colonel King at Guindy and he was able to grow an *anaerobic* streptococcus from them which appears to be identical with an organism recently obtained

from the uterus in patients who had suffered from puerperal sepsis and described by Colebrook. This observation suggests the possibility of treating the disease by vaccines and is a good example of the co-operation which is possible between the Surgical and Bacteriological department.

The last example of our search for new truth which I wish to lay before you is the result of our experience with **Radium in Cancer** during the past 12 months:—

Until recently the principle underlying the treatment of cancer was the elimination of the growth by excision with knife or cautery and each individual case was considered and examined in order that a decision might be made as to its removability. The discovery of the action of Radium on growing cells, and of its selective action on malignant cells, has changed the conception of treatment to such an extent that the treatment of choice for certain forms of cancer such as tongue, lip, cheek and breast is by Radium emanations. In spite, however, of this optimism we are not justified in describing Radium as a specific for cancer, though in certain situations it has displaced the knife. Its use requires great clinical judgment and in most situations considerable surgical skill and experience, but it represents the most hopeful advance we have obtained in the treatment of malignant disease.

Captain Barnard has very kindly consented to show us a few slides picturing the manufacture and physical properties of radium and as I wish to interest you chiefly by an actual demonstration of its results in a few of our patients, I will only remind you of a few points which explain its activity.

Radium belongs to the group of radio active elements which are continually disintegrating and in the process of which certain particles are being discharged or shot out at great speed. The loss of Radium by this process need not concern us when we realise that it would take 1,760 years for a piece of Radium to disintegrate into lead, its final product. These particles are described as Alpha, Beta and Gamma rays and of these it is the gamma rays representing 4·8 per cent of the total energy of radium, travelling at the rate of 186,000 miles per second (*i.e.*, the speed of light) which have a very high power of penetration whose therapeutic properties we make use of. The alpha rays, which are positive helium atoms have a very small penetrating power and the beta or kathode rays, which cause necrosis of tissues, can be filtered or absorbed by a sheet or protection of metal of which the best is platinum. For this reason, because we desired to employ a *gamma* therapy, Radium

is supplied in tubes shaped as needles or in applicators and is screened by platinum 0·6 mm. of which will absorb 99·9 per cent of the B-rays.

It is the actively dividing cell which is vulnerable to the rays and since all cells are not undergoing active division at the same time, it is obvious that exposure must be continued over a considerable period. The short exposures which were originally given were responsible for some of the erratic effects of earlier treatments.

The principle, then, underlying modern radium therapy is that of prolonged irradiation with small doses. The dose is calculated according to the weight of radium used and the duration of treatment in hours *e.g.*, 100 mgm. applied for 10 hours gives a dose of 1000 mgm. hrs. The following four methods of applying radium are in use:

1. *Cavitary Method*.—This is applicable in certain cases of oral, rectal and vaginal cancer. The radium is introduced through the natural opening and maintained in position by means of holders which vary according to the anatomical site. In cases of vaginal or uterine cancer, a pessary or wax model can be used. This cavitary method is of great simplicity but its general use has been abandoned owing to the difficulty of distributing the irradiation equally throughout the lesion.

2. *Interstitial Irradiation*.—This method consists in the introduction of platinum needles containing radium, and provided with trocar points and eyelets. The needles are secured in position by means of sutures or ligatures and retained for periods of 10 days or even more. The needles are introduced directly into or around the tumour, the idea being to obtain a regular bombardment of the cancer with the gamma rays. This is the method which we use in the majority of cases and its irradiation pattern is well illustrated by the X-ray pictures (Plate) of needles in position which are shown to you. The advantages of this method are:

- (1) The possibility of calculating the dose carefully and accurately.
- (2) Homogenous irradiation.
- (3) Prolongation of the period of irradiation, since all tissues are protected by the multiplicity of foci and maximum screenage.

3. *Surface Application*.—By this is meant the application of radium at a short distance from the skin. The method of applying radium directly on the skin was discarded, because a cutaneous reaction occurs before the optimum dose of irradiation to the underlying growth has been given. The usual standard distance from the skin is 15 mm. and in certain cases a greater distance is used. The various substances

employed contain usually a mixture of beeswax, paraffin and sawdust, which produces a spongy yellow mass which can be moulded on the skin. The needles are arranged on the outer surface so that they will lie at the desired distance from the skin. The apparatus is easily malleable, fairly light in weight and can be arranged to give a diffuse superficial distribution of the rays. This method is very suitable for the treatment of cervical secondary deposits, skin tumours, brain tumours and for large tumours which cannot with safety be approached by the interstitial method.

4. *Distance Irradiation or Teletherapy.*—This is a method used in the Brussels and Paris Radium institutes and utilises large quantities of radium applied at distance of 10 cm. or more from the skin. It requires 4 or more grammes of radium enclosed in a special lead protected box and a special room for treatment. With this distance irradiation, a greater penetration of the rays is obtained, dosage can be increased very considerably without damage to normal tissues, and treatment can be divided into daily sittings of short duration.

A great disadvantage of the method is that very large quantities of radium are required. During two periods we tried a modified teletherapy, 250 mgms. $\frac{1}{2}$ gramme) of radium, most of our supply being collected into a packet or bomb and patients submitted to distance irradiation at 10 cms. from the skin for 4 hours daily, spread over a period of 14 days. Captain Barnard invented a very ingenious apparatus for this treatment. The results were not encouraging and as our total supply of radium is only about 330 mgms. the method of distance irradiation is not economical, and is not worth repeating under present conditions.

I would now draw your attention to the two tables of results which you see before you. As you will see and as is so common with patients in this country, a very large percentage of patients have disappeared from our observation and although a certain number of them have shown signs of improvement before they left hospital, we have not included such in our record. One very interesting fact which is brought out is that the incidence of malignant disease is much the same in South India as it is in other parts of the world. Formerly I have commented on the comparative rarity of cancer of the breast, but during the past year this belief has been upset and suggests that there is a tendency for women to conceal the disease. The figures which are shown to you are obviously of no value as an estimation of final cure but are, I think, distinctly

encouraging. Many patients appear to have improved considerably and then when relapse occurred, a condition which we could have dealt with by the application of more radium, the disease has been allowed to progress and they only returned when extensive recurrence had taken place.

TABLE 1.

Disease.	Cleared.	Improved.	Increased.	Died.	Improved and relapsed.	No Report.	Total.
Cheek	3	5	5	3	3	16	35
Tongue	1	3	...	4	1	12	20
Tongue and Floor of mouth	...	...	...	1	1	...	3
Floor of mouth	...	...	...	1	...	...	1
Sarcomata	...	4	...	...	1	2	7
Palate	1	1	...	1	1	3	7
External ear	...	...	...	1	...	...	1
Breast	4	7	...	5	...	5	21
Parotid	2	1	1	...	...	2	6
Larynx	...	...	1	...	...	...	1
Cervix uteri	...	2	...	...	...	...	2
Lip	...	...	...	...	...	1	1
Penis	...	2	...	1	...	2	5
Oesophagus	...	...	...	1	...	...	1
Nasopharyngeal sarcomata	...	...	...	...	...	1	1
Nose-Endothelioma	1	...	...	...	...	...	1
Meninges	...	...	...	1	...	...	1
Rectum	1	1	...	2	...	...	4
Scalp	...	1	...	...	...	...	1
Tonsil	...	1	...	...	...	...	1
Endothelioma	...	2	...	...	...	...	2
Face	...	1	...	...	...	1	2
Foot	...	1	...	...	...	...	1
Glands neck	...	...	...	...	...	1	1
Total	13	32	7	21	7	46	126

TABLE 2.

Cancer Patients not treated with Radium.

No. of patients treated—Operation—	
Diathermy, X-rays—Lead	30
Died	16
No report	5
Still well and no sign of recurrence	2
Cancer cheek with excision jaw	1
Endothelioma jaw excision	1
Reported :—Disease increased	7

The figures in the first table show the late stage at which a cancer patient usually comes to Madras for treatment and how hopeless their outlook is.

The best results are undoubtedly obtained in cancer of the breast, tongue and floor of the mouth and we have entirely abandoned operative treatment for malignant disease of the tongue. Our results in cancer of the breast are really more promising than is shown, for in two patients who died, the original breast cancer had entirely melted away, and one of these, an old lady of 70, died from a secondary deposit in the spine without any of the distressing symptoms usually associated with cancer. Cancer of the cheek with its spread to the mandible or maxilla, still remains our greatest problem, and the impression gained by a study of 35 cases during the past year is that if we can evolve a suitable radium technique and can see the patients early enough the disease in this region can be dealt with. In many years' experience of this disease in South India I have seen very few patients cured by operative methods. The remarkable effect on an ulcerative leucoplakic condition which follows removal of the teeth, leads me sometimes to wonder whether even some of these successful results when unconfirmed by microscopic examination were really cases of cancer. Cancer of the cheek though often slow growing, once it has invaded the muscle, spreads far and insidiously and it would seem that it is this muscle spread which is difficult to control and effectively to bombard with our rays. Two patients returned with an extension of the growth although the centre and main tumour which had been well irradiated then appeared soft and free. Our method has been to implant the radium needles throughout and around the obvious growth making as effective a pattern as possible and to retain them for at least 8 days. Duration of radiation appears to have been of more importance than massive dosage, the larger doses in needles of 2 to 5 mgms. and in some cases running up to a total of 8,000 mgm. hours and which we have been compelled to use by limitations of supply and needle strength seem to have been responsible for the necrosis which has occasionally occurred. The method we propose to aim at is a number of small needles containing 0.6 to 1 mgm. of radium carefully distributed over the growth. In successful cases the ulcerated mucous membrane often becomes covered by a thin yellowish fibrinous deposit and in a few weeks the area again becomes soft and pliable. Necrosis of the jaw may be a serious complication but it is a risk that must be taken. The radiated area loses its pigment. Fortunately the glands are

affected late in cancer of the cheek but otherwise in our experience the disease is far more resistant to radium than is cancer of the tongue or floor of mouth.

Nine patients, suffering from inoperable malignant disease, for whom it was considered that neither operation nor radium offered any hope, have been treated by my Registrar (Dr. Narasimham) with lead selenide. The solution (Todd's D. 4S.) was obtained from the British Drug Houses Ltd. In all these patients the drug appeared to relieve the pain but in only two was any noticeable effect on the size of the growth observed. Case No. 4 improved in a remarkable way and a large sarcoma of the thigh practically disappeared under treatment. The patient died three weeks after leaving hospital, apparently from very severe anaemia which had increased rapidly during treatment with liver extract and blood transfusion. Another patient No. 5 left hospital with no visible sign of tumour, a result due to diathermy, cauterisation and possibly assisted by lead selenide injections. Unfortunately this patient could not be traced.

Radium*

BY CAPT. T. W. BARNARD, M.S.R., F.R.P.S.,

Radiologist, General Hospital, Madras.

Col. Bradfield has requested me to give you a few details about Radium from the physical aspect. Radium is a metal of the Alkaline earths similar to Calcium, Magnesium, Barium and Strontium, and its existence as an Element has been exactly ascertained by spectroscopic analysis. Its symbol is Ra and its atomic weight is 226.45, these figures having been obtained by Madame Curie. The melting point of the Element is 700° C.

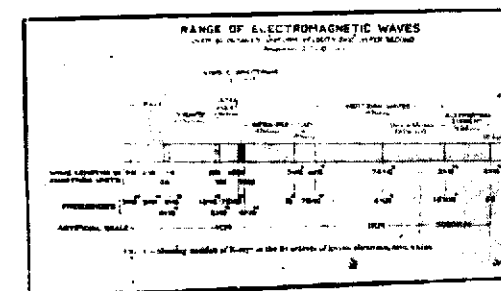
You have heard that a physical characteristic of Radium is the emission of radiations powerful enough to penetrate substances which are opaque to ordinary light. X-Rays, discovered by Professor Roentgen, in the autumn of 1895, gave us our first popular acquaintance of this type of ray. In 1896, experiments by Becquerel, in Paris, showed that similar radiations were emitted by Uranium and with these he actually made a radiograph of an Aluminium disc in which the head being of thicker metal than the remainder of the disc, was distinctly visible. These rays were named Becquerel Rays.

In 1898 Madame Curie discovered similar rays in Thorium. She with her husband continued her experiments and in 1900, after much research, discovered that by the disintegration of the Uranium atom two new bodies were produced. These were separated and named Radium and Polonium, the latter after Madame Curie's native country. Radium was found to be extremely active and Polonium comparatively weak. Other workers discovered Actinium and Radiothorium, but the most active of all these bodies is Radium, its activity being about 2,000,000 times greater than that of Uranium.

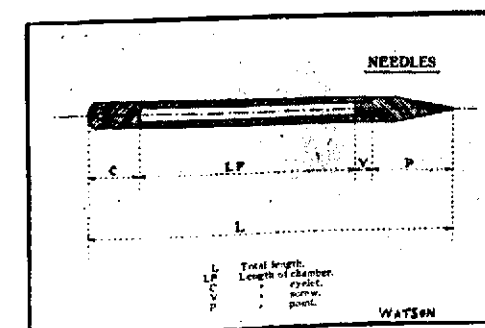
As a disintegration product of Uranium, Radium is never found in a natural state apart from its parent element. They occur together geologically, in the ratio of one part of Radium to 3,200,000 parts of Uranium. This proportion is constant and its determination we owe to Rutherford and Boltwood. Radium ore exists in all Uranium compounds. The

* An address delivered before the South Indian Medical Union following the previous one.

PLATE II.



I



II

only instance of a Radium ore free from Uranium is in Pyromorphite, (Green Lead Ore) a natural lead chlorosulphate. In its metallic state Radium is a pure white metal but, as it changes quickly when exposed to air, it is never used in that form for therapeutic purposes but, usually, is prepared as Radium bromide or Radium sulphate.

The Radium in use in Madras is Ra SO_4 and was purchased for us, by the India Office, from the Radium Belge of Brussels.

The Radium Belge obtains its uranium-radium ore from the Belgian Congo where the ore is packed in sacks and conveyed a distance of 1,600 miles to Beira from which port it is shipped to Oolen, in Belgium, for reduction.

The first part of the process is to grind the ore, after which it is leached with acid or alkali to bring the Radium into a form in which it is readily separated from other metals. Barium is added and precipitated with the Radium, the resulting sulphate then being converted into a chloride solution. Under the influence of heat the Barium chloride and the Radium chloride are separated, the latter crystallising more quickly than the Barium chloride and being removed as soon as crystals form. The process is repeated many times, each formation of crystals enriching the Radium chloride; and, eventually, all of the Radium, as a chloride, is recovered.

Accurate chemical control of every stage of the proceedings is essential and this is especially so in the final series of fractional crystallisations following the conversion of the chloride into carbonate and then into bromide.

To separate one grammie of practically pure Radium Bromide requires a long and complicated process and involves the use of 100 tons of the richest deposits of Pitch Blende, etc., 5,000 tons of water and 50 tons of chemicals.

When the Radium bromide is finally purified it is sealed in glass tubes and delivered to the Physical Department for measurement of Radium element content. Upon completion of the measurements the Radium salt is transferred to the Laboratories of the Radium Belge at Brussels and is there distributed into a variety of tubes, needles and plaques designed for therapeutic application, these containers being separately measured and certified before being despatched to purchasers.

Until Radioactivity was discovered, atomic changes, such as the transmutation of the element, atom by atom, into other substances, had

not been actually observed. It is now established that this process is dynamical and always goes on at a definite and unalterable rate. In the case of Radium about 1 per cent. of its mass disintegrates in 25 years.

You are aware that radiations from Radium are composed of three types, these having been designated Alpha, Beta and Gamma, by Sir Ernest Rutherford, who made the first analysis of these complex rays. They are emitted simultaneously, their relative proportions being approximately 10000 : 100 : 1.

The intensity of the rays varies inversely as the square of the distance from the Radium. All the three types give off secondary radiations when they pass through or collide with any substance.

Measurements and Standards.—The milligramme is the unit for measuring Radium, the standard being a glass tube containing 21.99 milligrammes of pure Radium bromide which was prepared by Madame Curie and adopted by the International Radium Standards Committee, in 1912, as the International Standard. It is deposited at Sevres but is not used for practical work. There are about 7 other standard tubes, which have been certified after comparison with the primary tube. Two of these are in England, one at the Radium Institute, London, and the other at the National Physical Laboratory, Teddington; the remaining tubes being in Paris, Brussels, Vienna, Berlin and Washington.

Radium preparations should not be accepted by purchasers unless accompanied by a certificate from one of these institutions stating the Radium element contents of the preparation.

As already stated, Radium for medical uses is usually prepared as Radium bromide, RaBr_2 , $2\text{H}_2\text{O}$, or Radium sulphate, RaSO_4 . The sulphate is generally used for direct work as it has a high Radium element content and, being insoluble, the changes of loss are minimised.

The containers may be made of many materials, the most satisfactory one for needles, and that in general use in Europe, is made of platinum, which has been hardened with iridium. The Radium content of such needles seldom exceeds 5 milligrammes, the tendency being to use many needles of small element-content, instead of one or two containing many milligrammes. The walls of these needles are usually 0.5 millimeter thick, this being sufficient to screen off all the Alpha rays and practically all the primary Beta radiations. In recent years we have increased the thickness of new supplies to 0.6 mm. platinum.

Radium

Other containers are in the form of tubes, the contents of which may be up to 50 milligrammes or more; these are mostly used in gynaecological work. There are also flat applicators of various sizes and shapes. A good substance for the latter is monel metal, an alloy of nickel, copper and other metals. Monel metal is as hard as steel and does not corrode. The whole applicator is made of this metal; the thickness of the walls and back being 1 mm; the Radium is sealed within the chamber by a monel metal cover 0.1 mm. thick. This thickness permits about 50 per cent of the primary Beta rays to pass, these radiations being of great value in superficial lesions. The applicators vary in size from 1 to 8 sq. cms. containing 2.5 to 10 milligrammes of Radium element per sq. cm.

Radium costs about £ 12,000 per gramme. This means that with Platinum containers, certificates and import duty, one gramme of Radium would cost a Private Medical Practitioner in India 2 lakhs of rupees.

Madras Presidency owes its Radium Service to His Excellency Lord Goschen; his then Chief Minister, the late Rajah of Panagal, and the present Minister of Public Health, the Hon'ble Mr. S. Muthiah Mudaliar, whose keen interest I was able to secure in creating a Radium Department in the X-Ray Institute.

We began work with 115 milligrammes of Radium element, Government adds to its stock by the purchase of Radium and containers costing over Rs. 20,000 each year. Including this year's indent we shall have 664 milligrammes of Radium element in the form of Radium sulphate, RaSO_4 , this being distributed in 197 platinum and monel containers.

Although Madras has only, about $\frac{7}{10}$ th of a gramme of Radium element, we understand that this quantity is more than that possessed by any other Institute in India. Compare this state of affairs in India with the position in Europe and America where in some of the big Institutes as much as 4 grammes is used at one time, in a 'bomb' for Radio-teletherapy.

It may interest you to know that the famous "Becquerel Burn" gave birth to Radium Therapy. In 1901 Becquerel was experimenting with a glass tube containing Radium and, being interrupted, placed the tube in his waist coat pocket, in which it was left for several hours. Two weeks later there developed a severe dermatitis on the skin in the neighbourhood of the pocket. This reaction drew the attention of the medical profession to the Bio-chemical action of such radiations and upon this accidental beginning the medical application of Radium has been evolved.

As Col. Bradfield's paper refers to patients treated with Radium sulphate, I have made no reference to Radon, an emanation which can be collected from the mother Element without loss to the latter. During its life Radon is as effective as Radium and is used a great deal in Europe and America. We hope, eventually, to install in Madras the necessary apparatus to produce 150 millicuries per day, which, with our stock of Radium, will go a long way to reduce the waiting lists of patients requiring treatment.

Some Common Skin Diseases*

BY LIEUT.-COL. J. M. SKINNER, I.M.S.,

Physician-in-charge, Skin Department, General Hospital, Madras.

In examining any case of skin disease the following points are noted :—

(1) The distribution of the lesions, (2) the type of lesion, (3) whether more than one type of lesion is present or not, (4) the elements of the skin affected (hair, glands, epithelium, etc.) and (5) the colour of the lesions. Grattage is useful in very scaly eruptions, e.g., psoriasis. The scales are removed layer by layer with a blunt instrument: in psoriasis the scales are easily removed and a red dry surface is exposed. Diascopy observation of the lesion through a glass pressed on the part to detect cellular infiltration such as the 'apple jelly' nodules of lupus.

In the examination of chronic cases, the original disease has lost its characteristic appearance and search should be made for more recent lesions at the edge or in another part of the body.

In all cases of skin diseases the state of the internal organs should be noted, e.g., the presence of albumen, e.g., in extensive scabies, anæmia, hypothyroidism, varicose veins, and so on. Septic foci in tonsils, for example, are most important in skin disease due to streptococci. Unless these are eradicated the skin disease will not heal and will keep recurring. Similarly, in treatment, internal disease should be rectified as well as prescribing for the skin.

Case I shown illustrates typical *Impetigo contagiosa*. The common distribution is on the face scalp, ears, limbs, fingers and buttocks. The initial stage is a small patch of erythema quickly succeeded by a blister with an erythematous margin. The contents of the blister soon become turbid, dry and scab on the skin. When it falls off, healing rapidly occurs without scarring. Cases with marked pustulation and massive scabs are almost certainly secondarily infected with staphylococcus. Itching is moderate and scratching leads to extension of the disease. In the treatment, although it is a septic disease, strong antiseptics should not be used: they damage the surrounding skin and predispose to infection of it. A simple lotion of calamine with 2 grs. ichthyol to the ounce is effective. The patient should allow the lotion to dry on to encourage

* An address delivered before the South Indian Medical Union.

scabbing, and when the scab falls off healing takes place. Another method is to prescribe Ung. Hydrargyri Ammoniata to be applied to all the lesions.

Case II of the same disease illustrates a chronic patch of conglomerate impetigo. The skin is thickened and hard and chronically congested. Traces of the edges of ruptured vesicles are present at the edge and on the surface. I do not know why the disease should be limited almost entirely to one part, commonly the arm or leg. In the treatment, salicylic acid ointment 10 gr. to the ounce should be applied to soften the thickened skin and remove accumulated epithelium. Vaccines are often helpful.

Case III is one of *lupus* on the ankle. The patch arose 14 years ago along with a patch on the face now healed. The patch on the ankle is healed above but is active on the lower edge and contains many 'apple jelly' nodules. It is raised, and the edge is bluish. These patches arose after an attack of measles which is often the case in children and they are frequently multiple and usually heal well.

The diagnosis is obviously not syphilis for the long history and the superficial nature of the disease and the absence of sharp cut edges are all against this diagnosis. Eczema causes intense itching and does not scar. In the treatment, attention must be paid to the general health as in tuberculosis elsewhere. Sunlight, natural or artificial, to the back, chest and limbs raises resistance. Locally, Finsen light is the best but is tedious as only small areas can be exposed at a time. This treatment leaves a good supple scar. One of the characteristics of the disease is for nodules to be left in the scar which later break down and cause recurrence. Watch should be kept for this and nodules treated at once.

Ionization with 2 per cent salicylic acid is also good and leaves a good supple scar. This is especially important when the disease is near the eye as a contracted scar leads to unsightly deformity of the eyelid. The face is the site of 90 per cent of lupus lesions.

Case IV.—Ringworm in children is quickly dealt with by an X-ray exposure to the area of scalp affected and the immediate neighbourhood. The effect is to reduce the vitality of the hair follicles so that the hair falls and with it the fungus. The fungus is still on the skin and is easily dealt with by Ung. Hydrargyri ammoniata. In ringworm of the scalp in children, the hair is secondarily affected by extension from the skin. A rare form of ringworm of the scalp is the 'black dot' ringworm. The (usually extensive) area of scalp is denuded of hair but covered with

many black dots, which are the stumps of hairs broken flush with the skin. Patches resemble those of alopecia areata except that in the latter there are no stumps of hairs. The treatment is the same as for ordinary ringworm, but the disease is apt to be very persistent. In all cases examination of the scalp should be made every fortnight for a month or two to detect and treat recurrence.

In the diagnosis of *ringworm* note the following points:—scaly patches, broken hairs, no mark of exclamation! hairs at the periphery, fungus in the hair on microscopic examination. In Black dot ringworm note the scalp is smooth, but not shiny, no broken hairs but black dots in the mouths of the hair follicles, fungus found on examination not on the outside but filling the interior of the hair, no! hairs.

In *alopecia areata*, the skin is smooth and shiny and bald or very few hairs remain which are not loose (as in ringworm); at the periphery, hairs are found, and no fungus is present. In Seborrheic dermatitis of the scalp, there are no broken hairs or fungus. In the moist variety the patches are greasy and greasy scales cover them.

In *psoriasis* of the scalp the patches are usually larger, and flatter, have no broken hairs or fungus and there are patches on other parts of the body. Impetiginous patches of the scalp are superficial and sticky, there are also lesions elsewhere, as a rule.

Where the X-rays are not used, Iodine as an ointment, e.g., iodox applied twice daily is useful, the procedure is to shave the area, rub in the ointment twice daily for 20 minutes, cover with a cap to prevent ointment running into the eyes. Examine twice monthly afterwards to detect and treat recurrences. Other useful preparations are Ung. sulphuris iodid, or equal parts of Sulph. precipitatum and acid salicylic 20 gr. each per oz. Treatment should be suspended if any dermatitis supervenes and a milder preparation substituted.

Ringworm of the beard and *sycosis coccogenica* (staphylococcus) resemble each other.

Tinea barbae is local and does not tend to spread, the lesions are much infiltrated and lumpy, like blind boils: the hair is loose and contains fungus. *Tinea sycosis* (coccogenica) is wide spread including both sides of the face. The upper lip which often escapes in *Tinea barbae* is also affected. The infiltration is moderate and there is folliculitis and perifolliculitis but no fungus in the hair.

A common ringworm of the hands and feet simulates eczema. In both there is itching. In ringworm, the patch begins commonly on the back

of the hands and feet near the fingers and toes and spreading to them. The margin is well defined as a rule while diffuse in eczema which also at some time commonly 'weeps.' The fungus is found in the scales, but is scanty and one negative result is not sufficient to exclude. In every case do not omit this search for fungus. The best treatment is Whitfield's ointment which would not suit eczema, hence the importance of diagnosis by the microscope.

This form of ringworm is persistent and is apt to recur. To prevent this, advise the patient to continue the treatment for a fortnight after the skin appears normal.

Rashes are often mistaken for syphilis. There are also usually present other secondary manifestations, general adenitis, mucous patches or condylomata, headache and sore throat, falling of the hair specially in the occipital region ('moth eaten' scalp appearance) and a positive Wassermann. The eruption itself is polymorphous, symmetrical, appears suddenly, disappears more slowly. There is no pain or itching; the lesions are rounded or oval; scaling is absent or very slight and the colour is reddish brown (raw ham).

Case V is one of leprosy. Note the depigmented patches; the depigmentation is never complete (as in leucoderma); the edge is never jagged and clear cut (as in leucoderma) but is indefinite and hazy and has smooth regular outline. They are rounded or oval in shapes and anaesthesia is present in patches which have been present some time and is often seen very early in the history of the patch. Itching is exceedingly rare and never a prominent symptom. This is the early or first stage. In the second stage when deformities of the fingers and trophic ulcers develop diagnosis is simple. This is a nerve or anaesthetic case. In the treatment it is of the utmost importance to make a thorough examination to detect any complicating disease such as hookworm, tubercle, syphilis or skin disease and deal as efficiently with these as possible. Their presence prevents the cure of leprosy. Instructions to the patient should enjoin him to be particularly careful of the cleanliness of his skin, to wear fresh clothes every day and change sweaty clothes as often as necessary; feed well and with as much variety as possible; to take vigorous exercise in the open air; to *persist* with the treatment. *He should never be advised to give up his work as the depression of an unoccupied life with its tendency to brood over his misfortune is very bad psychically.*

Whatever injections are given, e.g., E. C. C. O. should be given regularly commencing with 1 c. c. and increasing by 1 c. c. each time

up to 10 c. c. The injections are given twice weekly in the outer part of the thighs alternately. To avoid abscesses not only is asepsis necessary, but the injections should be given well into the subcutaneous tissue so as not to come greatly in contact with the under surface of the skin. Injections in the thighs are dispersed by the action of walking more quickly than when given in the arm. Intramuscular injections are not advised. After a time the muscle develops a hard lump which may take a long time to disappear. The temperature should be observed and any extension of the disease, or pain should be noted as evidences of reaction; if slight it is probably helpful though the patient may be depressed at its occurrence and require cheering up. Injection should be suspended or the dose reduced for a time. If the reaction is severe (in a nerve case slight fever but mainly neuralgia in the affected nerve) aspirin is useful: if a skin case (nodular) temperature up to 102-3 may run for several days or a fortnight and new nodules appear. In this case the reaction may be controlled by injections (intravenous) of sod. antimony tartrate every other day in doses 0.04, 0.06, 0.08, 0.1 grm. in 2, 3, 4, 5 c. c. distilled water. This constitutes one course. If the fever persists, wait three days and repeat the course. A third course may be required. Adrenalin or ephedrin is also useful in these cases.

A difficulty in treatment is to tell when a case is cured; the difficulty does not arise in nodular cases so much as nerve cases. Some residual anaesthesia persists, the result of destruction of nerve fibres which seem not all to regenerate. It is not a matter of very great importance practically, as when the patient arrives at this nearly cured stage, his natural resistance has so improved that cure is practically certain to ensue even if you stop treatment too soon, though it may be temporarily stayed by some intercurrent disease such as an attack of typhoid.

Cholecystography

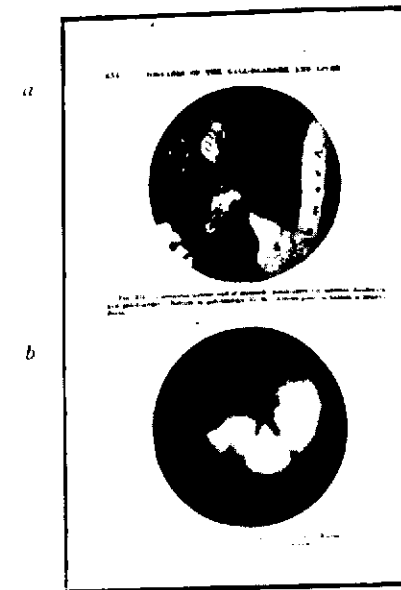
BY DR. M. J. SANTANA KRISHNA PILLAI, L.R.C.P. & S., D.R.M.E.,
Government X-Ray Institute, Madras.

History.—Graham and Cole working on the global capacity of the liver demonstrated the utility of employing certain dyes for visualising the Gall Bladder. They first worked with Sodium Tetraiodophenolphthalein, among many other experiments with various salts and dyes, but on account of inconsistency in toxicity due to impurities Tetrabromophenolphthalein was tried. They showed that the intravenous administration of Sodium Tetrabromophenolphthalein is relatively nontoxic and that this body is excreted almost exclusively by the liver. The villi of the gall bladder concentrate these dyes to such an extent that it becomes opaque to X-Rays.

The toxicity of the Iodine salt has been successfully traced to impurities contained therein. But the Iodine salt (due to the higher atomic weight of Iodine) produces a greater density of the picture and is actually less toxic than the Bromine salts when given in doses of 5 grms. to an adult; whereas to produce the same density (on the film) larger doses of the bromine salt have to be given.

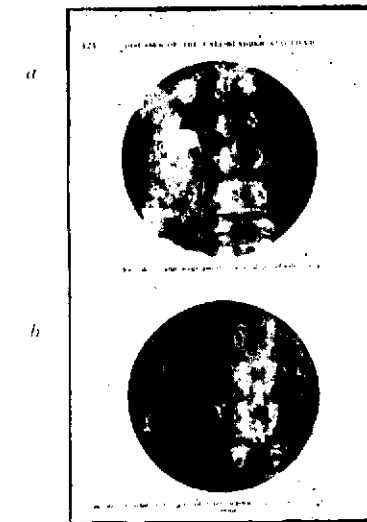
The following conditions are essential for visualisation of the gall bladder:—

1. The drug, given orally, must be completely absorbed by the alimentary tract.
2. The drug must be excreted freely by the liver; otherwise, as in Cirrhosis and atrophy of liver interfering with efficiency of the liver, the test fails.
3. The Hepatic and Cystic ducts must be patent in order to facilitate the filling of the gall bladder; the patency of the gall bladder and the bile ducts will determine the easy entering into and exit from the gall bladder.
4. In fistulous communications of the gall bladder with surrounding structures the bile will drain away and thus nullify the results.
5. Epithelium of the villi from the mucous membrane of the gall bladder must be efficient enough to concentrate the dye under the sub-mucous layer. Any condition interfering with the integrity of the mucous membrane results in reducing the degree of visibility.



(a) Fig. 378.—Carcinoma pyloric end of stomach, communication between duodenum and gall-bladder. Barium in gall-bladder, G.B. Arrows point to barium in hepatic ducts.

(b) Fig. 379.—Reconstruction of common duct (Sullivan method). Rubber tube, *t*, partly in common duct, partly in duodenum.



(a) Fig. 362.—Large, single gall stone at *s*. Injected kidney at *p*.

(b) Fig. 363.—Cluster of faceted gall-stones, indicated by arrow, very near vertebral column.

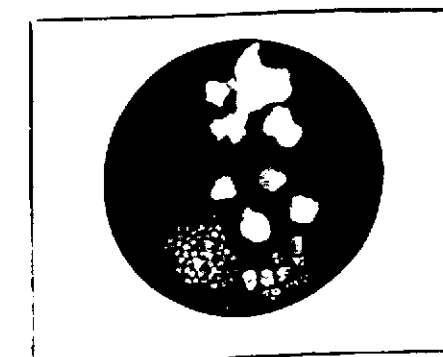


Fig. 377.—Comparison of renal and biliary calculi. The kidney stones are seen in the upper half.

6. When a large number of gall stones are present in the gall bladder the flow of bile in sufficient quantity necessary for the required concentration is wanting; it thus renders visualisation impossible or indifferent.

Interpretation of Results.—1. A shadow of the enlarged gall bladder as in Mucocoele may sometimes be obtained, though it can be made out by careful scrutiny. The relative fullness and the subsequent diminution and emptying of gall bladder will also give a clue to its physiological function.

2. The outline of the gall bladder will be deformed in case of inflammatory and other intrinsic and structural changes. Certain cases may show relatively sluggish filling and emptying due to defective hepatic excretion or to obstructive lesions.

3. A mottled appearance of the shadow may be due to a variety of causes. Gas in the hepatic flexure overlying the gall bladder very often produces a mottled appearance as also infiltration of calcium salts of the sub-mucous layer of the gall bladder (gall stone gravel).

4. In this test, if the dye has been administered orally, its presence in the alimentary tract explains the absence of gall bladder shadow, but if the dye has been administered intravenously a negative result leads us to question the efficiency of the liver or the patency of the ducts from pressure within or without.

In the majority of instances a fully formed normal Cholecystogram will show at its best when taken 14 hours after administration of the dye.

The intravenous route is a more satisfactory one as it does away with the uncertainty of results met with in cases of oral administration. But on account of the toxic reaction which follows the intravenous route, oral administration is more popular with the profession.

The following points are to be observed to ensure the best results in Cholecystography :—

Intravenous and Intraoral methods with Sodium Tetraiodophenolphthalein (S. T. I. P. P).—The S. T. I. P. P. administered must not exceed 3.5 grms.

Day previous to Examination.—A purgative should be given preferably Compound Liquorice powder or Prolagar in sufficient quantity in cases of irritable bowels, and no purgative at all when there is diarrhoea.

Castor Oil is an unsatisfactory preparatory purgative inasmuch as it gives rise to formation of gas by the subsequent allaying of the peristaltic activity of the bowels.

1st Day of Examination.—1. A cup of tea and a biscuit may be given early but no breakfast.

2. Film 1 of Gall Bladder area is to be taken as Control film.

3. Ordinary lunch may be given.

4. At 6 p.m.—a light supper without meat is to be given. The object is to avoid stimulating the liver. Well buttered bread in order to help the emptying of the gall bladder is to be given.

5. At 8 p.m.—(a) Intravenous method—S.T.I.P.P. to be administered intravenously.

(b) Intraoral method—S. T. I. P. P. capsules to be given.

In order to find out the idiosyncrasy of the patient to the drug 1 or 2 c.c. of the solution is injected and after half an hour if no reaction is noted, the remaining solution is injected.

In the case of oral administration of the capsules, if the keratin coating of the capsule is defective and the hydrochloric acid of the stomach comes in contact with the Bromine and Iodine salt a chloride is formed which does not cast a shadow. Sometimes it so happens that these capsules are not absorbed at all. In this case the desired result will not follow.

2nd Day of Examination.—1. The patient should report at the X-Ray Institute at 10 a.m. for film 2 to be taken.

2. The above film is developed and examined immediately. If a good shadow is obtained, 'liquid Barium' is given and the relationship of the pyloric end of the stomach and the duodenum to the gall bladder is determined by taking a third film.

Film 3 is taken—if no shadow is shown the examination of the gall bladder ceases but that of the pyloric end of the stomach and the duodenum should be carried on.

3. A meal rich in fats is then given and 2 to 4 hours later Film 4 is taken. The object of the fatty meal is to excite and partly empty the gall bladder.

3rd Day of Examination.—Film 5, 24 hours after liquid Barium to show Barium in colon and the relationship of the hepatic flexure to gall bladder.

Intravenous S.T.I.P.P.—3 grms. Sodium Tetraiodophenolphthalein (S.T.I.P.P.) is dissolved in 40 c.c. of freshly distilled water and the solution filtered through a fine filter and sterilised in a water bath for 15 minutes. This makes a 7.5% solution.

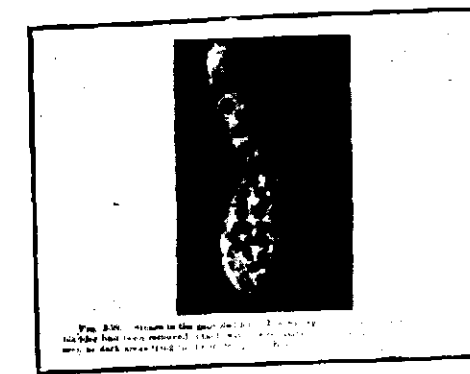


Fig. 353.—Stones in the gall-bladder. The roentgenogram was made after the gall-bladder had been removed intact, with its contained stones and bile. The stones are seen as dark areas lying in the more opaque bile.

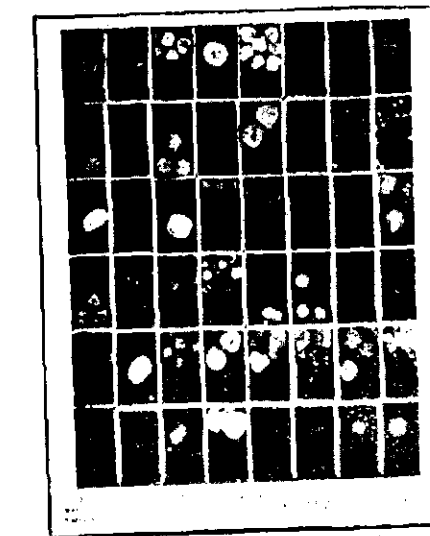
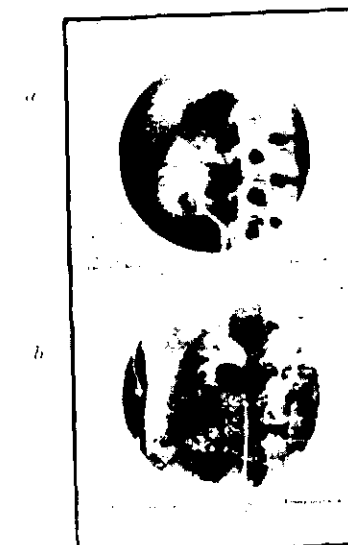


Fig. 355.—Gall-stones from forty-eight different cases. After removal the stones were put into small paste board boxes and roentgenographed on a single plate. Note the variability of size and density of the shadows.

TECHNIC

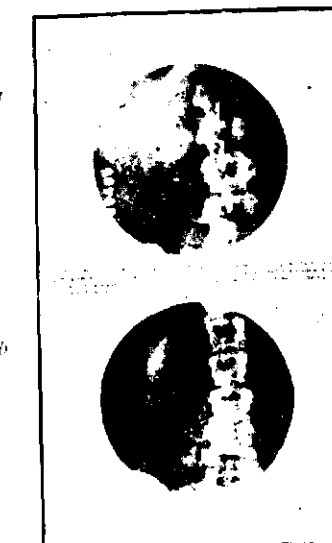
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(a) Fig. 360.—Renal calculus excluded by pycelogram. The auscular shadow of the gall-stone is pointed out by the arrows.

(b) Fig. 361.—Renal calculus excluded by pycelogram. *p*, kidney outline; *g*, gall stones at 8.

426 DISEASES OF THE GALL-BLADDER AND LIVER.



(a) Fig. 365.—Shadow in the gall-bladder region. Because of its atypical character a pycelogram was made to exclude a renal calculus. This being excluded, the shadow was thought to be a gall-stone. At operation it proved to be a desmoid tumour of the right rectus abdominis muscle.

(b) Fig. 366.—Case 133, 413, the arrow points to the stone shadows.

The injection is given intravenously, very slowly, care being taken not to allow extravasation outside the vein as induration of the tissues may be produced ; but, with this strength of solution no sloughing of the tissues takes place.

Intraoral S.T.I.P.P.—Keratin coated capsules, each containing 0.3 grms. of S.T.I.P.P. are used : 8 to 12 capsules are given according to the weight of the patient. The total quantity of S.T.I.P.P. should not exceed 3.5 grms., that is, about 12 capsules.

Two capsules should be swallowed by the patient, every 15 minutes, along with a drink of water to facilitate the passage of the capsules from the stomach on to the duodenum ; the patient should lie on the right side until all the capsules are taken with a similar object in view.

The same salt in the form of Keratinised granules under particular names "Shadocol", "Opacal," etc., has been used at the Government X-Ray Institute with very good results. This has the advantage of being taken all in one lot in a tumbler of water followed by frequent drinks of water to facilitate its entry into the duodenum with the least possible delay in stomach with a view to avoid the action of Hydrochloric acid on the granules.

Remarks.—The shadows in the gall bladder may be due to a variety of causes :—

1. A kidney stone of the soft variety, foreign bodies in the alimentary tract and other artifacts may simulate a gall stone shadow.

2. The density of the shadow, the relative position of the gall bladder, its mobility, its relative filling and emptying, its persistence or the alteration of its position after a purgative or enema and its relation to the duodenum and the Hepatic flexure as well as various other clinical factors should be taken into account before implicating or exonerating the gall bladder.

A negative result more often gives a clue to the real pathological lesion than a normal shadow after the administration of the dye.

A gall bladder lesion is very often intimately connected with pathological lesions involving the duodenum, stomach and other parts of the intestinal tract.

In certain cases a pyelogram may be necessary to identify the suspicious shadow.

Advanced diseases of liver involving destruction of tissue, complete obstruction of the cystic duct as evidenced by clay coloured

stools, unsplit fat, etc., are contra-indications. So are advanced diseases of kidneys and heart.

Photographs showing various pathological conditions of the gall bladder, its relation to the duodenum and the hepatic flexure and the shadows that may simulate gall stones are shown in the pictures published herewith.

REFERENCES.

- (1) *Carmen's Book on Alimentary Canal* from which most of the pictures have been taken.
- (2) *Graham and Cole's book on Diseases of the gall bladder.*
- (3) *Notes By Dr. J. M. Woodburne Morrison, M.D., F.R.C.P.*

Cancer of the Cervix Uterus

BY DR. I. G. K. MENON, M.B. & B.S.,

Department of Research, Government Hospital for Women and Children, Madras.

This paper deals mainly with the analysis of a series of 90 consecutive cases of Cancer of Cervix Uterus under treatment in the Government Hospital for Women and Children, Madras, during the course of the half year ending with June 30, 1930. One special characteristic, which distinguishes this from any other similar series generally reported, is that this not only includes, but is chiefly made up of cases so far advanced clinically as to be most probably refused admission to the gynæcological clinics of the West and classified as 'hopeless'.

Race.—Analysing the cases on the basis of the racial incidence, we get

	1930.		1929.	
	Number	Percentage.	Number	Percentage.
Hindus	82	91.1	111	76.6
Indian Christians	5	5.5	20	13.8
Anglo-Indians	3	3.3	9	6.2
Muhammadans	...	...	5	3.4

There does not seem to be any special predilection for cancer among any of these as the percentage incidence corresponds in fair degree to their percentage in the total number of admissions to the Hospital.

Age.—Here we find that the period, 35 to 39, claims the greatest percentage of victims 24.4 per cent with the 40 to 44 and 50 to 54 periods claiming an equal second place with 17.7 per cent each, the average age for the whole series being 41.97 years. It is interesting to compare these figures with those given in Lane Claypon's analysis of cancer cases, published by the Ministry of Health, England, 1927, which remains to day undoubtedly the most comprehensive survey of the literature dealing as it does with over 80,000 cases. The figures there, derived from a series of 7,381 cases from various countries, are 45.75 years for the average age and a greater incidence in the 40 to 44 and 45 to 49 periods. We find therefore an earlier incidence of cancer in our series.

90 cases.	Age periods	...	15	20	25	30	35	40	45	50	55	60	65	70	75
	Number of cases.	...	nil.	1	5	7	22	16	14	16	7	2	nil.	nil.	nil.
	Percentage	...	nil.	1.1	5.5	7.7	24.4	17.7	15.5	17.7	7.7	2.2	nil.	nil.	nil.
7,381 cases.	Number of cases.	...	3	33	269	667	1196	1474	1370	1034	691	395	134	49	13
	Percentage	...	.04	4.2	3.65	9.16	16.2	20.18	18.6	14.7	9.4	5.3	1.8	.7	1.7

Average age for 90 cases = 41.97 years.

" 7,381 cases = 45.75 years.

The highest age recorded in our series is 62 and the lowest 24. We had also two cases at twenty-five. The lowest age recorded in the hospital is 16. All these four cases were clinically far advanced, showing early onset of complications and it would seem that the prognosis in youthful patients is rather worse than in those of higher age. Details of these cases will be found in the list of interesting cases attached. One rather interesting observation from this age survey, which requires to be confirmed or refuted, as the case may be, by further figures, is that there is a clear difference in the average ages for Indians and Anglo-Indians of 15 years, the respective averages being 41 and 56.3 years. While it would be certainly unreliable to draw any general conclusion from such a small number of figures as 3 Anglo-Indians, I am raising this point so that in further work on this subject this question may be more fully considered. It has also to be noted that the analysis of 145 cases of Cancer Cervix of this hospital for 1929, with 9 Anglo-Indians and Europeans and 136 Indians, also reveals the same difference in ages, the corresponding figures being 58.6 for the former and 43.2 for the Indians. It may be that, perhaps, the lower vitality of the Indian patient of the type seen in the hospital as compared to that of the Anglo-Indian and European may be responsible for the earlier incidence of cancer among the former and that the lowering of vitality, local and general, usually brought about by old age but also by other factors as over function, irritation, etc., may be a more fundamental factor in the etiology of cancer than is at present allowed.

Heredity.—None of the cases gave any such history.

Civil State.—Of 80 cases considered from this aspect, there is only one instance of an unmarried woman developing cancer—a Hindu girl aged 24—with a percentage of 1.25 unmarried against 98.75 married. The above percentage, though derived from obviously insufficient data, tallies fairly closely with the percentage 2.1 given in Lane Claypon's series of 7,986 cases with its total of 170 unmarried. The obvious inference that Cancer of Cervix is more often associated with the

married state is of course a well known fact. An enquiry into the interval between marriage and the onset of cancer reveals that the average time is 26.01 years for Hindus, 31 years for Indian Christians and 37.3 years for Anglo-Indians. These figures do not seem to be of any practical importance.

Menstrual History.—Sixty-seven out of the 78 cases giving details about this point gave a regular menstrual history while nine complained of irregularity, one of profuse periods and one of scanty periods. Thirty-one patients, with a percentage of 39.7, had developed the disease after menopause, the average interval elapsing after menopause and before its onset being 6 years and five months for the series. The above figures do not point to any particular association of cancer either with irregularities of menstrual history or with the advent of menopause.

Fertility.—Eighty-two cases were considered with reference to pregnancy of which one (Hindu) was unmarried, and nulliparous, one (Hindu) married but had no pregnancy or abortion and the remaining 80 were parous, thus giving a percentage 97.6 for the parous element. The average number of pregnancies for this series, 5.03, is identical with the figure 5 given in Lane Claypon's series for 4,087 cases of cancer; it is also statistically equal to the figure, 5.4, obtained for the control series of patients without cancer, thus bearing out the lack of association of cancer of the cervix with the number of pregnancies. The percentage of 97.6, for the parous element, however, indicates the close association of the disease with the state of pregnancy. Schmitz of Chicago holds that it is the production of sepsis due to instrumental interruption of pregnancy, induced abortion, etc., that is of importance in the etiology and not the actual number of pregnancies. With regard to this view, it was found impossible to elicit any history of value from most cases in the hospital, though this point was specially kept in view in the course of the investigation and a strenuous attempt made to fish out the details. This difficulty will, I am sure, be easily appreciated by anybody who has had the least experience at eliciting any history from the ordinary type of female patients. We are not therefore in a position to say anything definite on the part played by obstetrical interference and sepsis in the etiology of cancer cervix. There is no doubt anyway, that pregnancy coming on cancer, makes the condition much worse. As for the idea of the apparent relation between abortion and cancer put forward by some workers, our figures, do not bear this out in any way—12 cases out of 80 a percentage of 15 for positive abortions and an average of 1.91

for the positive series and '3 for the whole series. These follow closely the figures in Dane Claypon's series of 1,165 women with 16 per cent positives, 2'2 average for positives and '36 for the whole series.

Syphilis.—Another line along which investigation was carried out was to find the association, if any, of cancer cervix with syphilis, but due to the lack of data for a control series of cases without cancer the figures obtained from Wassermann reactions are of no absolute value. They are any way given below :—

Total number examined	...	...	...	43
Wassermann negative	...	...	...	36 — 83'7%
.. Positive	...	...	...	7 — 16'2%
Positives { Strong	...	...	...	1
{ Moderate	...	...	...	3
{ Weak	...	...	...	3

Five cases out of 90 also showed a positive gonococcal finding in the vaginal smears.

Alleged duration of Symptoms.—The average duration of symptoms till admission, which is sure to be less than the real duration of the disease, has been found to be 6 months, 28 days for a series of 79 cases, this agreeing with 28'6 weeks given for European cases. It is patent however that the disease must have established itself long before the patient took any notice of her condition. This, in conjunction with the natural reticence or apathy of the patient in the matter of seeking medical advice and the common idea of the association of irregular bleeding with menopause, brings about the disastrous result that the patient comes to the hospital for treatment very often in a stage when absolutely nothing can be done for her. The outstanding fact that thus claims our attention here is the lamentably small number of women who come for treatment in an early stage of the disease. If to-day, then, there is any one thing more essential than others in the solving of the cancer problem in the Presidency, it is the education of the masses on the urgent necessity of early diagnosis and treatment of this disease, with a view to the more effective utilisation of the hospital as a place of treatment rather than as an asylum for the incurables, which unfortunately it is to-day. This statement will be more readily appreciated when it is pointed out that only 7 out of 90 cases with a percentage of 7'4 were in an operable stage, this comparing very unfavourably with the operability rate of 48'9 per cent arrived at from a survey of 11,682 cases from various Western clinics. The majority of our 'inoperable' cases come more properly under the heading 'hopeless' according to the standards of foreign clinics.

Microscopical Diagnosis.—It may be held as a serious drawback of the quality of the work reviewed in this paper that the diagnosis rests in most of the cases on clinical grounds and not on microscopical findings. Against this may be brought forward the argument that, in the few cases with uncertainty as to diagnosis, microscopical examinations were made and that, in the rest, the condition was so far advanced as to leave no possible doubts about it. Apart from this, however, the dictum laid down by H. Spencer, M.D., at a cancer conference before the Medical Society of London, that no case should be accepted as cancer which has not been examined microscopically by experts in gynaecological pathology, cannot be accepted as the last word on the subject to-day. Many surgeons and radiologists now consider that any disturbance of the growth before operation or radiation, specially in the form of section cutting or curetting, is prejudicial to the patient's chances due to the real danger of dissemination of the disease. Risley, Leland Doderlein, and Bowing of Mayo Clinic, Heynemann and others all support this view. Cases are also recorded by Jung, 1909, and Heynemann, 1921, of death due to peritonitis following biopsy. Ochsner mentions that even early cases, when interfered with in this way, show rapid metastasis and adds that the experienced surgeon should be able to make a diagnosis without removing a piece of the growth. The opinion again of an authority like Heynemann of Stockholm that the results of the famous Stockholm clinic with radium have improved since they ceased to take tissue for microscopical examination would certainly make one pause before interfering with a case of cancer in which the clinical diagnosis is not difficult.

Symptoms and Complications.—The three cardinal symptoms of this condition are haemorrhage and discharge per vaginam and pain. All the patients invariably complained of one or varying combination of these three. Of these, haemorrhage, more often irregular in type, is the most common complaint and the one that first attracts the notice of the patient. Next in order of frequency comes vaginal discharge very often offensive, while actual pain at the site seems to be rather rare. Backache, pain in the thighs, legs, etc., are more properly of the nature of pressure effects at a later stage of the disease. All this has been expressed in figures in Lane Claypon's survey of 3,163 cases in which 61'6 per cent complained of bleeding only, 20'6 per cent of vaginal discharge, and 8'2 of pain while 4'1 complained of bleeding and discharge, 3'4 of bleeding and pain and 2'1 of discharge and pain, all cases with bleeding taken together amounting to 69'1 per cent of the total.

Only seven out of 90 cases giving a percentage of 7.7 showed a positive result as to the occurrence of enlarged glands secondary to cancer. The difficulty of detecting by physical examination only, enlarged pelvic glands, and the rarity of involvement of the inguinal glands when the cervix alone is affected, may account for this small percentage; and there was hardly any opportunity for us to examine microscopically any of the pelvic glands and determine the percentage showing cancerous elements. The rarity of glandular involvement in cancer cervix as compared to that at other sites has been demonstrated by other workers too. It has moreover been established that all these enlarged glands are not cancerous, about 30 per cent from a series of 1,200 examined showing septic enlarged glands without any element of cancer. The same fact is observed also in the case of the broad ligament and parametrium, the induration of which structures, generally supposed to be due to cancerous infiltration, is very often due to inflammatory changes following on sepsis. The post-mortem examination of pelvic glands in a series of 1,325 cases showed only 37.3 per cent with cancerous deposits, thus proving that glandular involvement, even in the last stages of the disease, takes place only in a third of the cases and agreeing with our own finding.

As a logical sequence to the frequency of haemorrhage in cancer, we find that anaemia is by far the commonest complication, 23 cases out of 90 with a percentage of 25.5 showing marked anaemia, 6 of them being of severe type. In fact one clinically early and operable case of cancer cervix was rendered unfit for operation solely on account of the severe anaemia. Next in order of frequency as complications are, difficulty of micturition in 13 cases (14.4 per cent), pain shooting down the thighs and legs in 12 cases (13.3 per cent), glandular involvement in 7 cases (7.7 per cent), and oedema of the feet in 3 cases (3.3 per cent). There were also 5 cases with vesico-vaginal fistulae and 4 with recto-vaginal fistulae, 2 of them showing both complications together. Of other diseases complicating cancer, we had 4 cases of glossitis, 3 of myocarditis (perhaps following anaemia), 2 of mental instability (?), 1 of pulmonary tuberculosis and 1 with a very large ovarian cyst. There were also 2 cases of pregnancy with cancer, details of which are given in the list of cases appended. Another common complication was the irregular fever due to septic absorption which, in many cases, cleared up with anti septic vaginal douches, thrice daily.

Treatment Palliative.—The administration of sedatives, analgesics and hypnotics as bromides, chloral, salicylates, veramon, opium, etc.,

forms perhaps the most important part of such treatment. The effect of any particular drug on the system wears off very soon and increasing doses have to be given. This raises the question of when best to start giving such drugs in the course of the disease and of how long it is advisable to continue the administration of such depressants to a system already weakened by disease. The difficulty however is that very often the only thing that a doctor can do is 'to ease the passage to the grave.' The routine practice of anti-septic vaginal douches twice or thrice daily is of the utmost importance in preventing the effects of septic absorption. It may also be mentioned that bleeding per vaginum, not controlled by oral calcium, hot vaginal douches, plugging, and other measures, is often controlled effectively by a vaginal douche with calcium chloride lotion, strength 1 in 60. Tannic acid douches also may be tried.

Treatment—Operative.—As pointed out above, most of our cases were far too advanced for operation. The series however included five cases which had previously undergone some form of operative treatment; but, as a sufficient interval of time had not elapsed since operation, to think of a cure on a three or five year basis, no percentage has been worked out on these. They are mentioned in the list attached. The advanced stage of the disease, for one, and the natural hesitation on the part of the patient to undergo an operation, together render the possibility of operative treatment rather rare. Of the operative procedures are amputation of the cervix, vaginal hysterectomy and abdominal hysterectomy, the last one is undoubtedly most effective and the one done in this hospital.

Radium therapy.—While the results of abdominal hysterectomy and radium therapy on a five years "cure" basis are almost equally good in operable cases, radium therapy is responsible for a further cure of 12 per cent of cases in the inoperable series. Radium therapy thus certainly gets the better over operative treatment, specially when the operative mortality of 17.3 per cent, even in the hands of clever surgeons, is compared with the absence of mortality with radium. Of 90 cases, 54 were treated with radium—60 per cent—30 cases with one, 18 with two and 6 with three exposures each, giving thus a total of 84 exposures. The routine method of treatment employed was the intracervical application of the radium tubes contained in a cylinder of Monel metal, of 1.5 millimetre thickness, with a long flexible stem brought outside the vagina and kept in position with adhesive tape fixed to the patient's abdominal wall. The strength used was 50 mgms of radium sulphate, with an

element content of 35 mgms, over a period of 48 hours for the first exposure, with, of course, individual variations according to the merits of the case. Twenty-four out of the 54 patients—44 per cent—showed varying degrees of radium reaction, either immediate or delayed. A more detailed study of the technic, effects and reactions of radium therapy is given in a second paper.

Results.—It is certainly premature to talk of the results of treatment administered during the course of this year when discussing such a disease as cancer cervix. The figures given below are therefore not of absolute importance except as an index of the immediate effect of treatment:—

	Number of cases 90.		Number of cases treated with Radium 54.	
	Number.	Percentage.	Number.	Percentage.
Deaths	5	5.5	3	5.5
Discharged against medical advice.	31	34	5	9.2
Unfit for further treatment	4	4.4	2	3.8
No appreciable change	4	4.4	3	5.5
Relieved	40	44.4	38	70.3
Still in hospital after June 1930	6	6.6	3	5.5

The problem of getting sufficient data for considering the end results of treatment, on the basis of a three or five years' freedom from symptoms, is a very difficult one as it involves the task of keeping in touch with patients or their relatives after discharge from hospital over such long periods.

There is no doubt that radium therapy is to-day the treatment of choice for cancer cervix and that, with further improvements in technic, more of available radium for use, and an earlier starting of treatment, much may be hoped for in the amelioration at least, if not the complete cure, of what remains to-day the most dreaded disease of women.

Before concluding this paper, I would like to express my thanks and gratitude to Col. Hingston, I.M.S., and Dr. Lakshmanaswami Mudaliar, M.D., for their permission and encouragement to work on this subject in the hospital and also for the help they rendered me at every stage of the work by their valuable advice.

Case Reports—early incidence.

1. A.—Hindu age 25. Married 13 years ago. 4 pregnancies. Duration 13 months. General condition weak. Locally, extensive proliferating cancer with excavating ulcer in the centre. Infiltration of anterior and posterior vaginal walls and both fornices and left broad ligament. Developed a recto vaginal fistula 1 month after admission. Discharged after 3 applications of Radium without any marked change.

2. V.—Hindu age 25. Married 10 years ago. 2 pregnancies. General condition fair. Locally, cauliflower growth involving anterior vaginal wall and fornix, with crateriform ulcer fixing the posterior fornix. Discharged against medical advice after one Radium application, slightly relieved.

3. S. D.—Hindu age 24. Unmarried and nulliparous. Duration 6 months. Locally, cauliflower type of cancer cervix, with extensive involvement of anterior vaginal wall and commencing infiltration of lateral fornices. Severe pain. Discharged against medical advice after one radium application, slightly relieved.

Association of pregnancy with cancer.

4. S.—Hindu age 37. Married 30 years ago. Regular periods. 9 pregnancies, 1 abortion. Irregular bleeding since 6th month of last pregnancy. Profuse bleeding a day before and for 1 week after confinement. Delayed labour hastened by pituitrin. Relief for 2 weeks and since then, continuous bleeding for 5 months till admission. Locally, excavating ulcer of the cervix, with infiltration of anterior vaginal wall. Hard proliferating mass also present. Discharged after slightly relieved, after 2 Radium applications. Died 1 month after discharge from hospital.

5. K.—Hindu age 35. Married 20 years ago. Regular periods. 6 pregnancies. Bleeding P. V. and pain 3 years ago when 5 months pregnant. Antepartum hæmorrhage and still birth. Relief for 6 months after confinement, with recurrence of bleeding in 4th month of next pregnancy. Antepartum hæmorrhage again, with delayed labour terminated by forceps delivery. Relief from symptoms for 4 months followed by continuous bleeding. Admitted in a collapsed condition. Locally, cauliflower growth of cervix, involving whole vaginal vault and parametrium. Uterus fixed. Difficulty of micturition. Developed V. V. F. within a week and R. V. F. within 8 weeks after admission. Discharged unfit for further Radium treatment after one application.

6. M.—Hindu age 29. Ninth para, first five pregnancies natural, 6th and 7th forceps deliveries with dead children, 8th natural. Admitted for bleeding, uterus 9 month's size. P. V. os admits one finger. Cervix eroded and cancerous. Presenting part high up. Advised Caesarean Section and hysterectomy. Patient refused operation and discharged.

7. D.—Hindu age 33. Married 23 years ago. Periods regular. Five deliveries, all by forceps in this hospital, one attended with sepsis. Admitted for 3 months amenorrhœa followed by bleeding for one week. Hard nodular cervix bleeding readily to touch, uterus enlarged and of 3 months' size. Patient absconded before further investigation and treatment.

The Liver and Coagulation of Blood

WITH SPECIAL REFERENCE TO THE STUDY OF LIVER EFFICIENCY

BY K. C. PAUL, M.B., B.S.,

Sixth Physician, General Hospital, Madras.

The body safeguards against continuance of the loss of blood from a ruptured blood vessel by the formation of a clot which plugs the lumen of the vessel at the seat of injury. The formation of this clot is due to the property the blood possesses of coagulating when liberated from the vascular channels.

It has been known for a long time that the coagulability of the blood is impaired in certain diseases of the liver. In seeking for the explanation of this impaired coagulability, Doyon, Gautier, and Morel¹¹ noted that in the dog the blood became incoagulable after total removal of the liver. Other observations also there are to suggest that the liver plays some part in relation to the coagulability of the blood. What this part is will be discussed below.

Coagulation of blood consists essentially in the conversion of the soluble fibrinogen of the blood into insoluble fibrin which forms the basis of the clot. If fibrinogen is absent from the blood, clotting will not take place; if it is only diminished in amount, clotting may occur, but the clot formed, instead of being firm, will be, as Whipple and Hurwitz⁴⁸ have shown, soft and tenuous. Several factors participate in bringing about the conversion of fibrinogen into fibrin, but before we discuss these let us enquire whether any relation exists between the liver and the fibrinogen content of the blood.

The Liver and Blood Fibrinogen.—The fibrinogen of the blood is a simple protein of the globulin group. It is believed at the present day that it is produced in, or under the direct influence of, the liver. The site of its origin has, however, been the subject of considerable controversy in the past. Mathews⁸¹ has held that it is produced by the leucocytes of the blood. According to Goodpasture,¹⁶ it is formed by the combined activity of the liver and the intestines. Others have suggested

that it has its origin in the lungs or bone-marrow. The view that is accepted to-day was originally put forward by Doyon¹⁰ and later amplified by Whipple and Hurwitz. Whipple and Hurwitz maintain that "fibrinogen is either formed in the liver or is wholly dependent upon liver activity for its production."

Corin and Ansiaux,⁷ in 1894, showed that fibrinogen was absent from the blood of animals poisoned with phosphorus. Jacoby²³ confirmed this observation in 1900. Doyon, Morel, and Kareff,¹² in 1905, suggested that the disappearance of fibrinogen from the blood of animals poisoned with phosphorus was due to the changes occurring in the liver. Doyon¹⁰ showed also that in dogs the ingestion of large doses of chloroform induced necrosis of the liver, and that this necrosis was associated with a marked decrease in the fibrinogen content of the blood. Whipple and Hurwitz found that the central necrosis of the liver, produced by prolonged chloroform anaesthesia, was invariably associated with a drop in the fibrinogen content of the blood, that this drop corresponded to the extent of the liver injury, and that, with regeneration of the liver, the blood fibrinogen rose to the normal level, and in some cases even much higher. They attribute the hæmorrhagic tendency met with in animals with liver necrosis to the great diminution in blood fibrinogen, which permits only of the formation of clots, too soft and tenuous to stop even capillary oozing. Whipple, Mason, and Peightal⁵⁰ have confirmed these observations. Recently Foster and Whipple¹⁵ have found that with mild injury to the liver there is an immediate rise in blood fibrinogen. They have ascribed this to a stimulating effect such an injury has on the fibrinogen-forming function of the liver. Extensive injury to the liver tissue has been found to lead invariably to a marked fall in the blood fibrinogen. These results have obtained confirmation from the researches of Schultz, Nicholes, and Schaefer,⁴² who have shown that carbon tetrachloride poisoning, which produces central necrosis of the liver, is associated with a marked fall in the fibrinogen content of the blood.

But Mann and Bollmann³⁰ were unable to demonstrate consistent changes in the blood fibrinogen of dehepatized animals. In the animals with greatly reduced hepatic tissue, they found that the blood fibrinogen tended to be rather low. Rosenthal, Licht, and Melchior⁴⁹ have, however, noted an almost total disappearance of fibrinogen from the blood about fourteen hours after total hepatectomy.

Whipple and Hurwitz suggested that the amount of fibrinogen in the blood would be a "good indicator of the liver efficiency and a fairly

accurate index of the amount of liver injury." Whipple⁴⁸ noted that in some cases of cirrhosis of the liver the clotting time of the blood was prolonged and its fibrinogen content was low. According to Whipple, Mason, and Peightal, in this disease the blood fibrinogen is often below the normal level, and at times very low. They are of opinion that the fall in blood fibrinogen to a very low level is invariably an indication of a seriously advanced condition of liver damage. Rowntree, Marshall, and Chesney⁴¹ found that the study of the fibrinogen content of the blood was helpful in assessing liver function. Guijarro¹⁹ regards the amount of fibrinogen in the blood as a fairly reliable index of the functional state of the hepatic parenchyma.

The absence of methods suitable for clinical work has been a direct hindrance to the study of blood fibrinogen in hepatic conditions. In recent years, methods which could be employed in the clinical laboratory have been evolved. Foster and Whipple¹² have devised a comparatively simple gravimetric method which is suitable for accurate work. But the colorimetric procedure introduced by Hisien Wu⁵¹ seems to be better adapted for routine clinical employment.

Recent clinical studies on the fibrinogen content of the blood have been made by McLester³⁰ and Foster.¹⁸ A summary of the more important of their observations is given below.

The following table is compiled from the figures given by Foster:—

		Fibrin Values : in mgm. per 100 c.cm.	
		Blood.	Plasma.
Normal Men :			
Maximum	...	188	382
Minimum	...	138	282
Average	...	163	332
Normal Women :			
Maximum	...	204	394
Minimum	...	154	294
Average	...	179	344
Pregnant Women :			
Average	...	273	415

McLester, Davidson, and Frazier³⁰ say that the fibrin value of the plasma in normal individuals varies from 250 to 400 mgm. per 100 c.cm. But, as McLester has found, the value is fairly constant in the same individual when in health. According to Whipple, Mason, and Peightal,

the normal fibrinogen content of the plasma lies between 300 and 400 mgm. per 100 c.cm.

Foster says that the fibrin values given for pregnant women will probably be found to hold true only for the last months of gestation.

Very high values for blood and plasma fibrin were obtained in cases of lobar pneumonia. In some of them the plasma fibrin was higher than 1,000 mgm. per 100 c.cm. In other inflammatory conditions also increased fibrin values have been noted.

Low fibrin values were obtained by McLester, Davidson, and Frazier in cases of typhoid fever and anaemia.

It has been previously stated that Foster and Whipple have shown that marked damage to the hepatic parenchyma is associated with a low fibrinogen content of the blood. McLester also has observed a like association. Foster estimated the fibrin yield of the blood and plasma in two cases of acute yellow atrophy and found this very low. Whipple, Mason, and Peightal found that in certain cases of cirrhosis of the liver the fibrinogen content of the plasma was 50 mgm. or even less per 100 c.cm. According to them, "This is not an invariable finding in the disease, but when present is of the gravest prognostic import." Weltmann and Neumayer⁴⁶ have observed that diffuse affections of the liver are associated with low fibrinogen content of the blood.

McLester, Davidson, and Frazier hold that the liver possesses a large margin of safety with regard to the fibrinogen forming function. Carlson⁵ says that but 15 or 20 per cent of normal hepatic tissue is sufficient to carry on this function under ordinary conditions. Low fibrin yields are not, therefore, to be expected in cases of hepatic disease where between 20 and 25 per cent. of functioning liver tissue still remains.

In certain diseases of the liver the blood fibrinogen, instead of being low, is raised, and, as has been mentioned already, Foster and Whipple have found that with mild injury to the liver, such as may be produced by the administration of small doses of liver poisons, there is an immediate rise in blood fibrinogen. Foster has noted that in non-fatal cases of arseno-benzol jaundice the fibrin yield of the blood and plasma is considerably increased. Weltmann and Neumayer have found that the blood fibrinogen is increased in local inflammatory lesions and neoplastic diseases of the liver. As stated before, Foster and Whipple have explained these increases in blood fibrinogen as the effect of stimulation of the fibrinogen forming function of the liver. Such stimulation may result from any irritative lesion of the organ.

DeWesselow and Wyatt¹⁷ and Foster have noted that in the toxæmias of pregnancy (eclampsia) the fibrinogen content of the blood is raised. Foster suggests that the study of the blood fibrinogen may serve to differentiate the cases in which the toxic manifestations are due to nephritis from the true toxæmias (which, in her opinion, are hepatic in origin), for in the nephritic cases the blood fibrinogen is within normal limits.

It will be understood from the foregoing that the liver is most probably the seat of origin of the fibrinogen of the blood, and that in hepatic disease alterations in the fibrinogen content of the blood may occur. The alterations occurring in hepatic disease are, however, only of limited value in diagnosis. A low content of blood fibrinogen has more significance than a raised one, for it indicates almost invariably hepatic insufficiency. But a lowering of the blood fibrinogen can be expected only in gross degenerative affections of the liver, such as acute yellow atrophy and advanced cirrhosis, and in these a diagnosis is possible on clinical grounds.

Fibrinolysis.—It is believed that there is present in the globulin fraction of the blood plasma a proteolytic ferment which has the property of digesting blood clots. This ferment, which acts on fibrin and brings about fibrinolysis, is, in normal blood, prevented from exerting its action (on any clot formed) by some inhibitory substance, formed probably by the liver. Because of this inhibition, normal blood does not digest its clot, if kept aseptically, even after several days. But when the liver is severely damaged, as in phosphorus poisoning, or is excluded from the circulation, the blood digests its clot rapidly.

The determination of the fibrinolytic activity of the blood is not without clinical interest. Goodpasture¹⁷ has shown that the blood from cases of atrophic cirrhosis of the liver will digest its clot within a few hours. He has found that this property of the pathological blood can be destroyed by heat, and to some extent checked by the addition of old plasma or normal serum. According to him, the hæmorrhagic tendency met with in some cases of hepatic cirrhosis is in part due to the digestion of clots *in vivo*. Rowntree, Marshall, and Chesney found the fibrinolytic activity of the blood increased in 7 of their 14 cases of hepatic cirrhosis, but not in any other condition.

Coagulation Factors: Theories of Blood Coagulation.—As has been stated previously, the essential part of blood coagulation is the conversion of the soluble fibrinogen of the blood into insoluble fibrin. According to the generally accepted ideas, this is brought about by the

action of a ferment, *fibrin-ferment* or *thrombin*, on fibrinogen. Thrombin does not exist in the blood as such, but appears there as a pro-enzyme, *thrombogen* or *prothrombin*. Coagulation can occur only if prothrombin becomes activated into thrombin. The manner in which the activation of prothrombin is brought about has been explained in various ways.

According to Morawitz,²⁴ prothrombin is activated into thrombin by a *kinase*, *thrombokinese*, acting in the presence of calcium salts. This substance is not present in the circulating blood, but makes its appearance only when blood is shed.

Howell²⁵ maintains that a kinase does not take part in the activation of thrombin. He believes that when prothrombin establishes contact with calcium salts, it changes into thrombin. In the circulating blood, there is present a substance called *antithrombin*, which prevents prothrombin from coming into contact with the calcium salts; because of this, blood remains fluid in the blood vessels. In shed blood, another substance, *thromboplastin*, which is powerfully antagonistic to antithrombin, appears. This substance neutralizes, or destroys, antithrombin, and thereby facilitates the interaction between prothrombin and calcium salts.

Howell has prepared a substance called *heparin*, which he holds converts the pro-antithrombin present in blood plasma into antithrombin. Heparin is formed mainly in the liver; other tissues contain but small amounts. As antithrombin is the chief agent in preventing the clotting of blood, the liver, through heparin, comes to play an important part in the maintenance of the fluidity of the circulating blood. Pickering and Hewitt²⁶ hold, however, that antithrombins are produced by the hydrolysis of proteins and that the liver has nothing to do with the maintenance of the fluidity of the circulating blood or with blood coagulation.

Among other theories put forward to explain the phenomenon of blood coagulation are those of Bordet,² Nolf,²⁷ Pickering,²⁷ and Mills.²⁸ It is not proposed to discuss any of these here. For our present purpose we shall accept Howell's theory, for, as Wells⁴⁵ says, it seems "to fit well with both experimental and clinical observations on the variations in the coagulability of the blood."

Coagulation Time and Its Determination.—When blood is shed, it begins to clot more or less rapidly, and the process becomes complete within a few minutes. The time which the blood takes, after it has escaped from the blood vessel, to become coagulated is termed the "coagulation time." The determination of this time is often of considerable clinical importance.

There are many methods available for the determination of the coagulation time of the blood. Addis¹ and Cohen² have critically examined several of these methods. The more important of these are those devised by Wright, Brodie and Russell³, McGowan⁴, Milian, Dale and Laidlaw⁵, and Howell. Addis's modification of the method of Brodie and Russell is accurate, but complicated; the method of Howell requires a large amount of blood. For clinical purposes, the method of Wright or of Dale and Laidlaw is suitable: Wright's method is however not accurate enough. The method of Dale and Laidlaw is not only simple but also accurate; repeated observations with it on samples of blood from the same person have given consistent results at the same temperature. It can be easily performed even at the bed-side.

The results obtained with the different methods show considerable variations even with normal blood. The temperature at which the coagulation time is determined is also very important. To obtain comparable results the same method should be employed in every instance and the readings should be made at the same temperature.

Brodie and Russell found that with their method the coagulation time of normal blood was 3 min. 49 sec. at 38°C., and 8 min. at 20°C. Addis¹, with his modification of their method, noted the time to be 1 min. 40 sec. at 38°C., 3 min. 40 sec. at 26°C., and 5 min. 22 sec. at 20.5°C. The same observer, using a modification of McGowan's method, got an average clotting time of 9 min. 50 sec. for his own blood at a temperature of 20°C. With Wright's method, the normal coagulation time is held to lie between 3 and 4 minutes at blood heat. Dale and Laidlaw give the following figures as normal for the temperatures indicated: 40°C., 1 min. 39 sec., 38°C., 1 min. 42 sec., 35°C., 1 min. 51 sec., 22°C., 5 min. 13 sec. Gram¹⁸, using a method of his own, found that the clotting time of normal blood was between 3 and 8 minutes at 35°C.

Coagulation Time in Pathological Conditions.—A prolongation of the coagulation time is met with in various pathological conditions, of which the most important is the inherited disorder hæmophilia. Among others are the acute exanthemata, septicæmia, melaena neonatorum, some cases of idiopathic purpura, and also, as Dochez⁹ and Minot and Lee²⁰ have shown, pneumonia.

The hepatic conditions which show prolongation in clotting time are acute yellow atrophy, phosphorus and chloroform poisoning, obstructive jaundice of some weeks' duration, and atrophic cirrhosis.

In acute yellow atrophy decreased coagulability of the blood is the rule. The blood from some cases may not clot at all. The deficient coagulability is due not only to the diminution of blood fibrinogen, but also to a deficiency in prothrombin. Probably the *anti-coagulant*, *heparin*, is also liberated in excess when necrosis of the hepatic parenchyma takes place. The blood from cases of phosphorus poisoning may be non-coagulable; this is due to the absence of fibrinogen from the blood. Delay in coagulation may not occur in all cases of chloroform poisoning; but, as previously stated, the clots formed in every case are soft and tenuous.

The coagulation time is not affected in all cases of hepatic cirrhosis. It may be prolonged in some cases, as Whipple noted, on account of the low fibrinogen content of the blood.

Cases of long standing jaundice of the obstructive type show a marked delay in blood coagulation; in some instance the blood may take 15 or 20 minutes to clot (Osler²⁶). The diminished coagulability of the blood in these cases is probably due to a deficiency in the calcium salts available for the activation of prothrombin into thrombin. (Wangenstein²⁷ has recently reviewed the subject exhaustively).

King and Stewart²⁸ found that injections of bile into animals increased the tone of the vagi and induced slowing of the pulse; when bile salts only were used this effect was not observed. From this they concluded that bile pigment was responsible for the toxic effect. They also noted that bile pigment when combined with calcium or sodium was not so toxic as when free, and that the blood of patients and animals with obstructive jaundice contained larger amounts of calcium than normal. They suggested that the increase in calcium was due to a protective mechanism, and that the calcium was bound to the bile pigment to make it less toxic. King, Bigelow, and Pearce²⁴ considered that the calcium was drawn from the tissues, especially bone, and that the binding of the calcium salts was responsible for the delay in coagulation. They say that "the calcium pigment salt is carried to the kidney, the pigment is passed into the urine in large quantities, but the calcium in quantities, which are only slightly, if at all, increased." In their experimental animals with obstructive jaundice, they found no decrease in blood fibrinogen. Lee and Vincent²⁶ noted that delayed coagulation became evident in cases of obstructive jaundice only after the condition had been in existence for, on an average, five weeks. They found that prolonged oral administration of calcium salts was effective in lowering the coagulation time.

The practical importance of these observations has been amply demonstrated in the pre-operative preparation of jaundiced patients. Walters and Mayo⁴⁸ found that the administration of calcium salts for some days preceding the surgical intervention was a satisfactory means of checking the incidence of post-operative haemorrhage in jaundiced subjects. Before such precautionary measures were adopted a not uncommon danger of operations on the jaundiced was the onset of post-operative bleeding.

Ravdin, Riegel, and Morrison³⁹ have recently stated that the delay in coagulation occurring in jaundice does not depend upon any deficiency in available calcium. Gunther and Greenberg²⁰ also hold the same opinion.

It is possible that the delay in coagulation is due to the retention of the bile salts in the blood. Contrary to the opinion of King and Stewart are the observations of Croftan, Horral, and others, which definitely show that the bile salts are extremely toxic substances; and Haessler and Stebbins²¹ have found that bile salts may retard the coagulation of blood by interfering with the conversion of fibrinogen into fibrin.

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The Clinical Examination for Venereal Disease

BY DR. R. V. RAJAM, M.S.,

Venereal Department, General Hospital.

The clinical examination for Venereal Disease should be systematic, minute and complete. The qualities required for successful practice in this speciality are :

- (1) An 'alert suspiciousness of mind' irrespective of the history and social status of the patient.
- (2) A broad sympathy and understanding, capable of infusing confidence in the patient.
- (3) Absence of assumption of any moral superiority.
- (4) Absolute secrecy in examination and treatment.

The venereal patient should not be regarded in the light of a moral delinquent, but should be dealt with in a matter of fact way, but, considerably.

The asking of questions and eliciting a history of the case, should, if possible, be postponed till the objective examination is finished. The majority of the patients never lie cold bloodedly and even in a few refractory juvenile cases, a little tact and familiar easy conversation will bring out the real history of the case. For the medical man, venereal disease is principally a biological accident, the result of contact of mucous surfaces with an abundance of moisture and favourable conditions for anaerobiosis. The venereal patient approaches the doctor with considerable moral shame and mental depression and the doctor should never do anything by word or action to increase his discomfiture. Happily, the 16th century practice of whipping on arrival and departure of a venereal patient, is past history and the modern venereologist is more humane than his forefathers. In taking down a correct history, there are certain pit falls to be guarded against :—

- (1) The dates of the three last exposures should be obtained.
- (2) The patient might not have had a visible lesion, especially true in the case of women.
- (3) The patient might have had, but, forgotten due to the lapse of time or wrongly interpreted his condition.

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(4) The patient distrusts the examiner who may not by his appearance and tone, infuse confidence.

Equipment Required.—A pair of rubber gloves, a bowl of antiseptic lotion, small square dry pieces of lint, cotton wool in kutchies, clean glass slides and cover slips, glass marking pencil, a bottle of vaseline, saline and urine glasses.

The first essential in examining a case is to make the patient strip himself completely. This is easily done in males, but, in females, it is embarrassing and will certainly frighten them. The latter may be examined completely without unduly exposing them. The second requisite is a sufficiency of day light in the examining room. Artificial light gives rise to deceptive appearances especially in looking for the finer cutaneous manifestations of Syphilis. The examiner should invariably protect his hands with gloves. The males may be examined standing, but, the females should always be examined lying in an operation couch or special examining genito-urinary table.

As the patient is entering the examination room, watch for any peculiarities of gait and facial expressions. Find out the chief complaint for which the patient seeks treatment.

In the Male—Genital Region.—The examination should be conducted with the examiner sitting, facing the patient who is standing. Inspect and examine the shaft of the penis, prepuce, coronal sulcus, frenum, glans, meatus and urethra for evidence of sore, discharge or scar. If there are sores, determine their situation, number, the presence of induration and pain, the character of their edges and base. When the sores are clean looking, and not previously treated, a drop of the serum from the deeper parts of the sore should be taken for dark ground examination. The method of taking the serum is as follows :—

With a dry piece of lint, repeatedly clean the sore. Grasp the sore beyond the edge with the index finger and thumb of the left hand, and pinch fairly firmly until the base bleeds slightly when pressure is released. Release and make pressure on the lesion several times, wipe off blood, and wait till clear serum exudes. Take a clean cover slip and touch the cover slip to the clear serum. Place the cover slip on to a slide and press the latter on blotting paper firmly and uniformly to get an even thin smear. Rinse the edges of the cover slip with vaseline to prevent air currents. The slide is now ready for dark ground examination. In lesions which are dirty or treated, saline dressing for 24 hours should be put on before it is dark fielded. When

there is purulent discharge, make sure whether it is urethral or sub preputal. With narrow phimotic foreskin, a dorsal slit may be necessary to determine the source of the discharge. In the case of urethral discharge, note its colour and consistency. Take a thin even smear on a slide for examination by Gram's stain. It is important to cleanse the glans and meatus thoroughly before taking the specimen from the inside of the meatus. Never fail to examine for the presence of infected para urethral ducts and Tyson's glands. The former are minute ducts opening just either inside or outside the lips of the meatus. The Tyson gland openings are larger and situated on either side of the frenum. Both of them are fruitful sources for reinfection and chronicity. These ducts are often associated with the balanitic form of hypospodiasis and pin hole meatus. Palpate the meatus and glandular portion of the urethra, ventro-dorsally, for evidence of induration. Otherwise a meatal or urethral chancre is easily overlooked. Inspect and palpate the shaft of the penis for enlargement of the dorsal lymphatic. Run your finger along the under surface and feel for any periurethral induration or abscess. Examine the anterior surface and sides of the scrotum for scars, adhesions and moist papules and condylomata. The cord, testis and epididymis should be routinely examined for thickening, nodules, tenderness, etc., Inspect and palpate the groins for enlarged lymphatic glands.

In the female, the examination of both genital and anal regions may be conveniently conducted in the lithotomy position. Inspect the mons veneris, labia, perineum and perianal regions. Alopecia of the pubic region, is, according to Fournier, may be the only sign of early Syphilis in women. The labia should be palpated for thickening, scarring, abscess, etc. Grasping the posterior third of the labia, on both sides, with the index finger and thumb, determine the presence of a pathological Bartholini's gland. (The normal gland is not palpable). Gently separate the labia, and look for urethral and vaginal discharge. Note the condition of the urinary meatus and the edges of the hymen. If there is no visible discharge from the urethra, pass your finger along the anterior vaginal wall and press from behind forwards, when a bead of pus may appear at the meatus. Introduce the index and middle finger of your left hand into the vagina and feel for any abnormality. Examination of the cervix should be conducted with the aid of a speculum. Note the condition of the cervix for erosions, ulcerations, congestion and discharge. If there is any suspicion of deep seated infection, bimanual

examination will help to detect enlarged and tender pus tubes. Examine the perineum and anal region for the presence of moist papules. Condylomata and fissures. Digital examination of the anal canal and rectum should never be omitted in women, for the detection of ulceration, stricture and papillomatous formations.

Examination of the upper extremities, head and face.—The patient is asked to stretch his arms with palm upwards. Inspect the flexor surfaces for cutaneous rash. Feel for the epitrochlear. Turn the arms and examine the extensor surfaces, the nails and interdigital clefts. The joints should be examined for swelling, pain and limitation of movements. Gently squeeze the arm at various levels to detect tenderness (Periosteal.) Inspect and palpate the axilla for enlarged glands and moist papules. Examine the scalp, especially the temporal and occipital regions for alopecia. In the case of children, feel for bosses, softening and sutural thickening. Note the facies. Inspect the eyes for congestion, drooping of the upper lid and squint. Examine for cloudiness of the cornea, iritis, synechiae, etc. Look for alopecia and thickening of the eyebrows, syphilides on the forehead and nasolabial fold. Examine the nose for sunken bridge, discharge, ulceration and perforation of the septum. Note any drooping of the corner of the mouth. Palpate the neck for lymph nodes.

Thorax and abdomen.—Run your fingers along the clavicle and feel for any thickening, swelling and tenderness. Palpate the ribs and sternum. Make the patient step away 3 or 4 feet from you and shift the position of the patient, so that the light falls *obliquely* on the chest and abdomen and flanks and you will be able to detect the earliest roseolar and macular syphilides or the old faint atrophic macular scars. Note the following points about the cutaneous syphilides:—Distribution, configuration, induration, itchiness.

Induration of a syphilitic eruption is a very characteristic distinguishing feature that a student of Syphilology should be trained to detect even with eyes shut. This induration is sub-epidermal and gives to the examining finger, a feeling as if the eruption is *in* and not on the skin.

In the female, the breasts should be examined, for scars, sores, and mucous patches. The umbilicus is occasionally a favourite site for moist papules.

The Back and Lower Extremities.—Turn the patient with his back towards you. Inspect the nape of the neck for annular recurrent syphilides. Palpate for enlarged glands. Test the spinal column for

mobility, pain, tenderness. Make the patient bend down and examine the buttocks, inter natal cleft and the anal region for any abnormality. The posterior aspect of the scrotum is conveniently examined in this position. It is a frequent and overlooked site for annular syphilides. Examine the lower extremities for scars, ulcers and tenderness. Test the joints for swelling and limitation of movement. Inspect and palpate the tibia for thickening tenderness and irregularities of contour. The soles of the feet and the interdigital clefts should be examined for syphilides, keratosis and perforating ulcers.

Mucous Membranes.—Proper illumination either good day light or an artificial source such as an electric light is necessary for the examination. Inspect the outer aspect of the lips, with the mouth shut, for thickening, asymmetry, drooping, fissures, etc. The inside of the lips, gums and cheek should be inspected for evidence of erosions, mucous patches and leucoplakia. Examine the sides and dorsum of the tongue for thickening, contracture, loss of papillæ, fissuring and mucous patches. The palate, fauces and pharynx should in turn be inspected for congestion, ulceration, perforation, scarring and deformity.

In all cases of generalised Syphilis, it is a good working rule to examine the pupillary reflex, the deep reflexes and the cardio-vascular system. In cases of Gonorrhoea, the urine should be examined by "the two or three glass tests," for evidence of turbidity and threads. It should form part of the routine to examine the Cowper's glands, prostate and seminal vesicles. The first and the last are not palpable normally and the second is invariably infected in the majority of cases.

The physical examination herein described looks long and tedious on paper but in practice, does not take more than 5 to 7 minutes to go through. Failure to carry out this systematic and minute examination will sometimes result in annoying mistakes of diagnosis.

Cardiac Tonics

By Dr. V. ISWARIAH, B.A., M.B., B.S.,

Department of Pharmacology, School of Tropical Medicine, Calcutta.

The recourse to one of the so-called cardiac stimulants in any case of emergency threatening death is such a common observation that there is fear of rational treatment degenerating to empiricism in the hands of some of the medical men. Indiscriminate use of the so-called cardiac stimulants only results in the wastage of camphor-in-oil in the case of one physician, destruction to the ampoules of adrenalin and pituitrin with another, or precious wastage of strichnine, digitalin tabloids with a third.

The vague inclusion of a number of drugs under the heading cardiac stimulants is what is often observed with the consequent indiscreet use of them. The mistake often arises from the fact that the heart is counted the only important factor in the maintenance of efficient circulation. In any case of threatened death the poor heart is incriminated and whipped to function by the so-called stimulants of the heart which is not very different from replenishing a car with extra petrol to make it move when the four wheel breaks are engaged. One is far from suggesting that it is ever easy or even in present state of knowledge is always possible to determine the primary cause of circulatory failure in a particular condition but it is undeniably the ideal to be aimed at.

Elementary physiology tells us that a number of factors are to be reckoned in a case of circulatory failure as the tone of the arteries, arterioles and capillaries, the viscosity and coagulability of the blood, the total quantity of blood, and, last but in no way the least important, the centres in the medulla that maintain a vigilant watch over the various component parts of the circulatory system. Hence in the application of each of the so-called cardiac stimulants one has to know which link in the mechanism is weak. In a case of profound shock the heart proper is not damaged in any way directly and hence a stimulant to the musculature of the heart is not indicated. The central, cardiac and vascular paralysis are due to different causes, and, though circulatory failure is the result, in the end the line of treatment to arrest the

catostrophe is dependent on the factor or those factors which initiate the breakdown of the circulatory mechanism. Of course, they react on one another and at a later stage it is indistinguishable which factor was responsible primarily. Peripheral stagnation due to vasomotor paralysis causes less blood flow into the heart and therefore less into the coronary vessels which damages the musculature of the heart and the myocardium is enfeebled. There is therefore often a confusion in the use of the term heart failure. This indistinctness in the use of the term cardiac failure has led to a promiscuous mixing up of a number of drugs; undoubtedly acting on some link in the chain of the cardiac cycle—all under the heading cardiac stimulants or cardiac tonics.

Professor Gunn has very aptly pointed out that it is impossible to coerce substances that are bound to be dissimilar in action into a common group and it is obvious that from the therapeutic side there are all the elements necessary for confusion until we have a more accurate classification and a lucid idea of the term cardiac stimulants and cardiac failure. It would therefore be not without profit to consider some of those conditions of "heart failure." Failure of the function of the circulatory system may be due to causes suddenly acting or those acting gradually. Examples of acute heart failure are, death of the heart due to starvation and insufficient supply of healthy blood. The heart being a sensitive vital organ withholding nutriment for even a very short time may permanently stop its function. A case of hæmorrhage internal or external causes acute failure of the heart. The vital centres in the main are rendered anæmic and extinction of life is inevitable but the heart is capable of functioning independent of the brain for a long time if the necessary conditions for its independent life are maintained. An isolated heart works in a glass chamber for hours if it is perfused under ideal conditions as temperature, oxygen, constituents of the perfusing fluid, etc. Hence, heart failure in a case where the higher centres are, or not functioning, may be due to inadequate supply of nutriment to the heart. In a case of hæmorrhage therefore, the line of treatment is to supply the deficiency in the nutriment, *i.e.*, by saline or other suitable infusions. No drug injection is of any avail in such a case.

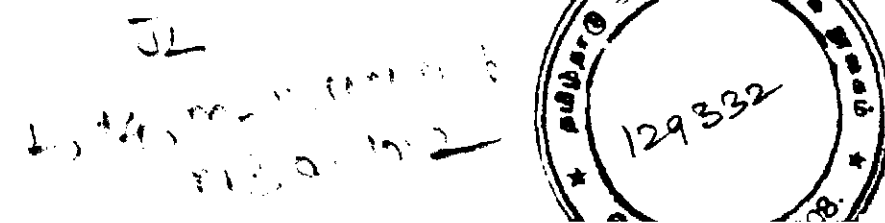
2. *Another acute condition to cause failure of heart is shock.*—Whatever be the actiology of shock the pathology is alleged to be stagnation of blood in the capillaries and arterioles due to loss of tone of

Cardiac Tonics

the blood vessels. This brings on the same effect as hæmorrhage, *i.e.*, deficient supply of nutrition to the heart. Hence the condition is rightly called a case of bleeding into one's own capillaries. Here the total volume of blood in the system remains unchanged and yet the heart is not getting sufficient blood. Theoretically the line of treatment in this condition is to give a sympathomimetic drug to construct the peripheral vessels and drive the blood to the heart. Stimulant to the heart muscle at this stage resembles an attempt to drive fast a thirsty animal, drawing a vehicle at noon day, in the tropics.

3. *There is another cause of acute failure of a heart which was otherwise quite healthy.*—When experimenting on animals with the chest open one often has observed sudden rise in the blood pressure followed by a fall indicated by the monometer. A normal heart suddenly begins to dilate and the blood turns livid. What is happening?—the lungs are not properly expanding, the tube connecting the artificial respiration pump to the trachea is kinked or some one is stamping the connection tube. The result is that the lungs are not expanding, the blood is not properly oxygenated the heart is not receiving the proper quality of blood. The heart muscle loses its tone and begins to dilate, and finally, the heart stops in a condition of diastole. This condition one meets with in a case of drowning or asphyxia by an inert gas, or in a case of heavy consolidation in lobar pneumonia. In a case of pneumonia it is said that death is often due to the toxin of the micro-organism acting on the myocardium adversely, but deficient aeration also acts as a toxin in most cases of pneumonia and before cyanosis appears the heart may be acted on as a result of under ventilation of the lungs. In a case such as this no drug of any potency is indicated but only oxygen to restore the heart.

4. Cardiac failure often occurs early in CHCl_3 administration from ventricular fibrillation due to the anæsthetic being given in too high a concentration. Cardiac failure also occurs late in the administration of CHCl_3 from paralysis of cardiac muscle with respiratory and vasomotor paresis. There are other symptoms of CHCl_3 poisoning as fatty degeneration of heart or liver which we don't take in at present. In the first type of failure, adrenalin if it could reach the heart, might do more harm than good. The treatment then would be to stop the anæsthetic and try to dilute its concentration by administering oxygen or sometimes even CO_2 . In the second type of cardiac failure adrenalin may save life by acting as a peripheral vasoconstrictor and sending



more blood to the heart by taking up the function of the lost vasomotor centre.

Cardiac failure therefore due to one poison may be aggravated or relieved by the same cardiac stimulant. There is no quibble in argument or jugglery in physiology or adaptation of pharmacology in an attempt to understand the rational application of a drug.

It baffles one then how a number of drugs came to be included under the designation of cardiac tonics for treating conditions whose pathology is so varied and indistinct as the above. Camphor, alcohol, musk, strychnine, caffeine, digitales, pituitrin, adrenalin are some of the ones vaguely used. There is no similar agreement as to the influence on the circulation of any of the above. Not only is there among pharmacologists disagreement as to their mode of action but there is the utmost diversity of opinion amongst clinicians about their therapeutic value. The mistake often lies with the confusing of stimulants of other vital functions with the cardiac stimulant. As pulse is the rough indication of the life of an individual, anything which improves the pulse is counted as a cardiac or circulatory stimulant when pharmacologically the drug has no action whatsoever on the circulatory system. The idea conveyed by a heart stimulant is that a drug by its direct action on the heart muscle improves its condition and thereby its function. Here one should clearly grasp the idea that nothing is directly capable of improving the condition of the heart to function efficiently as pure healthy blood. Blood, containing toxins—bacterial or chemical—naturally renders the myocardium unhealthy; and no drug could undo the harm of the toxin. The preliminary line of treatment in such a case is to get rid of the toxin when the heart muscle returns to normal if not badly damaged. Some of the recent experiments tend to indicate, that the injury that results to a heart in organic heart disease, is the result of over stretching of muscle. It is often this, which is the direct cause of the hypertrophy, and a hypertrophic heart undergoes degeneration earlier than a normal heart. The rationale of treatment in such a case, is to avoid further injury to the muscle, which is possible by lowering the venous pressure under these circumstances, which just postpones the date of degeneration of the muscle leading to fatal decomposition. A fibroid or degenerated muscle fibre, could never be restored to its normal condition by any drug, but the heart that has been affected by the toxin could be made to work efficiently for normal well being by changing the condition under which it has to function, *i. e.*, (a) by reducing the peripheral

resistance, (b) by altering its viscosity or other biochemical feature of the blood, and (c) by giving the heart more rest by altering its beat. It is in connection with the last of these that a number of drugs are claimed to be cardiac stimulants to "stimulate" the heart for efficient functioning by ensuring enough rest by prolonging the diastole.

When therefore the term cardiac stimulant is used, it may mean at least three things. It might be used to denote a drug, which in any way directly or indirectly increases the output of the heart, irrespective of how it acted and for what condition it could be used. Secondly, it might be limited to drugs which increase the minute output, by some action on the heart or its nerve supply. This would exclude vascular effects which secondarily improve the heart beat, but would still include drugs like adrenalin, atropine, ammonia, etc., which act differently and the therapeutic application of which are not interchangeable. Lastly, there is a strictly limited definition as stated for example by Wiggers, "a cardiac drug will be regarded as a true stimulant, if it produces an increased ventricular pressure maximum by a primary effect on the heart operating, under the constant dynamic condition." If the term cardiac stimulation is to be retained at all, it would seem necessary to restrict it to the last definition. If one should have descriptive terms, clumsy though they may be, one must call strychnine a central medullary stimulant, strong alcohol a reflex medullary stimulant, pituitary a peripheral vascular stimulant and adrenalin a vasomotor stimulant.

The rationale of the application of some of the alleged cardiac stimulants may now be considered. Pharmacologically the one that acts mainly on the heart or the neuromuscular system is the digitalis group. To a less extent, the drugs that have fairly certain action on the circulatory system other than digitalis, are strychnine and caffeine with its derivative theophyllin. The ones that are of doubtful utility are alcohol, camphor, musk, etc. In the treatment of chronic heart lesions administration of such or the drugs that claim to have specific action on the heart alone are of no avail. In the condition of heart disease with oedema, drugs that have no direct action on the heart are also to be used in combination with the admitted heart drugs as calcium chloride or acid salts or a number of organic compounds of mercury. In the case of auricular fibrillation quinine is the one drug of value with or without other reputed heart drugs.

Alcohol.—Although ethyl alcohol is generally discussed with other alcohols it is in a sense really not a drug but may be classified physiologi-

cally as a normal produce of metabolism and to a certain extent as food. In a very recreative and hope inspiring article prepared in relation to the alcohol problem in the United States, Professor David, I. Macht, surveyed the scriptural references to alcohol. He compared the various allusions in the Holy Bible to the action of alcohol with the observations on experiments and came to the conclusion that a pharmacological appreciation of Biblical allusion to alcohol leads us to but a single logical conclusion *i. e.*, that the book of books is in complete accord with the most modern and advanced experimental data on the subject! The action of alcohol is dependant on a number of factors and even if these factors are constant the action is sometimes not. The action of alcohol on the circulation is then partly dependant on (1) the dose, (2) the concentration, (3) the mode of administration and sometimes (4) the state of the individual. The literature that deals with the arguments for and against alcohol is vast. The difference in view is partly due to the neglect of consideration of one or more of the above factors. Concentrated alcohol in the form of whisky or brandy in small amounts has been given for fainting fits in healthy people. The effect comes on too soon to be due to the action of absorbed alcohol and is too independent of the quantity; being dependent mainly on the concentration for it to be other than a reflex action. Seeing that irritation of the mouth and upper part of the alimentary canal among other forms of peripheral irritation is known to stimulate reflexly the medullary centre it would seem difficult for alcohol in an irritant concentration to avoid exercising this effect. Isolated heart in concentration of 1-10000 is not affected by alcohol. In an intact animal B. P. shows a slight immediate rise followed by a fall. The rise is most probably due to reflex action as it is too early to be the action after absorption. For reflex action the centre has to be functioning. If the central nervous system be depressed not from momentary defective circulation but from prolonged defective blood supply or from toxic action, the medullary centres may be long past stimulation by such reflex irritation, for, physiological experiments show that in gradual paralysis of the vasomotor centre it is the effect of reflex stimulation that disappears first. But alcohol finds its use in chronic illness as well where the reflex action is not likely to be of benefit. Hence it must be due to action after absorption. Alcohol for this purpose is not administered in concentrated form. It is difficult to trace the exact pharmacological action in such a case. The one constant feature of alcohol which the most inflexible temperance advocate cannot deny is the flushing of the

face and probably the body after a fairly heavy dose of alcohol. It is not possible here to consider its general action on the nervous system, its alleged antipyretic action or its food value though the indirect results of such action on the circulation may be far from negligible. Most pharmacologists hold that alcohol after absorption has no definite action on the heart direct. The flushing of the face noticed is obviously due to dilatation of skin vessels and since there is no appreciable change in the B. P. there should be a constriction in some other part most probably the splanchnic. All the benefits of alcohol administration should be explained by these observations alone. As to when if ever such a redistribution of blood is to benefit the patient generally or favourably influence the heart it is difficult to say but it does not leave things as they were and must alter them for better or for worse. Fainting due to coldness of skin is then about the ideal condition indicating the use of alcohol for its action after absorption. The utility of alcohol in cases of infection where the heart is damaged by toxins is doubtful.

Camphor.—If there is disagreement about the action of alcohol there is hardly less dispute about the effect of camphor and it is difficult to reach any satisfactory conclusion from the extensive and contradictory literature on the subject. Most pharmacologists agree that the therapeutic application of camphor is not warranted by experimental findings. But there are many even to-day who regard camphor as a cardiac stimulant, the one drug to be given first in emergencies, the most reliable and speedy in its action under most circumstances and the one to be exhibited with confidence after all the other drugs have failed. Marvin and Soifer on the observation clinically of over 600 cases in New Haven assert "experimental and clinical evidence in support of this alleged confidence however leaves one puzzled to understand whence this drug gained its reputation". Subcutaneous injection of camphor due to its irritant action has reflex effect on the heart, an action somewhat resembling concentrated alcohol. One would expect its action to be more prolonged than that of alcohol because camphor dissolved in oil will exert a more prolonged irritant action than alcohol which soon gets diluted and fails to maintain the irritant action. But more has been claimed for camphor in that it stimulates the heart after absorption. Failing to prove that camphor acts on a normal heart it has been claimed that it improves the heart in a depressed condition in an irregular heart. The evidence that camphor has a dilating effect on the vessels especially the coronary and skin vessels is a little more convincing. On the basis of

our experimental findings with a series of six camphor compounds differing in optical activity and certain physical properties we are in a position to say that camphor has no stimulant action on the normal heart, but slightly improves the condition of a heart damaged previously. Sullman feels that no conclusion could be drawn from the experimental work on animals. He states that the experimental effect of camphor on the circulation are inconstant and inconsistent—different investigation reporting divergent results and concludes generally that there is no definite response if the circulation is normal. As previously mentioned from the clinical standpoint as well there appears to be considerable disagreement regarding the therapeutic value of camphor. As with alcohol the beneficent action should be due only to the redistribution of blood and the difference in the results claimed for them may be due to want of knowledge as to when such an alteration in the blood distribution will benefit the patient generally on the heart function in particular. In cases of cardiac failure with general anæmia it may slightly relieve the condition by acting on the sweat centre directly acting on the sweat glands and increasing secretion.

Musk.—The use of musk as a cardiac stimulant is not supported by evidence drawn from laboratory experiments. The Indian *Materia Medica* by Ghosh and Katrop claims for musk a variety of properties such as antispasmodic, aphrodisiac, in addition to its stimulant effect on the heart. Clinically it appears to be a diffusible stimulant affecting the heart sometimes advantageously. In a paper read by Dr. David etc., at the last Science Congress held at Madras the authors claimed for musk a pronounced leucocytic effect in cases of leucopaenia and as such capable of raising tissue resistance and thereby perhaps indicating the circulatory system.

It is a relief to pass from these uncertain and alleged cardiac stimulants to the terra firma of strychnine, digitalis, caffeine and adrenalin group.

Strychnin.—The primary action of strychnin is on the anterior cornual motor cells of the cord. In certain circumstances it increases the excitability of the vital centres situated in the medulla at a site that corresponds to the anterior cornual cells lower down. Though Professor Dixon believes that strychnin strengthens the beat of the heart by directly acting on the cardiac muscle the main evidence is against this view. The effects of stimulation of the vasomotor centre are well known. The arterioles of the splanchnic contract while the vessels of the heart,

lungs, C. N. S. and skin which are feebly if ever supplied with vasoconstrictors dilate. The general effect is to raise the aortic pressure and to drive more blood through those organs which are more immediately concerned with life. Professor Gunn suggests one or two conditions preliminary to its application. (1) The primary failure should be vascular and not cardiac, here precision in diagnosis is important, (2) the state of excitability of the nerves and centres are of great consequence. If the vasomotor centre is depressed by the action of toxin or prolonged impairment of blood supply strychnine may have little or no effect. There is then the question of dosage. Whither in his text book on *Materia Medica* stresses the point that strychnine hypodermically in dosage less than $\frac{1}{10}$ th. gr. is of no avail. Even this in deep depression of the centre or on cases of peripheral paralysis of the vessels will fail to act. If we were in a position to determine more exactly the nature and degree of vascular paralysis it is probable that the sphere of utility of strychnine would be more narrowly limited and the present divergence of opinions as to its value would largely disappear.

Often atropine is combined with strychnine with the idea that strychnine stimulates the vasomotor centre and atropine is required to stimulate the respiratory centre. The vital centres are situated at very close proximity to one another and though one would expect the drug to act on all the centres together, in practice we see that there is a selective action of the drug on these centres and hence a drug may act on one pharmacologically and not necessarily on the other. But that apart strychnine stimulates the respiratory centre as well as the vasomotor centre.

Caffeine.—Though certain and definite pharmacological results have been arrived on animal experiments with caffeine it is strange that caffeine is not being much used therapeutically. A strong black cup of coffee is sometimes administered by mouth or per rectum when a general stimulant effect is desired. Caffeine in animals tend to stimulate the vasomotor centre in the medulla and this would raise the B. P. were it not for a simultaneous widening of the vessels through a direct action on the walls (Cushney). But this finding is not responsible for its advocacy in therapeutics. Its reputation as a cardiac stimulant may probably arise from its efficiency in removing dropsy in heart disease. But this is the result of its renal action and the heart is not affected directly. In some cases the vasomotor action of caffeine has been most pronounced on the coronary vessels and this has sometimes given an action like stimulation of cardiac muscle. The vasomotor action of caffeine is uncertain being dependent

on factors like the sensitivity of the centre but it is alleged to have a more certain action on the respiratory centre and on the cerebrum. Hence the importance of the use of caffeine in all cases where the disturbance of circulation is due to a depression of all the functions of the central nervous system. But whether it directly stimulates the brain cells or effects it through blood supply is in doubt. The effect of caffeine on the feeling of weariness after heavy dinner may be due to its effect of displacing blood from the vessels of the intestines and is suited to overcome the cerebral anæmia which accompanies a hyperæmia of the gastro intestinal tract.

Digitalis.—The value of digitalis clinically led the earlier medical men to use digitalis for conditions like chorea, epilepsy, general paralysis, etc., but in 1775 Withering showed that it had a diuretic action and an action on the heart. After 1860 digitalis was definitely considered a cardiac tonic capable of raising the blood pressure. Yet some of the details of its action are not completely worked out. Three main actions of digitalis are admitted, (1) diminished conductivity from auricle to ventricle, (2) increased force of ventricular contraction and (3) stimulation of the vagal centre. The diminished rate of heart beat due to the first and third actions makes the heart expend its energy in the second action. As pointed out already no drug could act as a tonic or supply nutriment to the heart to enable the heart to function better but a drug by giving rest to the heart could help the heart to perform a sustained function. As a hypnotic in a fevered condition digitalis as Lewis has said is a cardiac hypnotic, for the benefit is due to the depressing rather than the stimulating action. If in a normal heart these actions could be utilised for the well being of the entire system in a damaged heart digitalis has a definite function. Mackenzie has showed that it produced a rapid beneficial action in cases of auricular fibrillation. Reversely in a condition of heart block digitalis is contra indicated. Then what are the other indications for its use. The enthusiast says that digitalis is to the heart what quinine is in malaria. Dr. Eggloston at the celebration of the anniversary of the opening of the General Hospital, Birmingham, concludes that digitalis is indicated in all cases of heart failure—that is where insufficient functioning of the heart is the course of the pathological condition. This holds good irrespective of the cause of the heart failure itself. Professor Wenkeback of the University of Vienna concluded an address to the British Medical Association some years back with the following words, "give digitalis a fair trial in every case and if ever I

should acquire a reputation for treating heart patients with success it will be from giving digitalis in cases where authorities and text books forbid it." The other school restricts the use of digitalis only to cases of rapid heart brought about by causes acting gradually. But in a sense digitalis is a sure cardiac stimulant as it increases the force of systole of the ventricle. If the venous circulation is normal this action is bound to do good first by increasing the coronary flow and next by increased output and raising the aortic blood pressure. But unfortunately one can't dogmatise on the action of digitalis for in individuals any of the three main action of digitalis may be emphasised. When digitalis is administered for increasing cardiac output by increasing the force of the systole the main action in that case may be slowing of the heart due to action on the vagal centre or by prolonging the a-v impulse. In cases where this effect is not desired there is atropine to neutralise it.

It may be mentioned here that the combination of digitalis with quinine seems to have been a very old one. Quinine seems to have had once a reputation as a heart drug little short of digitalis.

The action and use of adrenalin and pituitrin are fairly clear.

Ephedrine.—Ephedrine came into use only recently and though its pharmacological action is connected with the heart, its main use is for respiratory disorders. Ephedrine bears a close resemblance to adrenalin from which it differs in being active even when administered orally. Ephedrine stimulates the sympathetic nerve endings and ganglia. The pressor effect of ephedrine is fairly high. In addition, pseudo-ephedrine, the isomer of ephedrine stimulates the myocardium and increases the tone of the vessels by direct stimulations of the muscles of the blood vessels. Ephedrine is gradually finding its way into therapeutics and is being used mostly in asthma. The crude extract of ephedra was first tried as a cardiac stimulant by Lt.-Col. R. N. Chopra in the Carmichael Hospital for Tropical Diseases, Calcutta, with encouraging results. There was invariably a sustained rise in blood pressure after 60 minim doses of the extract t.d.s. for a few days. Later it was tried in cases of epidemic dropsy with encouraging results as well. Tr. ephedra m 10—15 t. d. s. were given with marked diuretic effect and relief to the oedematous condition. Still lately a tabloid form of ephedrine has been prepared by the Bengal Chemical and Pharmaceutical Works Ltd. 4—8 grs. of the hydrochloride, each containing about $\frac{1}{2}$ gr. of the alkaloid but this has not so far been used for cardiac condition.

Epithelial Odontomes

BY DR. N. S. NARASIMHAN, F.R.C.S.,

General Hospital, Madras.

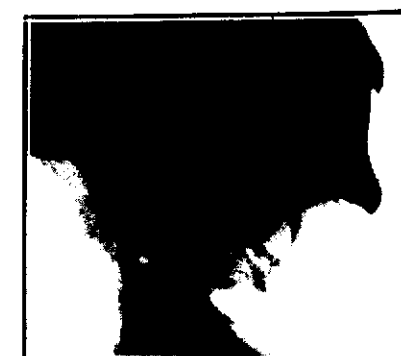
S., a lady of 25 years was admitted on 24.10.'29 into S-1. wards for a large swelling of the lower jaw, on the left side. It was of 4 years' duration. There was a sinus over the swelling. Some of the teeth were loose and displaced slightly inside. The last molar tooth was missing. An X-ray examination showed a cystic expansion of the bone and an unerupted tooth. I operated on the case and removed the outer and inferior expansions of the bone. The encapsulated cyst was well opened. It was composed of several cysts, separated from each other by bony septa, some of the cysts being in communication with each other. The cysts had a smooth lining, the fluid was thin and brown in colour. The lymphatic glands were not affected and the general health was very good. Convalescence was uneventful. (X-ray prints Nos. 1 and 2).

The pathological report was "Dentigerous Cyst." This was a case of multiple Dentigerous Cyst.

An odontome is a tumour derived from the special cells concerned in the development, of the teeth.

An odontome is a tumour because (1) it is a mass of new formation which tends to grow or at least to persist, (2) it fulfils no physiological function, (3) it has no typical formation.

Epithelial Odontomes formerly included only multilocular cysts but dentigerous cysts and dental cysts are added now because they have a similar origin. The multilocular cyst, as its name suggests forms numerous cystic cavities. The following names have been used in connection with this tumour: epithelial odontome, fibrocystic tumour of the jaw, cystic adenoma, proliferating follicular cystoma, cystic epithelioma and cystic sarcoma. From Madras Tirumurthi published a case in British Dental Journal, November 15th, 1913, with histological appearances of a case of multilocular cyst of 10 years' duration in a woman. Most authorities consider it as arising from epithelium. It appears invariably in the middle-aged, but this is against the above view. Some consider it as endothelioma (Bland Sutton) and others as an epithelioma. Histologically it is a hyperplasia of the down growths of surface epithelium which



Lateral View.

Multilocular cystic expansion of the lower jaw.

continues to grow and ramify in the substance of the jaw forming cysts and never giving rise to enamel. The fluid, in the cysts consist of serum albumin, serum globulin, water and cholesterin crystals and are produced by the constant breaking down of the epithelium on the internal surface of the cyst wall.

The second case was that of a woman aged 20 with a swelling of the right side of the lower jaw with an unerupted tooth but further investigation was impossible since she refused treatment. A Mahomedan gentleman was admitted on 10-6-'29, for a hard swelling of the size of a lime in the left cheek. The left nostril was obstructed, and the swelling was projecting into the mouth and in front of the teeth. There was no pain or tenderness or egg-shell crackling or bony involvement. A fortnight after a superficial course of radium therapy, excision of the maxilla was done. (Col. Croly's case). The patient got well. The pathological report was "Odontome".

There was another case of a railway servant aged about 35, with a fibrocystic disease of the lower jaw. The patient refused treatment. The last two cases were met during the course of a year and a half. There was one case of malignant epithelial odontome of the lower jaw in a man aged 60. From its clinical characters it was thought to be malignant. The whole growth was diathermised and a sequestrum separated itself in 8 weeks and the man is doing well. It is noteworthy in this connection that the late Sir Frederick Eve was completely convinced and described a number of odontomes as possessing malignant characteristics as two groups (*a*) columnar celled carcinoma and (*b*) fibrosarcoma.

Development of the tooth.—Teeth are developed partly from the epithelium covering the jaw, and partly from the mesoblast of the jaw. The epithelium forms the dental shelf by dipping into the future alveolar process. From the dental shelves are developed a series of cusps into which mesoblastic processes project as dental papillae. The deeper layer of the epithelium of these cusps gives rise to enamel organ. From the dental papillae are formed the pulp and dentine. Round the tooth germ is a sac of mesoblastic origin. Permanent teeth are laid down from the dental shelf as a series of buds. In the periodontal membrane epithelial remnants may be demonstrated anywhere from the apex to the neck of a tooth (Debris para dentaires of Malssez).

Classification.—Broca (1869) based his classification upon the degree of development of the tooth at the time when the abnormal development commenced.

Sir John Bland Sutton recognised the defects of this classification and substituted (1887) one which was based upon the particular cells of the tooth germ which had undergone aberration during the process of development. He included cystic formations and fibrous tumours of the jaws among odontomes.

The normal process in the development of a tooth is primarily dependent upon active changes in the epiblast cells. Secondary to this, and dependent upon it, changes occur in the subjacent mesoblastic tissue. These changes will affect both the dental papillae and the tooth follicle. The enamel organ has a double function, it produces enamel and it determines the external shape of the dentine, even in cases where no enamel is formed. In other words, the dentine is dependent upon the presence of an enamel organ. Therefore in odontomes where dentine is present, the aberration must have occurred primarily in the enamel organ.

This fact together with the discovery of an epithelial lining in certain cysts led to the modification of the classification laid down by Bland Sutton; the following is the one adopted by the British Dental Association:

1 *Epithelial odontomes*.—Here the abnormal development takes place in the dental epithelium alone.

- (a) Multilocular cysts.
- (b) Dentigerous cysts (tooth bearing cyst) Malssez (1885) correctly described the nature and origin of the cysts.
- (c) Dental cysts.
- (d) Malignant epithelial odontome. This has not yet been definitely established.

} Common

2. *Composite odontomes*.—Here the abnormal development takes place primarily in the dental epithelium, and, secondarily in the dental papilla, and may occur in the follicle also.

- (a) *Compound Composite, Complex Composite odontomes*.—The abnormal development of the dental epithelium results in the formation of numerous irregular dental papillae, which are calcified in one mass, or sporadically. The result is nothing like a tooth.
- (b) *Germinated Composite, Gestant Composite* (one within the other). Enamel nodules common:—The abnormal development of the dental epithelium is such that the

formation of two or more tooth like dental papillae results and are calcified as one mass. In the *Germinated composite odontome* two or more malformed teeth are fused together and is commonly met with in the incisor region. The *gestant odontome* is mostly found in the incisor region and erupts like an ordinary tooth but late.

- (c) *Dilated Composite odontomes*.—The abnormal development of the dental epithelium results in the formation of a dilated portion of the dental papillae which is calcified as one mass.

3. *Connective tissue odontomes*.—The tooth is normal. The abnormal development takes place in the dental tissues of mesoblastic origin only.

- (a) *Fibrous odontomes*.—It is exceedingly rare: all the reported cases are in animals and in persons who have had rickets.
- (b) *Cementomes*.—Met with now and then; enamel and dentine do not enter into it at all; it is more common in the horse than in man.

Multilocular cysts begin to form while the tooth involved is in its primitive state. Dentigerous cysts form during the period of eruption, and dental cysts form in connection with teeth which have erupted. Of these the dental cysts are very common but the rest are rare. The complex type, (b in A of 2) folded odontome, occurs mostly in the upper jaw and occasionally from the lower. It is usually small but may grow to the size of a tennis ball.

An important characteristic of composite odontomes is that the arrangement of the dental tissues presents an abnormal relationship with regard to the position of the structures. Dentine and enamel are irregularly distributed and cement is often entirely absent. The enamel usually presents an increase in quantity. The complex composite odontomes are those composite odontomes whose tissues are irregularly intermingled, and which have no definite shape. They consist of nodulated masses of dental tissues, varying in size from that of a small nodule, weighing a few grains, to a mass of 10 oz. or more.

Compound composite odontomes are tumours containing several separate calcified masses of dental tissue. The denticles vary in number may be as few as 3 or as many as 500 in one tumour. In size they vary from a mustard seed to a big nut. In shape they may resemble a supernumerary tooth or an irregular mass such as one finds amongst the

complex composite odontomes. Usually they are separate and enclosed in a sac but sometimes they are fused together by cement. They have been recorded in man and in some of the herbivora. They appear in youth and early adult life, and produce slow growing painless swellings.

Differential Diagnosis of Swellings about the Jaw.

- A. *In connection with the soft parts only, i.e., a cheek or gum—*
- (a) *Inside the mouth.*—Eupulis, myeloid eupulis—wherefrom the myeloid cells come we do not know.
 - (b) *Outside the mouth.*—Lipoma, fibroma, sebaceous cyst and affection of the lymph gland.
- B. *Swellings fixed to the jaw—*
- (a) *Externally attached to the jaw* and is known by a demarcation.
 - (1) General hypertrophy of the gums.
 - (2) Perisoteal fibroma, chondroma, osteoma (compact exostosis of the angle of the lower jaw and the upper jaw), and leontiasis ossea.
 - (b) *Inside the jaw.*—(The jaw is fusiform).
 - (1) Fluid (2) Solid.

1. Fluid Swellings—

- (i) Outer plate of the jaw is only involved unless very distended as in late stages. Fluctuation is present only in late stage. Bone is not distended but is absorbed by fluid swelling and deposition outside.
- (ii) Perfectly regular, except multiple cystic disease.
- (iii) The arch is perfectly regular, i.e., the line of teeth is regular.
- (iv) X-ray.

The following fluid swellings may be met with—

Acute or chronic abscess.
Dental cysts.
Dentigerous cysts.
Multiple cystic diseases (not perfectly regular but lobulated).
Mucous cysts of the antrum.

Acute abscess.—Bad tooth, necrosis of the jaw. Patient gives a short history of some days.

Chronic abscess.—History of duration of months: painful (Rarely actinomycosis—not reported in this country.)

Suppurating dental cyst.—X-ray: swelling got worse now but present for a long time.

Dental cyst.—Slow, chronic, six months at least or years. May find a septic tooth around which it starts definitely or tooth may have been removed without removing the cyst; any age, above 30; no sign of inflammation.

Dentigerous cyst.—Age, 15—20; History of three or four years; no sign of inflammation; X-ray; tooth inside, tooth missing from the arch, or it may grow from supernumary teeth.

Fibrocystic disease.—Cystic without epithelium. Pathology not known.

(2) Solid Swellings—

Both the plates are involved, as a rule the external more often than the inner.

Innocent and malignant.

Innocent.—Slow in growth, one year at least; tooth pushed. Palpation result depends on whether bone is present on it or not.

(i) *Commonest is solid odontomes.*—(Two or three years).

(ii) *Myeloma.*—May recur after removal.

(iii) *Osteitis fibrosa.*—Exception to the rule of distension of both tables. The external table is very much more distended. It is difficult to distinguish from multilocular cysts, except by X-ray by the wooly structure seen and the absence of cysts. The pathology of this is not known. (Fibrous tissue with osseous tissue).

(iv) *Myxoma* is rare.

(v) *Endosteal fibroma* is also rare.

(vi) *Endosteal Chondroma.*—The malignant solid growths are very rapid in their growth.

Editorial.

The Madras Medical College Association was "At Home" to the Medical Graduates of the year on the 23rd of August 1930. Our new Surgeon-General Major-General C. A. Sprawson, C.I.E., V.H.S., addressed the graduates on the occasion.

He spoke of the high and noble ideals and traditions that have been created round the profession by the great men of the past. He advised them to be selfless in the service of humanity and that they should consider themselves well-paid by the satisfaction of having cured or alleviated the sufferings of the patients and earned their gratitude. Remuneration should be of secondary consideration.

The young medical graduates present there had a hard up-hill struggle to look forward to, and could not now-a-days expect soft jobs. The need for selfless work among the ailing and ignorant population of this country was great. The young Doctor should find satisfaction in the service of science and humanity, and that was his duty.

There was vast scope for many young doctors in the field of medical research, which was still in its infancy in this country and where, so much has yet to be done, though it would mean hard and steady work. The young medical men in India should aspire more in this direction than the development of lucrative practice. The field of research was a difficult and laborious task but if something was achieved, the mere satisfaction of that would outweigh all the success of a general practice.

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Medical science is an advancing and expanding subject and its devotees have to keep themselves abreast to achieve any success.

We are sorry to learn of the departure on leave of Col. E. W. C. Bradfield, C.I.E., O.B.E., Professor of Surgery. There were a series of entertainments to prove his popularity amongst the staff and students.

We are glad to receive again amongst us that popular figure, Col. R. G. G. Croly, as the Professor of Surgery.

We are also glad to have again amongst us Dr. M. L. Kamath, who is posted as the Professor of Medical Jurisprudence.

Our hearty congratulations to our popular Editor Dr. T. Bhaskara Menon on the appointment to the Chair of Pathology in the Sister College at Vizagapatam in place of Dr. T. S. Tirumurthi, who has availed himself of leave.

We give a hearty welcome to Dr. P. Krishnaswami on his return from England after an arduous post-graduate study and our congratulations on his being appointed to the Chair of Medicine in the Sister College at Vizagapatam.

At the time of going to the Press we hear the tidings of great joy that our men have come back from the Annamalai University with the Intercollegiate Athletic shield. We offer our congratulations to the heroes.

Athletics.

We have great hopes this year in coming out with flying colours in all the various fields of sport. Our Secretary Ravi and Dr. Mangesha Rao are sparing no pains. We have excellent teams in hockey, football and cricket. We have every chance of carrying off all the cups and the shield in the Intercollegiate sports. At the time of writing this, our men are contesting in the Annamalai University Sports. We have sent a team consisting of D'Costa, the All-India Champion Long-jumper, Beetles, Denton the Putter, Ghani, Balan, and McInnis.

We welcome Mr. B. D'Costa the All-India Long jump Champion and Madras Presidency Hundred Yards Champion, who has joined our college this year. We expect much from him and trust he won't disappoint us:—

—I. D

HOCKEY.

We have one of the best teams we have ever had for many years. The following contests will stand testimony to this assertion.

Matches played :

College against Loyola twice (1) 4 : 1, (2) 1 : 1.

College vs. Presidency twice (1) 2 : 0, (2) 3 : 0.

College vs. Christian..... 7 : 1.

College vs. Pachappas 4 : 0.

The Team :

Letang

Denton

Gonsalves

Muller

Saldhana

Ghani

(Capt.)

D'Costa

Beetles

C. J. Pereira

D'Vaz

Gibson

—A. SALDHANA

Captain.

CRICKET.

We have a very strong team this year and expect to make good, and win back the Pennycwick Trophy.

The Contests :

1. College vs. R.M.S.—R.M.S. all out for 32 runs. College 120 runs for two wickets the score being put up by D'Costa and Wilkinson. The match ended in a win by nine wickets and 96 runs.

2. College vs. The Vets—The Vets 121 all out. Out of which 73 runs were scored by Mr. Hurly one of the staff. College put up 164 for four wickets, F. W. Pereira and Garson scoring 44 and 56 runs respectively.

4. College vs. The Engineers.—Engineers 61 runs all out. College 61 for four wickets.

The Team : D'Costa (wicket keeper), C. J. Pereira, Garson, Gonsalves, Wilkinson, Denton, Martinus Jr. (Capt.), C. T. Rangasamy, Chan Sahib, Martinus Sr, F. W. Pereira. Reserves : Morrison, Gibson, Saldhana, Kuruvila, Chellappa.

—FRED MARTINUS,

Captain.



Standing: McInnes and Balakrishnan,
Sitting: Ghani, Beetles, Ravi Varma (Secretary), D'Costa and Denton

FOOTBALL.

We have a better team than last year's; let us see what we can do. We have a valuable addition this year in the form of Panchapi Kesavan and extend a cordial invitation to him.

We played against the Vets in the Intercollegiate Tournament and won by four goals, the score being 5 : 1.

—BALAKRISHNAN,
Captain.

(Latest News).

ANNAMALAI UNIVERSITY INTERCOLLEGIATE SPORTS.

Our college had an overwhelming victory. We won the shield and the individual championship. Denton broke all his previous records in the shot-put. Last year's Intercollegiate record has been thus beaten. D'Costa displayed himself marvellously by winning four events and placing in two, thereby winning the championship. Balan won the Hurdles in great style. Beetles our College champion kept his flag flying by winning the 440 and placing in three events.

Ghani our stalwart veteran "Pulled together" with the rest to win the shield. McInnis the fresher is a promising star.

The Contests :

100 Yards.—1. D'Costa (Medical), 2. Beetles (Medical), 3. McInnis (Medical).
120 Yards Hurdles.—1. Balan (Medical), 2. Nilakantan (Engineering), 3. Annamalai.

Long Jump.—1. D'Costa (Medical), 2. Mani (Engineers), 3. Beetles (Medical).
High Jump.—1. Nilakantan (Engineers), 2. D'Costa (Medical), 3. Ghani (Medical).

Pole Vault.—1. D'Costa (Medical), 2 & 3. Annamalai.

Shot-put.—1. Denton 34' 4". (Medical), 2. Beetles (Medical), 3. D'Costa (Medical).

Hop-step and Jump.—1. D'Costa (Medical), 2 & 3. Annamalai.

440 Yards.—1. Beetles (Medical), 2. Annamalai 3. Engineering, 4. McInnis (Medical).

Relay.—(Ghani, Beetles, D'Costa, and McInnis) Medicals :—1st—Won by a distance. The last man walked in! 2. Annamalai, 3. Engineers.

Championship :—D'Costa (Medical).

Champion College :—Medicals.

1st Medicals	...	53 Points.
2nd Annamalai	...	23 ..
3rd Engineers	...	14 ..

D'Costa 1st.....	24	.. (Medical).	} Individual Points.
Beetles 2nd.....	12	.. (")	
Nilakantan 3rd.....	8	.. (Engineers)	

RAVEEVARMA,
Sports Secretary.

Students' Forum

GIFFARD SCHOOL,

9th October 1930.

DEAR READERS,

At the outset I must apologise for this delay in "releasing" the second issue of our magazine. It is not altogether our fault. We have to, in thanking the contributors, also add that we shall be more grateful if they in the future would kindly let us have their materials in time without making me go to them at least a score of time before they hand over their manuscripts. We wish to thank specially this time those of them who have given articles with case reports and X-ray prints which entailed them a substantial amount of time and labour. In the midst of their busy time the time allowed for our sake is greatly appreciated.

It is always worth waiting for a worthy thing. This issue contains very valuable articles of special interest to students and we have spared no pains to get them and we hope they will be read diligently. I would like to mention here that "Cancer of the Cervix Uterus" by one of our college mates is quite "inspiring" and we offer our congratulations.

It is a sorrowful fact that we get very little contributions from the pen of our students. They have a notion that it is their "Masters," job to "feed" them through the magazine. Here is an extract from the letter of Lt.-Col. King, Director, Guindy King Institute, who in replying to my request for an article writes:

"I suggest that you do not go in for more than *one* learned article from teachers or similar contributors and that you make your magazine a *more general* one with articles from *students* themselves on sports, life in their own homes and hostels, literature, fiction, humour, college life and class activities. If you don't mind friendly criticism I would say that the last number is too learned altogether for a *college* magazine." I entirely agree with all this, and hope that students will give us such *wholesome* stuff for our magazine. My efforts during the last few months to get such contributions and case reports from students have not altogether failed. We earnestly hope that the students will respond more cordially and liberally to this appeal in the future. We want quite a number of case reports to be submitted by students. There are quite a

Students' Forum

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number of Physicians and Surgeons in our hospitals to render them all help in this. Case Reports do not mean only some unearthly and out of the way cases! Letters from students for the "Students' Forum" are invited.

The memory of our College Day and Reception to the graduates is fading away but there are factors which stand in clear relief in front of the dim background of events. The notable fact this year was that a number of students put their heads and personal efforts to make the function a success. It wasn't a one man's (General Secy's) affair. Though it was purely run by students, some members of the staff made themselves one with us in our work. We are unable to express our thanks adequately to Lieut.-Col. Pandalai and Dr. Mangesha Rao. They sweated for us in trying to perfect every detail.

The Tamil drama was a splendid success and we greatly appreciate the efforts of those who took part in it. We greatly admired and enjoyed the acting of the Ladies (especially that of Miss Higgins) in the English farce. They have a great future not only in the *operation* theatre or at the bedside but also on the stage! We hope more of our Ladies will come forward like this; but it is upto us to offer all encouragements. We thank heartily the "Veena Experts".

We bid good-bye to Lt.-Col. Bradfield. We are missing him very much in the G. H.; especially we miss his clinics and his 'raggings'! We take the opportunity to welcome Lt.-Col. Croly whose return we always look forward to, and welcome him with joy.

We congratulate Major Hesterlow on his appointment to the place of Director of Public Health; and Dr. Bhaskaramenon, our Editor, on his becoming the Professor of Pathology at Vizagapatam. We could ill spare him and we miss him greatly.

We have just heard the glad news that our athletic stars who went to Annamalai University to compete for the Intervarsity Sports have come back with the shield which costs about a thousand rupees. Further details of the contest will be found elsewhere in this number.

We are glad to receive for this number the 2nd article on "Sprue."

I must once more ask all the class representatives, other office-bearers of our Association, Sports Secretary, U. T. C. Officers, and all others to send liberal contributions for the Magazine. The next number is expected to come out during the first week of January and all contributions must be sent in before the 10th of December.

Before closing, let me again say "Sorry" for this delay in issuing this number. I have had to go through quite a bulky amount of manus-

Doctor.—Nothing doing! Not a blessed opening anywhere. I've been going the round ever since I got back. My London and Edinburgh laurels are not appreciated. I came back with great hopes with all the world in front of me to receive me with a mighty applause. But now it doesn't seem as though they want my services anywhere. What price London!

Student.—Oh cheer up! Things aren't as bad as you make them out surely. It's all a matter of waiting. With your qualifications.--

Doctor.—Qualifications be hanged! I am sick of my qualifications. I wish I had never gone to England.

Student.—Nonsense! Don't talk rubbish!

Doctor.—"It isn't nonsense, it isn't rubbish. You have no idea how miserable and anxious I am—, going practically from door to door for recommendations. This is India! My capacities and qualifications are not recognized because I haven't a "Father-in-law". Do you see that steamer on the horizon? (peering disconsolately into the gathering gloom) They have just lit the lights on board. How beautiful! I wish I were in it going back to England where my value is recognized. Life here is just awful, awful.....Take the girls, (He added a moment later as though to illustrate his point!) Take the girls here; the moment you look at them they behave as though they haven't got any clothes on.....God, what a life!

Student.—And what about the girls elsewhere? What about *their* clothes? Do you call *that* modesty?

Doctor.—I don't know what you mean by modesty. Do clothes make modesty?

Student.—Don't they?

Doctor.—I don't feel like an epigram at the moment, but you inspire me to one. The girls out West mayn't have much on, in the way of clothes, but they behave as though they don't know it. And that it seems to me is the essential difference between them and their sisters out here. They are more free, more friendly, more human.

[Here the most interesting conversation stopped. Both the friends were getting excited. The conversation took this unexpected but not uninteresting turn; I had my own views on the matter; I didn't want to add fuel to the fire in the hearts of either; the shades of night were falling fast; the sky was threatening rain; I had no light on my cycle, as usual, and I took myself off reluctantly from my interesting friends and the marvelous deep purple sea.]

Doctor in Baby ward.—Is there anything for me to note Nurse?

Nurse.—Kid napping Sir,

Doctor.—(Startled) What! What do you mean?

Nurse.—You remember the child that bothered you and screamed so much the whole of yesterday, that kid is napping sir.

Doctor.—What special treatment do you give for a case of influenza complicated with pneumonia?

Student.—Mist influenza, continuous oxygen inhalation, and turpentine soup thrice daily.

At the operative surgery class.

Professor.—What is the commonest and important indication for excision of the maxilla?

Johnny Walker.—Ankylosis sir.

"Mummy, I've got stomach ache," said six years old Nellie.

"That's because your stomach is empty; you have been without your lunch. You'd feel better if you had something in it."

That afternoon the minister called, and in conversation complained of a severe headache.

"That's because it's empty," said Nellie. "You'd feel better if you had something in it."

Overheard at the Maternity hospital, a Sister lecturing to a raw nurse:—

"When you have given the baby it's bottle; you should screw its head off and put it in boiling water."

Rayan was surprised to find Fred Mart emptying the contents of an oil can into the petrol tank of his newly bought "Road Engine." "What on earth are you doing?" asked Rayan.

"Why," Mr. Mart replied, "Do you know, this machine of mine will run only thirty miles on a gallon of petrol while it is said in the book of information, I bought at the second hand stall at the Moor, that she will do about 800 on a gallon of oil?"

Registrar.—Well, are you ready to have the knot tied?

Bridegroom.—Yes, make them one of them, ere, a slip-knot.

"If I were to kiss you," he said as he edged nearer to the beautiful girl, "would you call your father and mother?"

"Not unless you are keen on kissing the whole family."

Bashful Lover.—(Nervously) if I kiss you, will you scream?

Impatient Girl.—If you don't do it at once I will scream.

The elderly lady, riding for the first time in a taxi, was much annoyed at the driver's habit of constantly putting out his hand. At last she could stand it no longer. "You attend to what you're doing," she said, "I'll tell you when it's raining."

The lady.—"My, Your little brother is growing! How old is he?"

Little girl.—Yes, Mam; he comes up to the hem of mamma's skirt now. He is ten years old now.

Bride.—Darling, which of the dishes I give you is your favourite?

Zach the newly-wed.—Oh—er—I think you cook the tinned salmon best, love.

Doctor.—You must give your husband plenty of cereals.

Patient's wife.—Yes Doctor, but we can't afford to subscribe for more than one magazine, so he will have to walk all the way to the Reading Room if he should have plenty of serials.

Policeman (stopping motorist): Stop!

A. K. Raman.—What's the matter?

Police.—You were doing sixty miles an hour.

A. K. Ram (eagerly):—Will you write that down and sign it? I am trying to sell this car!

T. S. T.: "Have you ever been in a railway accident?"

T. C. T.: "By jove, rather! I remember one day when I went through a tunnel on the way to Trivandram and kissed the father instead of the daughter."

Doctor in charge of the ward.—What is the prognosis of this case?

Student.—Bad.

Doctor.—Why do you say that?

Student.—Because you are treating it sir.

At the operative surgery class.

"I say, don't quarrel. You do the appendectomy on this side and let him do it on the left side."

Engineering college student with hydrocele, at the Outpatient department.

"Doctor my kidney is swollen".

[That's the amount of anatomy that some of our university young men know!]

A. Q. M. C. girl at the Ophthalmic hospital.

"Doctor, I am suffering from 'S. P. C. K.'"

Topics in Brief.

VARIOUS USES OF "TAKLI": (a spinning contrivance)

1. Testing Knee jerk and other reflexes,
2. Paper file,
3. Probe,
4. Stitching together flaps of Thick-skin, like a cobbler,
5. Fishing out foreign bodies from ear, nose, throat, etc., etc.

'Unna' came back from the hospital after an attack of dengue and his son it seems accosted him by asking, "yes, Dad; but where is the baby?"

It is reported that a student in the Mental hospital clinic described a case as exhibiting "Vituperation, vandalism, and fatuousness". The student was interned at the mental hospital for using such laborious words.

Recent excavations in Palestine go to prove that Queen of Sheba went to see King Solomon not to admire his wisdom but to learn "Mother-craft," as to how he brought up his babies.

A Fresher was trying to be polite to a fair class mate at the Graduates' Social and after much thought "brought forth" a compliment and said, "Miss—your presence makes me lose my appetite". The poor lad was surprised to see the fair one shifting at once to a farther seat.

The Little one after an evening listening to the Corporation broadcasting returned home and that night after prayer paused a moment and added, "To-morrow night at this time there will be another prayer."

"Matrimony" says a Bachelor professor, "is an institution of learning, in which a man loses his bachelor's degree without acquiring a Master's".

A contractor advertised for 100 wooden "sleepers". By return of post he received a letter from one of our Professors offering him his whole class on reasonable terms.

My barber says he knows a bright spot where there is no parting!
 "Why is bald head like heaven?"
 "Because, there is no parting there."

At a reception to the graduates a certain gentleman said the following encouraging words to the guests of honour: "To most of you life will be a losing battle all your life."

'Unna' was at the beach with his large family during the "144 days," and was arrested for being a member of an unlawful assembly and afterwards after apologising for producing it, was released.

Some Thoughts.

THE TASK.

To build a character both pure and strong,
 To bravely stand for right, resist the wrong,
 To climb the mountain path and sing faith's song,
 And go where He may lead;
 This is one's task.

To give oneself with all one's power to God,
 To live the life that's lofty deep, and broad,
 To walk with courage steadfast, heaven's road,
 And listen for His voice;
 This is one's task.

G. E. L.

Lord Lister.

"Lister introduced a new regime, in which hope grew and confidence flourished; this has reacted on the surgeon himself, and produced a new type, in which gentleness and carefulness have replaced reckless rapidity. Lister himself as an operator, was deliberate and cautious; rarely did he do anything theatrically showy, although I have seen him remove two stones from a bladder by lateral lithotomy in fifty seconds; but this was an unusual episode; and the applause which followed was to him most distasteful. He, more than any other, may be looked on as the ideal surgeon, both in character and work—humble, and no eye to his own advantage, and yet "valiant for the truth"; courteous to all; and ready to take every trouble and sacrifice himself in every way to help his patients, *thinking first of them* and of their welfare. One's personal observation of him made one realise that he considered himself a man with a mission, viz., to demonstrate to the world that the rapid and uneventful healing of a wound was an inherent possibility in all human beings, if only Nature were not interfered with inimical external influences. *Many a time has one watched him wait for a few moments, when all was ready, with knife in hand extended over the patient, and one felt that he was looking upward for that help which was suggested of old in Ambrose Pare's Dictum:*

I dressed the wound; God healed the Patient.

This was Lister the intrepid pioneer, the universal benefactor, the great surgeon, the perfect gentleman.

ALBERT CARLESS.

Sir William Osler's three personal ideals.

1. To do the day's work well and not bother about to-morrow.
2. To act the "Golden Rule", "Do unto others as you would have it done to you," as far as it lay in me, toward my professional brethren.
3. To cultivate a measure of equanimity, to bear success with humility; bear the affection of my friends without pride and to be ready when the day of sorrow and grief came, to meet it with the courage befitting a man.

SIR WILLIAM OSLER.

Association Notes.

The most unique event in the activities of our Association this year is the reception given to the new medical graduates by the Association. Unlike the previous years, the students were At Home to the graduates and the College Staff. We hope this practice will be continued in future.

Though the details of the function are still fresh in our minds they are worthy of being chronicled.

The expenses of the day were met by the Association funds; and though we had collected special donations from the students, we did not utilise them, as we were within limits.

The securing of a hall for the function was a difficult problem until when Miss Manickam, final year class representative, came forward with the suggestion that we could secure the new Anatomy Hall.

With the kind co-operation of Mr. C. David, Mr. Isaac David, Mr. K. Rama Rau, Mr. Purushotam Pai, Mr. Rayan, and Mr. J. Selvam, and under the immediate supervision of Mr. F. Mascarhenas who had only one clavicle intact (!) the hall was tastefully decorated. Seating accommodation for 900 persons was provided and at the rear end of the hall was erected a gallery by Mr. Isaac David, which accommodated 150 students ("Howlers" as they were called) who rendered great service by keeping up the spirit of the waiting audience, singing "Rio Rita", "Old Medicoes never Die", "You are always in my arms", "Sweetheart we need each other", etc., and clapping at the end of each song, just to show their appreciation of their own efforts at being Musical!

The programme opened with an overture by the Military students, which, like the lean kine of pharaoh's dream, swallowed the noise and commotion of the feminine tongues and Howlers.

Miss B. Mahadevan, Miss L. Sharada, Miss N. Lalita, and Miss S. Mahadevan showed how skilfully they could play on strings of different tension, and the result was

"-----a winding bout

Of linked sweetness long drawn out!"

In fact they charmed even the "Howlers" into silence.

The English Farce "Where's your wife?" was put up by Miss Higgins, Miss College, Mr. Isaacs, Mr. Vaughan and Mr. Pereira. We offer them our thanks and congratulation. Mr. Venkatachar seems to be a mimicry specialist. He made such a grand show that I hear, some students are even now trying to imitate him in the class when the lecture assumes a sleepy tone.

The Piano Solo by Miss L. Davies was much appreciated.

The Tamil Drama gave the audience what they wanted. Mr. N. Sreenivasan and Mr. N. Chandrasekaran shaped well as theatre stars. The Heroine Miss.....Oh no, no, it was Mr. Shunker of the pre-Registration class who did his part so well that if one had not heard his voice or seen his face he would have been easily mistaken for a She!

On the whole the function was a capital success and our thanks are due to Lt.-Col. Pandalai and Dr. Mangesha Row, who gave their time and energy unstintingly.

Teacher.—"The Mississippi is called the 'Father of Waters.'"

Little Boy.—"If it's the 'Father of Waters,' why do they call it Mrs. Sippi?"

Precaution.

Stoney.—"When I left my last digs the landlady burst into tears."

New Landlady.—"It won't happen here. You have to pay in advance."

"I think marriages are really made in heaven, don't you?"

"Well, if all men took as long to propose as you, most of them would have to be."

University Training Corps

BY MR. VISWANATHAN.

The year began like all years, with new promises, new hopes and aspirations and with more than the usual number of new faces. There was not much of enthusiasm displayed by the students to join the Corps in the beginning, but there was sufficient response to make up a respectable total, thanks to the efforts of the Principal and Prof. Sundara Reddi who took personal interest in the recruitment.

Attendance at parades has been good, although a full strength is "a consummation devoutly to be wished". We worked harder than ever, so as to give a much better account of ourselves than hitherto in the competitions during Camp. We were looking forward for fresh laurels and were working ourselves to a pleasant feeling of satisfaction with ourselves for the good work done and the anticipation of trophies to be won, when "the shell burst and the Camp exploded," leaving behind regrets and keen disappointment! The routine work is being carried on with a distant hope of having a Camp at least in Christmas.—The government has cancelled the usual camp this year.

Tuition, Please!

The suburban resident rushed into the police station and exclaimed: "They say you have caught the man who broke into my house last night?"

"Yes," replied the sergeant. "Do you want to see him?"

"Do I want to!" replied the householder. "I want him to tell me how he got into the house without waking my wife."

The Spirit of Locarno.

"What a lovely fur coat you've got—what did it cost?"

"One kiss."

"That you gave your husband?"

"No, that he gave the maid"

Fourth Year's Outing

By ??

Not the whole fourth year, only a batch, a handful, nineteen in all, six of them Fair class-mates of ours. The proposal to have a day out was warmly welcomed by all and even some of us who are in the habit of ticking off the days left for the University examination on the calendar agreed gladly that a day off would do us no harm. So there we were at 7 a.m. on the morning of Friday the 19th of September at the Central station platform. We were going to Ennore. We boarded the train and in a short while reached Ennore station. Leaving the transportation of our articles in Pondy's care (Pondy has by popular vote been elected 'father' of the class) we wended our way to our hired Bungalow, a swell place.

All arrived, we were waiting for Pondy, for he was escorting the cart bringing up our nourishment. There he was in the distance. Now he had reached. Unloading was a moment's work, and then started the fun. What a voracious appetite some of our fellows have! What an amazing capacity for putting away whole junks of bread and butter. There I was in a corner, with a bun, watching and marvelling at these prodigious manifestations of jawing away the eats. They had finished at last, and we all looked about for something to sip. Some coffee or perhaps some tea. But Pondy, the blighter, had forgotten to unload the coffee tin. Didn't we swear at him.

We contented ourselves with some lime juice and then sped on our boating trip. What a gay scene! Multicoloured sarees—why? a sort of henley—but there were only two boats and the spectators happened to be ourselves. We had a dip in the back waters and returned and then the most interesting part of our programme came off. Nearly every one of us sang a song, including Pondy—even I, who do not remember having sung for close on seven years now, joined in the chorus of Rio Rita, but had to drop off promptly when I perceived a tortured look on Miss—'s face after I had sung a line.

And now there was a surprise awaiting us, some indoor games, kindly brought to amuse us by our Lady friends (Bless them they are

a sporting lot) and one of these particularly I must relate, for it concern me so nearly.

The name of the Game: The Elephant without a tail. We had to be blindfolded one by one and affix a tail to a huge big elephant drawn on a piece of paper. All of us tried, one let it rest on the back, another drew it on the leg. A third thought nothing of joining it to the trunk, and a fourth worthy drew a sinuous line somewhere in the animal's tummy, so very like a radiogram of some chitinous reptile in Jumbo's bowels. My own turn came, and I drew the consolation prize. It was a priceless effort. I proceeded in a precise manner. A span above the bottom of the paper, four fingers from the right hand edge, there, the tail was there. I drew a line. I heard a giggle of laughter. The blindfold was removed and behold the result. A tail wafting in mid air, between the huge animals hind and fore legs. What a loss of the sense of Relativity! What would Einstein say? Yes, I had won the consolation prize. The prize distribution was presided over by Miss—. It was a huge parcel I got, which took time to unravel. Ultimately I got at a small packet on which was written "some sugar to sweeten you"; nothing like tasting it, I did taste it. It was Mag. Sulf! Wasn't there a laugh? And so passed the time. Some more games concerning archbishop's coloured caps, ships with mysterious cargoes and we set about to have one more bite. "AlJolson's" inherent artistry in laying the table was very warmly commented on. This was about 4-30 p.m. We had tea and then proceeded slowly to the station where we discovered the Missing coffee tin. At about 7-30 p.m. we got down at Central station still laughing on hearing of a certain Aberdonian who got married and left on his honeymoon alone.

"Sprue" its Investigation and Differential Diagnosis*

BY DR. K. NARAYANA MURTHY, M.B., B.S.,

Madras University Research Scholar.

The diagnosis of sprue is important chiefly on account of the other diarrhoeas which simulate it. The insidious and protracted character of the disease, with symptoms so variable in severity and type, makes us in a large number of instances to miss it and allow the disease to pass on through the three different stages, mentioned in my last paper. A typical case of sprue can be diagnosed without any difficulty especially if the case happens to be in an endemic area. But when the symptoms and signs change sprue escapes identification.

In arriving at a diagnosis, the history is obviously of prime importance. Diagnosis of a case of sprue in a European with a history of residence in the Eastern Tropics, where he had suffered from dyspepsia, occasional diarrhoea, lassitude and intermittent sore mouth is simple enough. But in an Indian it is not often the case. In most of the cases there is some sort of history of diarrhoea, preceding the onset of the disease. The first phase generally escapes detection, because the early symptoms do not so much worry the patient. Most of the cases I have seen are diagnosed in either the second or the third phase of the disease. It is very difficult to say which of the chronic diarrhoea cases pass on to a clinical condition of sprue. Yet one can say this much. That all neglected and improperly treated cases of Flexner and Morgan infection, of the gut, are likely to develop the clinical syndrome of sprue.

The diagnosis of sprue from its clinical standpoint is to be based upon the following cardinal symptoms (1) Morning diarrhoea with frothy clay coloured stool, the colour of the stool in an Indian often being brown or greenish yellow, partly due to less quantity of fat and presence of leuco-bases, (2) Boggy, blown out abdomen, (3) Glazed and ulcerated

* (Continuation of the article on Sprue published in the previous Number). A paper read before the British Medical Association, South Indian Branch, under the presidency of Major-General C. A. Sprawson, C.I.E., V.H.S., I.M.S., Surgeon-General with the Government of Madras. Our thanks are due to Lt.-Col. J. M. Skinner, Honorary Secretary, for permitting us to publish this in our Magazine.

tongue, (4) Progressive emaciation with anæmia but without temperature and (5) the disease being marked with remissions and exacerbations.

The laboratory investigations that are to be made to clinch the diagnosis are the following :—

1. X-ray examination after a Bismuth meal. This method sometimes serves a useful purpose in checking the diarrhoea. In a large majority of the cases I have seen Skiagrams taken, at the following hours. The first photo was taken almost immediately, in prone and supine positions. The other pictures were taken at intervals of 15 mts., $\frac{1}{2}$ hr., 1 hr., $1\frac{1}{2}$ hr., 2 hrs., 3 hrs., 6 hrs., 12 hrs., 24 hrs., and 48 hrs. In those cases it was found that the contents of the stomach passed into the small intestine in less than three hours. The duodenal cap in a few cases was found to be indistinct. The process of digestion, I suppose to a great extent takes place in the small intestines, especially it is found to be so in the case of a vegetarian, where there is no need for peptic digestion to take place in the stomach. This extra amount of strain thrown over an exhausted system brings about first an atrophy of the mucous membrane which rapidly desquamates. Finally, the whole of the small intestines become atrophic and in the X-ray photographs show a rapid emptying of its contents. Such a condition may possibly be due to (1) undigested particles of food irritating the small intestines (2), undue strain thrown over this portion of the intestines and (3) the small intestines sharing the general emaciation of the whole body. In the large intestines we find ptosis, distention, diverticulitis, stasis and ulceration of the gut. The distention is most probably due to gas formation and partly due to the atony of the musculature of the gut. The circular muscle fibres seem to be more affected than the longitudinal muscle fibres. Stasis may be at the cæcum or at both the flexures or at the sigmoid. The distention in the whole of the colon is so great that it is mistaken for Hirschsprung's disease. The food remains in the large bowel for a much longer time, than in the stomach or small intestines and so fermentation and distension take place. The large intestines rapidly emptying in gushes as it were during morning hours and so the motions are frothy bulky and contain much gas. The motions stop of their own accord if the large intestines become empty. In the hospital cases since the patient is put on a restricted diet and is undergoing treatment, the characteristic morning diarrhoea during the early stages of the disease is not noticed.

Thus the bismuth meal photographs give us a clue to the diagnosis of the disease. In many of these cases, when other positive evidences were lacking, a bismuth meal greatly facilitated the diagnosis. The ulcers revealed therein were in favour of post Flexner theory of infection.

2. The second thing is to do an agglutination test with the serum of the patient against Flexner and Morgan group of organisms. In a majority

of the cases, where the history of dysentery was lacking, I had positive results by the above test giving a strong agglutination reaction to a titre 1 : 160 against Flexner. Thus this test gives information, when it is lacking in the history of the case. I suggest that this test can be adopted as a routine in the examination of all cases of sprue.

The third laboratory method of diagnosis is to do a fractional test meal. This is a very important test and perhaps the only test which greatly helps to distinguish sprue from a case of Addisonian anæmia. This test was not done as a routine in many cases at the school of tropical medicine; but I had the opportunity to study them in the cases that were admitted under Col. Malcomson. The total acids, as well as the free hydrochloric acid were found to be remarkably diminished, but the chloride content was found to be progressively higher. This high chloride content is thought to be due to pyloric atony and consequent regurgitation of the duodenal contents into the stomach. Fairly, Mackie and Malandkhar in 1926 had similar results and they called this condition as "Neutralisation achlorhydria". McLean, Griffiths, and Williams in 1928 showed in their experimental dogs, that the chlorides and Hcl. were secreted by the stomach, the former being lower at a time when the latter was high. When this is the case it is important to devise a method by which one can find means of differentiating true achylia gastrica from "Neutralisation achlorhydria". The best method so far known is to inject subcutaneously 1 c.c. of 1/1000 solution of histamine hydrochloride and estimate the total acidity after an Ewald test meal. In 17 cases Gompertz and Vohaus (1925) which showed no Hcl. showed in 59% of them free Hcl., after histamine injections. Bloomfield Wyckoff in 1927, found free Hcl. in two of their cases of achlorhydria, after histamine injections. After the usual test meal histamine stimulates the oxyntic cells, if they lie dormant and do not show the free Hcl. in the stomach.

This test is important in the sense, that it gives roughly an idea as to what extent the free Hcl. is defective. In a majority of the cases, hypochlorhydria was found. In two cases there was complete absence of Hcl. and both of them had the blood picture of pernicious anæmia. If these two cases show achylia gastrica after histamine injections I believe one is justified to expect the development of a true Addisonian anæmia. I have drawn a few graphic charts representing the total acids, free Hcl. and total chlorides in my cases of sprue. From them I could not read any relationship existing between the total acid or free Hcl. to that of the chlorides. A few cases did not show the presence of bile in the stomach contents, yet they showed a high value of the chloride content. The converse was also true, viz., where bile was found in the stomach there was no high chloride content in the samples. It does not seem to me that

any relationship exist among the chlorides and the free Hcl. and total acids. Why this is so is not easy to explain.

The fourth method is the estimation of the total fat, neutral fat and fatty acids in stool. This test does not throw much light on the diagnosis of the disease. In an Indian the fat contents of the food is very low. "The estimation of fat in the stool of such a case is bound to be very much less. At the Tropical School in a great majority of the cases fat estimation as a routine was not done, because (1) of the technical defects in the methods of fat analysis (even with Saxon and Holt methods), (2) of the erroneous results that we are likely to get in patients that are fed on milk diet, which diet was necessarily to be given before the investigations are made and a satisfactory diet is prescribed and (3) it is of no assistance by the way of diagnosis and treatment. Sokhey and Malandkhar (1928) attached no importance to this test, as they had found the fat content of the faeces of patients suffering from other diseases and were on milk diet, was almost the same as that of the stool in cases of sprue. Yet it is possible that this test is of value in determining the prognosis of the case, if we know the total intake of fat, since the fat in the stool is found to decrease in proportion to the improvement of the case.

The fifth important laboratory investigation is the bacteriological examination of the faeces. I had outlined in my previous paper the findings that were got, at different stages of the disease and the different media that could be used with benefit for identification of the bacteria. Repeated examination of stool is often necessary, to arrive at a correct diagnosis. In some of the cases 6—8 times of examination of stool became necessary before pronouncing the diagnosis. In all cases of sprue, as a routine the faeces ought to be examined for these three groups of organisms (1) Flexner (2) Streptococci and (3) Monilia.

The other laboratory investigations that have to be necessarily made to gauge the prognosis are (1) a complete cytological examination of blood (2) the van den Bergh test, (3) the inorganic and organic calcium content of the serum and (4) the blood cholesterol.

No cytological examination is complete without finding all the following: the percentage of haemoglobin, the absolute count of the R.B.C. and the W.B.C., the colour index, the average diameter of the corpuscle, the abnormal cells and a reticulocyte count. The blood picture of a case of advanced sprue is indistinguishable from the blood picture of a case of Addisonian anaemia. In two of the cases the blood picture was identical with the pernicious type of anaemia and both had a high colour index. I have done almost a complete haematological examination of 27 out of 33 cases and the results of this investigation, I hope to publish in the Indian Medical Gazette.

Price Jones's curves are elaborate and tedious, but one with the Eves halometer (1928) can read more or less accurately the diameter of the corpuscles in less than half a minute. In severe cases of anaemia, the average corpuscular diameter is found to be high. If the diameter of the corpuscle is getting smaller, it means the patient is progressing. With this instrument the normal diameter is found to be 7.6 microns in the dried unstained film.

A graph can be marked to show the curves of the R.B.C., the percentage of haemoglobin and the reticulocyte count. The reticulocytes are found to decrease progressively as the R.B.C., and haemoglobin increase.

The van den Bergh reaction varies with the condition of the blood. If the blood picture is one of Addisonian anaemia, it is bound to give an indirect positive reaction and a bilirubin content of more than 2 units. Mc Nee (1923) considers that 0.6 units of bilirubin is normal. Schiffs (1927) is of opinion that 1.2 units of bilirubin in blood is indicative of some pathological change. This test is not of much significance except for the fact that it shows, whether there is haemolysis or not.

The test for serum calcium does not very much help in the diagnosis. In four cases admitted under Col. Malcomson the calcium content was found to be 7.8 mgm., 10.2 mgm., 11.8 and 12.5 mgm., respectively. These figures are roughly about the normal. But when there is depletion of calcium lactate, parathyroid can be given to the cases, sometimes with great benefit. But Linder and Harris (1930) have shown that calcium salts and Ergosterol were without effect in treatment of cases of sprue, until the fat in the diet is reduced.

The next investigation of the cholesterol content of the serum is of some importance, if we know the cholesterol content of the food taken by the patient. Fairly reports a rapid rise of cholesterol in the serum occurring in cases fed on a high protein diet or on liver extract. But Newham, Morris and Manson Bahr (1926) found hypo-cholesterolaemia, which had no relationship to the degree of anaemia. In some other diseases as in pernicious anaemia, we are likely to get a low cholesterol content.

The above four tests have to be done as a routine, since they help partly in prognosis and partly in instituting the right kind of treatment. From the point of differential diagnosis these investigations do not very much help.

The last investigation, which is of a very doubtful nature is the blood culture. Mackie and Gore (1928) seem to have isolated a pleo-morphic organism allied to *B. mallei* from blood in one case and in another from the duodenal content. The authors themselves are silent about this observation and therefore the test is of sequence.

Differential diagnosis.—The principal diseases with which sprue is likely to be confounded are: (1) Hill diarrhoea (2) Low morning

country diarrhoea (3) Chronic dysentery (4) Chronic pancreatitis (5) Certain flagellate diarrhoeas (6) Famine diarrhoea (7) Coeliac disease (8) A diarrhoea common in Indian women during puerperium called "Sutika" (9) A diarrhoea in young adult Indians often associated with a pernicious like anaemia called "asthenic diarrhoea" (10) Tubercular enteritis (11) Stomatitis (12) Mucus diarrhoea in infants (13) Steatorrea (14) and lastly pellagra.

Next I shall just mention some of the clinical signs and symptoms of those diseases which are not found in sprue. By this means to a great extent there is a possibility of diagnosing the disease. The first disease which has a close resemblance to sprue is hill diarrhoea. Certain hill stations and sanatoria in India have a predilection to produce diarrhoea in the Europeans. Cases have been reported from Simla, Darjeeling, Nainital and such hill stations on the Himalayas, but Coonoor and Ooty are comparatively free. History of residence alone of the hill stations with absence of mouth symptoms, and almost immediate relief brought about by change from the hills, clinch the diagnosis.

Low country morning diarrhoea had been described by Castellani occurring in Ceylon and its symptoms are almost identical with hill diarrhoea. The same points of distinction I pointed out above differentiates it from sprue.

Chronic dysentery especially the amoebic form can be diagnosed by the absence of mouth symptoms by the motions not being typical, by the presence of blood, mucus, vegetative form of amoebae or its cysts, charcol Leydan crystals, griping and tenesmus, and a thickened sigmoid and descending colon. Chronic bacillary dysentery is not easily distinguished from sprue.

Chronic Pancreatitis.—The distinguishing symptoms of this disease are absence of mouth symptoms, presence of tenderness in the epigastrium and the passing of cammidge crystals in the urine. These point out that it is chronic pancreatitis. The presence of cammidge crystals is not decisive as they are found in other diseases also.

Flagellate diarrhoeas.—Certain flagellate like *Giardia intestinalis*, *Chilomastri mesenili* etc., may simulate sprue, but the identification of the flagellates or their cysts clinch the diagnosis.

Coeliac disease.—This is a fairly common disease among infants between the ages of 1-5 years. The pathology of this form of infantile diarrhoea and the diarrhoea in adults often known as 'diarrhoea alba' or

'diarrhoea chylosa,' is the same, yet the former disease is more frequently met with in children.

Famine diarrhoea.—This is a fairly common condition met with in India. Diagnosis is based on history of starvation, fatigue, diarrhoea with blood and mucus and wasting rapidly in a short time without evidence of tuberculosis.

Sutika.—This disease was first noticed in Bengal. It begins with diarrhoea some 2 to 3 weeks after delivery. The stools are passed 5 to 15 times a day. They are watery, frothy and fermenting, but contain no mucus or blood. There is loss of appetite and symptoms of dyspepsia are present. No vomiting, no griping or abdominal tenderness can be found. There is an irregular fever lasting for months. Oedema of the feet may be noticed as a late symptom. The course of the disease varies. Absence of tongue symptoms, fever and the history of the disease coming after delivery clinch the diagnosis.

Tubercular enteritis.—Temperature and absence of tongue symptoms and ascites differentiate it from sprue. At times signs of tuberculosis elsewhere may be found. Guinea-pig inoculation with the ascitic fluid if present reveals the presence of tubercular bacilli.

Stomatitis.—All forms of stomatitis may be accompanied by diarrhoea. The stools however are not characteristic e.g., they are not greenish brown, frothy, and copious. Mucous diarrhoea in infants, steatorrea and Pellagra are other uncommon diseases that have to be distinguished from sprue. In the last of the three diseases disturbance of the alimentary tract is usually an early symptom. Stomatitis and salivation are common. The mucus membrane is red, ulcers may appear and the epithelium is stripped off leaving a raw surface. There is also diarrhoea, and sometimes dysentery, often severe, the stools being serous or bloody. This condition may alternate with constipation. But skin lesions and a study of the stool mark it off from sprue.

I am inclined to believe that most of these diarrhoeas especially, the Hill diarrhoea, "Mucous disease of infancy," 'sutika' and 'Asthenic diarrhoea' in young adult Indians often are associated with a pernicious like anaemia and are all probably due to secondary infection of the gut with streptococci, as post Flexner phenomenon. All my cases improved very well under vaccines prepared from the streptococci. These streptococci are often hæmolytic and as I have said before, can be recovered from urine or faeces. My clinical and bacteriological findings seem to be in agreement with the pathological findings of Dr. Bhaskaramenon in his 800 autopsies done at the General Hospital Madras.

(To be Continued).

Unconsciousness

By DR. S. T. ACHAR, M.B., B.S.

Unconsciousness is a condition where the conscious mind is in abeyance; as in normal sleep, hypnotic states and in certain primary affections of the cerebrum.

If very sudden and transitory it may be due to syncope, petitoral or arterial or aural vertigo. If prolonged, the causes are:—

(i) *Vascular, etc.*

- (a) Syncope, including Stokes Adam's disease.
- (b) Concussion and compression.
- (c) Cerebral hæmorrhage, embolism and thrombosis.

(ii) *Inflammatory, etc.*

Meningitis, Encephalitis, Intracranial abscess.

(iii) *Degeneration, etc.*

General Paralysis.

(iv) *Idiopathic.*

Epilepsy.

(v) *Toxic.*

- (a) Uraemia—Kidney disease.
- (b) Diabetes—Pancreatic disease.
- (c) Cholæmia and acute yellow atrophy—Liver disease.
- (d) Poisons—Alcohol, opium, datura, cannabis indica.
- (e) Certain General Toxæmias.

(vi) *New growths* of the brain.

(vii) *Peculiar to tropics:*

Heat stroke of cerebral malaria.

In investigating a case of unconsciousness, the chief points to be considered are:

(i) *History*, if obtainable, from a relation or friend of,

- (a) Previous attacks, which suggest epilepsy, syncope, intracranial vascular lesion and general paralysis of the insane.
- (b) Habits—alcohol, opium, etc.
- (c) Fits—epilepsy, cerebral tumour, heart disease.
- (d) Polyuria—diabetes, uræmia and cerebral hæmorrhage.

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(e) Headache and vomiting, intracranial tumour, meningitis and uræmia.

(f) Periodic fever—malaria.

(g) Mode of onset—If sudden, it suggests syncope, embolism, epilepsy and hæmorrhage. If gradual, encephalitis, intracranial abscess, and various toxæmias.

(h) Trauma, or exposure to sun—concussion, extra dural hæmorrhage, heat stroke.

(i) Ear disease.

(ii) *Examination of the patient.*

(a) *Age:—*

Children—Meningitis, epilepsy, intracranial tumour, and at onset of acute specific fevers when there is also a history of concussions.

Young adult—epilepsy, meningitis, trauma.

Middle age and above—Diabetes, uræmia, cerebral apoplexy.

(b) *Signs of injury* to the head and other parts—suggests concussion, hæmorrhage.

(c) *Position of patient:—*

*Body:—*If on his back, with the muscles flaccid, it suggests syncope, post epileptic coma, concussion and toxic states. If one limb is flaccid and the other drawn up (hemiplegia) an intracranial vascular lesion is the most likely cause. If curled up to one side the limbs flexed—cerebral irritation.

*Head:—*Conjugate deviation of head and eyes suggests cerebral hæmorrhage. If there is retraction of the head, cerebro spinal meningitis is the probable cause.

(d) *Colour of face:—*

Pallor—syncope, large hæmorrhage flushed and congested—cerebral hæmorrhage, alcohol.

(e) *Eyes:—*

Pupils.

Dilated—Shock after concussion or syncope, toxic states.

Contracted—Opium, positive hæmorrhage.

Markedly irregular—Unilateral, intracranial lesion, encephalitis.

*Low Intraocular tension:—*Diabetic coma.

(f) *Pulse:—*

Slow—Increased intracranial pressure Stokes Adam's syndrome.

Slow, full and bounding with high tension—cerebral hæmorrhage, uræmia.

Full pulse, but not bounding—alcohol.

Rapid and weak—shock and syncope.

Completely irregular and small—embolism with auricular fibrillation.

Thickened radial arteries—cerebral hæmorrhage and thrombosis.

B. P. raised in uræmia and cerebral hæmorrhage.

(g) *Respiration*:—Lowered very much in syncope.

Shallow—syncope, shock, and opium poisoning.

Deep—alcohol.

Hyperpnoea—diabetes.

Stertorous—intracranial vascular lesion.

Hissing—uræmia.

Cheyne-stokes—cerebral hæmorrhage, uræmia.

Odour.

Alcohol—It may have been given to the patient to restore him.

Acetone—diabetes.

Urinous smell—uræmia.

(h) *Temperature.*

Raised—In inflammatory conditions of meninges and brain.

Cerebral malaria, heat stroke, Pontine hæmorrhage.

(i) *Extremities.*

Tone and Knee jerks. Equal—toxic states.

Unequal—Focal brain lesion.

Babinski on one side:—cerebral hæmorrhage.

Babinski on both sides—Post encephalitis.

(j) *Fundus of eyes.*

Papillœdema—neoplasms.

White patches of exudative—uræmia.

Arterio Scleroses—cerebral hæmorrhage.

(k) *Urine* (catheterised if necessary).

Albumin and sugar in small quantities—Found in all varieties of coma.

No albumin—It may still be uræmia.

Acetone and sugar—diabetes.

(l) *Cerebro Spinal Fluid.*

Blood-stained—cerebral hæmorrhage.

Increased pressure, and turbid—meningitis.

(m) *Blood examination.*

No malarial parasites—Still, it may be cerebral malaria as they sometimes escape detection.

Increased urea—suggests uræmia.

ILLUSTRATIVE CASES.

CASE 1.—Unconscious after a fit—Epilepsy.

A young man, a clerk, was admitted into hospital unconscious.

History of a fit in his office followed by unconsciousness. A few such similar fits at infrequent intervals for the past few years.

On examination, no sign of injury, patient lies on his back, pupils normal and equal, pulse 85, normal tension, respiration normal, temperature 98. Extremities—No evidence of paralysis, Jerks normal, Babinski present on both sides. Urine—no albumin. Differential Diagnosis in this case lies between Epilepsy, Cerebral Tumour, Syncope, Cerebral Thrombosis and Embolism.

CASE 2.—Unconsciousness with recurring fits—Status Epilepticus.

A young man, 30 years, was admitted unconscious; with recurring fits. History of Epileptiform form fits since childhood.

On examination, abrasions over the arms, face, marks of lips and tongue being bitten, pupils normal and equal, pulse 100, B. P. 130, respiration normal, temperature 99.5. No evidence of any local paralysis, increased jerks, Babinski on both sides, urine, albumin present. Differential diagnosis in this case between Status Epilepticus, Cerebral Tumour.

CASE 3.—Unconsciousness of short duration—Heart Block—Stokes Adam's syndrome.

A middle aged man of 35 was admitted unconscious, having been picked up near Kotwal Bazaar in that condition, no history available at the time.

On examination patient not deeply comatose, conjunctival reflex present, a bump on the Rt parietal region—head.

Pupils equal, react to light.

Pulse very slow about 25 per minute, with an occasional extra systole (heard at the apex and felt at wrist). B. P. 100.

Heart: slightly dilated, with a systolic murmur in all the areas conducted along carotids.

Respiration normal, lungs-fluid at the left base.

Breath. No abnormal smell, Temperature normal.

Extremities: No evidence of paralysis, jerks normal, no babinski, scars over both legs.

Urine: No sugar, no albumen.

The differential diagnosis in this case lies between Syncope, Concussion, Embolism and Thrombosis, Post Epileptic Coma, poisoning.

An hour later the patient recovered and gave a history of feeling giddy while walking that morning and falling down as a result of the giddiness. For 3 days previous to the fall, he was daily feeling giddy, and momentarily lost consciousness once.

The pulse rate on recovery to consciousness was 60, regular except for an occasional extra systole.

Polygraph taken both when the pulse was 25 and 60, revealed a heart block of 1 in 2. Heart block in the former case with a few extra systoles. In the latter there was no Heart block.

4. Fever and drowsiness following head injury—Traumatic meningo-Encephalitis:

A patient was admitted first into the surgical wards with a history of being knocked down by a train.

He was comatose in a state of concussion, but in a few days he recovered consciousness, a few days later he became drowsy gradually, and showed an evening rise of temperature. He was transferred in this condition to the medical wards.

On examination he was semi comatose emaciated lying on his back; no evidence of paralysis. Both pupils dilated, right pupil slightly smaller than the left. Kernig's sign present, pulse 110, B. P. 90, Respiration normal. Temperature of a septic type, urine normal, C. S. F. slightly under pressure, not quite clear, cells 65 per c.m.m., albumen increased, and colloidal gold test showing a meningitic curve; Blood—leucocytosis.

Now the differential diagnosis in this case is between abscess of the Brain following injury, Haemorrhage, Meningitis.

P. M. showed a rather localised meningo Encephalitis over the cortex of the brain.

CASE 5. Unconsciousness for about half-an-hour, with Hemiplegia—case of cerebral embolism Sec to mitral Stenosis.

A patient was admitted into the ward with giddiness and weakness of one side of the body. He gave a history of having become unconscious while in the bath room, suddenly. He recovered in about half-an-hour but noticed Hemiplegia of the left side. On examination, he was found to have Hemiplegia with Hemianesthesia with Hemianopia.

Heart.—Slightly dilated right ventricle, complete irregularity of the Heart and the polygraph confirmed that it was auricular Fibrillation.

He gave a history of pain in chest, coughs and dyspnoea for about 6 months previously. His auricular Fibrillation was brought under control by full doses of Quinidine Sulph and in about a week, the normal rhythm of the Heart was restored; on auscultation now, it was evident that it was a case of mitral stenosis presystolic murmur and thrill.

CASE 6.—Sudden unconsciousness ending fatally—Cerebral Haemorrhage.

A young Mohamadan a B.A. Student, while witnessing a Hockey match, evidently very exciting, suddenly complained of severe headache and fell down unconscious, and was brought to Hospital. He was only about 25 years, well built—deeply unconscious. He was lying on his back, with conjugated deviation of eyes towards right, pupils dilated, and insensitive. The Right being more dilated, pulse show about 60 per minutes. B. P. 220 systolic and 160 diastole; Respiration hurried, noisy and stertorous, left arm and leg flaccid, Babinski on the left side.

Urine.—No albumen or sugar.

C.S.F.—On doing a lumbar puncture almost pure blood flowed out at high pressure.

No P. M. could be done, but the points in favour of cerebral haemorrhage are the sudden onset, the rapidly deepening fatal coma, the high B. P. and the blood stained C. S. F.

The interesting point about this case is that he was only 25.

Coma in children.—We have had a few cases under this group in the wards and the usual causes in their order of frequency are Tuberculous meningitis, Post Basal meningitis, Supp. Meningitis, Post Epileptic, Staphylococcal, Cerebral Tumour, Syph meningitis, Sinus Thrombosis and Cerebral Haemorrhage.

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A Few Hints on Staining Methods as applied to Bacteria

By CAPTAIN N. SESHADRINATHAN, M.B., B.S., D.T.M., B.S.SC.

In the last issue of this journal Gram's method of staining was described. It is the most frequently used stain for the identification of bacteria. Having known whether the organism is Gram positive or Gram negative, further tests or further methods of staining may be used for identifying, as suggested by the morphology also.

The Gram positive cocci need no further staining for identification nor the Gram negative cocci. The Gram negative bacilli also do not require any further staining. The Gram positive bacilli on the other hand have to be identified by special staining methods. The more familiar bacilli of the Gram positive group are *B. tuberculosis* and *B. diphtheria*, *B. anthracis*, *B. tetani* and *B. welchii*.

The identification of tubercle bacillus is effected by what is known as the acid fast stain.

It will be interesting to note that when the organism was first studied by Robert Koch the tubercle bacillus was alkali fast. For his original staining of this bacillus a stain containing alcoholic solution of methylene blue, and 10 per cent potassium hydroxide was used. The tubercle bacilli alone were found to retain the blue stain when washed in water afterwards. It was Ehrlich who used dilute nitric acid as the decolourizing agent, and aniline methyl violet as the stain. Subsequently he found that carbol fuchsin was better than methyl violet. This method has been modified since and is now known as Ziehl-Neelson's method. It has stood the test of time in spite of modifications.

The term acid fast is used to distinguish those bacilli which are able to retain the stain in spite of being immersed in a dilute acid. The acid fast character is one of degree only. *Bacillus tuberculosis* will withstand 30% mineral acid, while *B. smegma* and *B. leprae* may not stand it. These have to be treated with weaker acids (about 5%) *B. smegma* is also easily decolourized by alcohol. This property is taken advantage of to differentiate from *B. smegma* from *B. tuberculosis*, *B. smegma* in some cases has been found to resist decolourization by alcohol. Then the only method of distinction is by inoculation into an experimental animal. This differentiation is very important in diagnosing tuberculosis of the kidney. In this disease the acid fast bacilli seen in the urine are associated with disintegrated tissue

cells. On the other hand, the smegma bacillus will be found among flakes of blue staining amorphous material. Other sources of acid fast bacilli are the cerumen of the ear, butter, and milk, manure and soil. All these bacilli do not resist dissolution when soaked in 50% antiformin for 24 hours, while tubercle bacilli retain their form, and can be stained by the usual acid fast stain after treating thus with antiformin.

As Ziehl-Neelson's method is the one most commonly used, and this alone will be described here in detail. In reality, the method ought to bear the name of Ehrlich since he had discovered in his later attempts at staining the advantage of substituting aniline fuchsin for methyl violet.

The acid fast character is due to the fact that the ectoplasm consists of a fatty substance and a sort of wax to which are due the double property of taking up aniline dyes with difficulty when unheated, and of retaining them, once taken up, in spite of the action of decolourizing agents. It is this resistance to the penetration of stains that when smears from cultures are stained by the Gram method the staining is so feeble, even though the organism belongs to the Gram positive group.

The chief stain in this method is fuchsin which has been re-inforced with carbolic acid.

The smears of sputum or other material should be as thin as possible and having been dried and fixed in the usual way, is then treated by one of two methods. The cold method requires a long time. The film is placed in a bath of stain and left for 2 hours at 37°C. In the hot method the smear is covered with the stain and left on a stand, underneath which a flame is allowed to play for a few seconds at a time, just enough to produce steam. This is continued for at least three minutes. It is difficult to make the students realize the standard of tidiness and minimum heat required for staining. It is not unusual to see them boil up the stain, spurt it on their clothes, often staining their fingers as well. The tragedy is not so bad for the men students as the women students, when they get these beauty spots, on their clothing! This process of staining is fairly fool proof, and drying or boiling does not interfere with the result, if the next process, viz., decolourizing is thorough, the only danger is that by over heating, when the glass slide often cracks, and in some cases stained bits of glass slides of different shapes are exhibited by the students.

Several slide holders have been devised for holding the slide during this staining process, but none is free from defects.

The next process is the decolourization with an acid. The acid used is 30% sulphuric acid as devised by Neilson. The slide is either immersed in, after washing thoroughly, in water to remove excess of stain, or the acid may be poured on the slide and allowed to act for 20 seconds. It can then be thoroughly decolourized in alcohol for differentiating smegma bacillus etc.

The third step is the counter-staining, to obtain a contrast background for the acid fast bacilli. This consists of an aqueous solution of methylene blue. The usual method employed for convenience is to mix up the methylene blue solution and the acid, so that the second and third steps are combined into one, (known as Gablettis method). The slide is then washed out in running water, dried and examined under the oil immersion lens. The bacilli stand out sharply, red on a blue background.

There are several modifications described, but none has equalled the above method. Mention may be made of two methods.

Method of Spengler:—After staining with hot carbolfuchsin as above, leave in saturated alcoholic solution of picric acid for 2 or 3 minutes. Wash in 60% alcohol and in 15% nitric acid for 20 to 25 seconds. Wash again in alcohol until completely decolourized. Wash in water. Treat with picric alcohol once again. The brilliant red bacilli contrast well against a yellow background. No clear idea however can be obtained of the cellular material in which the bacilli have been found, as in the Ziehl Neelson's method.

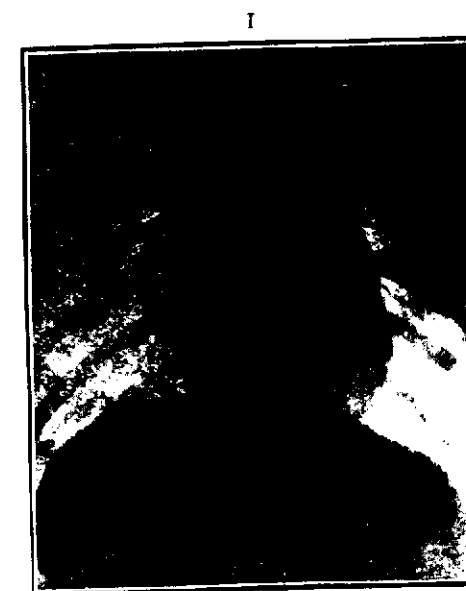
Method of Much:—This brings out the granules of Much into prominence. It is a modification of Gram stain. For details of this method and others the student is referred to books like Calmette's Tuberculosis in man and animals.

(To be continued.)

Heart Disease*

CASE REPORTS I.

BY DR. K. C. PAUL, M.B., B.S.,
Sixth Physician, Madras General Hospital.



* I am indebted to Dr. M. J. Santhana Krishna Pillai, L.R.C.P. & S., D.R.M.E., of the Government X-ray Institute, Madras, for the radiographic findings, and to Dr. R. Viswanathan, B.A., M.B., B.S., Assistant to the First Physician, General Hospital for the polygraphic tracings and the comments thereof.

I

MUTHUKARUPPAN, Hindu male, aged 18 years, was admitted into my wards on July 7, 1930, for breathlessness on exertion of six months' duration.

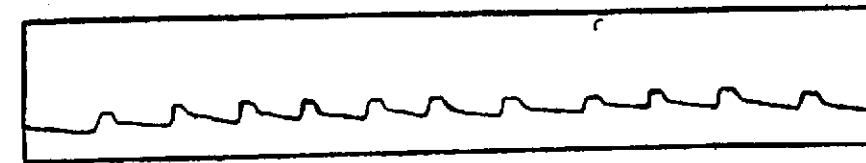
No history of sore throat. Six months ago patient suffered from fever and painful swelling of the joints. On recovery from this he found that he got breathless on exertion. During the last ten days the breathlessness has become more intense and he has developed a cough.

On admission the patient was found to have no dyspnoea at rest. But on exertion it appeared. Cough present.

Temperature, 98.4° F.; respirations, 20 per min.; pulse, 80 per min.

Cardio-vascular System: pulse: slightly irregular, of good volume and tension, well-sustained.

Pulse Tracing.



Apex-beat visible and palpable in the fifth intercostal space, one inch internal to the left mid-clavicular line. Pre-systolic thrill palpable at the position of the apex-beat on exertion.

Percussion: Right border, half-an-inch external to the right lateral sternal line; left border, half-an-inch internal to the left mid-clavicular line; upper border, at level of the third rib.

Auscultation: First sound, snapping at the mitral area. Second sound reduplicated in both mitral and pulmonary areas. Pre-systolic murmur heard in the mitral area (over a spot corresponding to the position of the apex-beat) on exertion. At rest, the murmur is not heard, but the first sound is rough at its commencement.

No other abnormal physical signs.

Radiographic Findings:—A globular heart; showing dilatation of auricles, more so of the left. The left ventricle appear smaller than normal. The aortic area and that of the superior venacava are normal in size. The appearance is suggestive of mitral stenosis.

Nil abnormal in diaphragm.

Diagnosis: Early mitral stenosis.

II

MURUGAN, Hindu male, aged 45 years, a ryot by occupation, was admitted into my wards on July 15, 1930, for breathlessness, pain in the chest, and general weakness, of three months' duration.

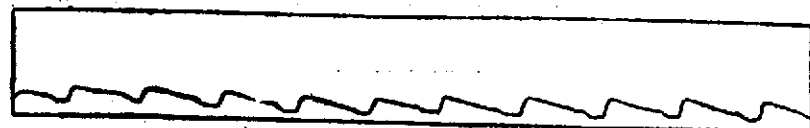
History of fever with painful swelling of joints some months before onset of present complaint. No history of sore throat.

Present complaint began three months ago with pain in the epigastrium, having no relation to the taking of food, and radiating to the shoulder regions. This pain later became generalized. At about the same time he developed breathlessness on exertion. A fortnight ago he became oedematous, the oedema being universal in distribution. The oedema disappeared subsequently.

On admission the patient was found to be dyspnoeic. Temperature, 98° F., respirations, 32 per min.; pulse, 76 per min.

Cardio-vascular System: Pulse, slightly irregular, of small volume, but well-sustained and of good tension.

Pulse tracing.

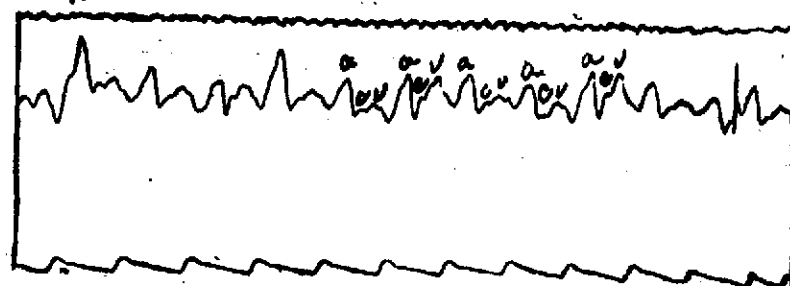


Apex-beat visible and palpable in the sixth intercostal space, half-an-inch internal to the left mid-clavicular line. A pre-systolic thrill is palpable at the position of the apex-beat.

Percussion: Right border, one inch external to the right lateral sternal line; left border, half-an-inch external to the left mid-clavicular line; upper border, at the level of the third rib.

Auscultation: First sound, sharp in the mitral area, but rather soft in the aortic and pulmonary areas. Second sound, accentuated in both mitral and pulmonary areas. A pre-systolic murmur is heard at the mitral area, becoming very distinct on exertion.

No other abnormal signs made out by physical examination.



Auricular form of venous pulse.

Radiographic findings:—General enlargement of heart, the auricle in particular, the aortic bulge coalescing with that of the auricle on the left side. Left ventricle slightly enlarged. The superior venacava region slightly increased in extent in the lower portion. The right cardio-diaphragmatic angle encroached upon by fibrosis. The hilus glands are positive, the left more so than the right.

Diagnosis.—Early mitral stenosis.



II



III

III

MUNIAMMA, Hindu female, aged 12 years, was admitted into my wards on July 7, 1930, for breathlessness of three months' duration and swelling of the lower extremities of ten days' duration.

History: Patient suffered from fever and painful swelling of joints some months ago. No history of sore throat. Three months ago she noticed that she became breathless on exertion. About ten days ago she had an attack of fever and with this the breathlessness became more intense and she developed swelling of both lower extremities.

On admission: Patient is extremely anæmic, face slightly puffed, both lower extremities œdematous. Breathlessness even at rest. Temperature, 99.40 F.; respirations, 22 per min.; pulse, 88 per min.

Cardio-vascular system: Apex-beat visible and palpable in the fifth intercostal space just outside the left mid-clavicular line. A thrill, pre-systolic in time, palpable at the position of the apex-beat. Diffuse impulse over the præcordium.

Percussion: Right border, one inch external to the right lateral sternal line; left border, one inch external to the left mid-clavicular line; upper border, at level of the second rib.

Auscultation: First sound soft in all the areas. Second sound reduplicated in the pulmonary area. A systolic murmur is heard at all the areas. At the mitral area, the systolic murmur is conducted into the axilla. A pre-systolic murmur, becoming well-evident on exertion, is heard at the mitral area.

Both the liver and spleen are enlarged downwards. The lower border of the liver is placed about two inches below the costal margin; the spleen extends an inch below the costal margin. Both these organs are tender.

There is dullness over the lungs at the bases, where the breath-sounds are harsh, and a few rales could be made out on auscultation.

Hæmoglobin: below 10 per cent. (Dare),

Red cell count: just under one million per c.mm.

Leucopenia.

No malarial parasite in the blood.

No ova in motions.

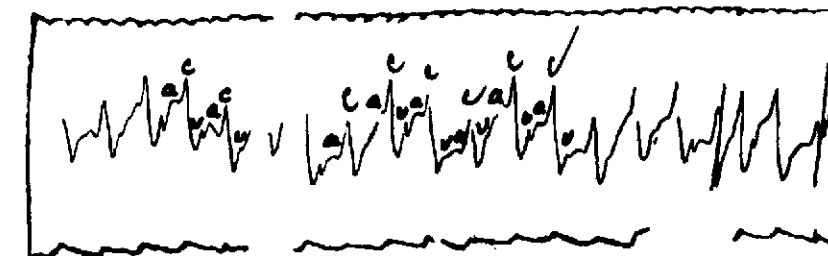
Urine: nil abnormal.

Blood pressure: 110 mm. Hg. systolic; 55 mm. Hg. diastolic.

Patient has been running an intermittent temperature for the first few days after admission since then the pyrexia was practically of the continuous type.

On August 22, a peculiar rhythm developed at the aortic area. Three sounds, the first, the second, and a closely following third, could be heard at this area. This rhythm was strictly localised. On analysis, it was found that the third sound was due to the reduplication of the aortic second sound.

Polygraph tracing made on August 24th.



c waves are prominent and peaked. There is sudden rise and rapid fall suggestive of aortic regurgitation. The third sound heard at the aortic area is possibly a small diastolic murmur.

Blood pressure on August 24: 110 mm. Hg. systolic; 55 mm. Hg. diastolic.

Radiographic Findings:—General enlargement of heart assuming an appearance of the globular variety. The right auricle is definitely enlarged, to a less extent the left. The left ventricle is also enlarged. The aortic area is not increased in size. The left border of the thoracic aorta and the border of the right ventricle shows separately. The lung fields show some mottling around the right hilum in particular. The diaphragm normal in appearance and of the same level on both sides.

Diagnosis: Infective Endocarditis

Mitral stenosis and insufficiency.

(Aortic regurgitation?)

IV

PALAYAM, Hindu male, aged 16 years, a chokra, was admitted into my wards on July 1, 1930, for fever and breathlessness of four days' duration.

History: Patient has, to his knowledge, never suffered from any illness before. Present complaint began with fever which came on suddenly about four days ago. Breathlessness was a concomitant of the fever. These have continued since. He has also pains in the joints, especially of those of the lower extremities.

On admission: Patient is well nourished, not anæmic. He looks very ill, and is dyspnoeic. Tonsils slightly enlarged, and there is sore throat. Tongue is coated with a slight fur. There is cyanosis of the lips. Complaints of pain in the præcordium and abdomen. There is slight swelling of wrists, ankles, and knees, which are also tender and painful.

Temperature, 100°F.; respirations, 24 per min., pulse, 104 per min.; Blood pressure, 120 mm. Hg. systolic; 25 mm. Hg. diastolic.

Cardio-vascular system: Heart's action forcible. Pulse: typical water-hammer or Corrigan, regular.



Diffuse heaving impulse over whole of præcordium. Pre-systolic thrill palpable at mitral area.

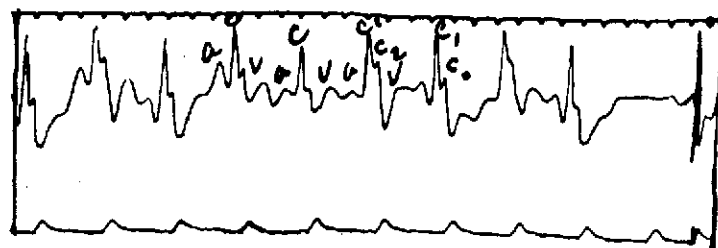
Percussion: Right border, just external to right lateral sternal line; left border, one inch external to left mid-clavicular line; upper border, at the second intercostal space.

Auscultation: First sound loud at all areas. Second sound not heard at aortic area. A soft systolic murmur is heard at mitral and aortic areas. A diastolic murmur, with maximum intensity at the aortic cartilage, and conducted downwards along the left border of the sternum as far as the fourth costal cartilage, is also present. There is a pre-systolic murmur at the mitral area. This is probably the Austin Flint murmur of aortic regurgitation.

Pulsation is visible in the carotic and femoral arteries. On auscultation over the femoral and the brachial arteries the pistol shot sound could be heard. This is a loud shock sound. Duroziez's sign also is present.

No abnormal signs in the lungs.

Liver is palpable an inch below costal margin. The spleen is just palpable below the ribs.



c waves are prominent. Sudden rise and fall suggests aortic regurgitation, c wave is bifurcated.

Blood: no parasites, slight leucocytosis.

Urine: nil abnormal.

Motions: round worm ova.

Since admission the patient has been running a continuous elevated temperature for twenty-five days.

Blood-culture: sterile.

He has been discharged on August 11, free from fever, but with signs of aortic regurgitation.

Radiographic Findings:—Radiograph taken on 2-7-30. Enlargement of left ventricle and right auricle with area of superior venacava suggestive also of over filling. The aortic, pulmonary and the left auricular bulges appear to be fairly normal.

Radiograph taken on 7-8-30. Note the general diminution in the dimensions of the various chambers of the heart including the superior venacava showing the effect of treatment and rest. The lung fields appear clearer than the previous.

Diagnosis. Infective Endocarditis.



IV-A



IV-B

A Case of Tuberculous Meningitis

FROM M-1 WARD.

BY ISAAC J. E. DAVID, FINAL YEAR.

G. A., a young man of 20 years was admitted in S-1 ward on 27-7-30 with hæmaturia and fever, and afterwards was transferred to M-1 ward for medical treatment.

Previous history:—Three months ago patient had an attack of chicken pox and since then has been having low fever.

History of present illness:—Twenty-five days ago patient passed blood in urine on straining after a purgative. He was treated by a Doctor and patient got better and hæmaturia stopped. But he has been having fever ever since. There has been no history of burning sensation during micturition.

Condition on admission:—

27-7-30. Patient is having fever (104°). He passes urine without difficulty two or three times during day time and once at night, and he has been delirious since the last five days.

Physical signs:—Patient is a well nourished boy of about 20 years. He is not anæmic. He is lethargic and slightly delirious.

Nervous system.—Patient is intelligent but slightly delirious on and off. The left pupil is dilated and there is ptosis of the left eye lid. The pupils react to light. Distant objects are blurred and look double (diplopia). There is no other evidence of any cranial nerve involvement. The optic discs are normal.

Reflexes.—The abdominal reflexes are present on both sides. The knee and ankle jerks are normal and the plantar response is flexor. The patient complains of great pain in the thigh and ankle. Kernig's sign is elicited but it causes much pain to the patient. Babiniski's signs are absent. There is no stiffness of the neck. Patient had no convulsions and no vomiting and headache is not marked.

The patient was first suspected to suffer from Encephalitis following small pox.

Investigations made:—

Blood Examinations.
 Wassermann reaction....negative,
 Gel testnegative,
 Widal.....1/25 negative,
 Agglutination for B. Coli-neg.
 Blood picture—no parasite.
 R.B.C. Count—4,410,000.

Hæmoglobin index—65%
 W.B.C. Count—7600
 Differential count—
 Polymorphs—83%
 Lymphocytes—12%
 Large monos—4%
 Eosinophiles—1%
 Mast Cells—1%
 Blood Sugar—Normal.

Motion:—No ova and no amœba.

Urine:—Acid, sp. gr. 1012, albumin nil, sugar nil, acetone nil, deposits are only a little, consisting of a few cells and R.B.C., bile nil and culture negative.

X Ray:—Of skull-nil abnormal.

Cerebro spinal fluid:

- 29-7-30. Moderate increase in pressure, albumin 0.02%; globulin in small trace, sugar nil, and slight lymphocytosis.
 1-8-30. Clear and under pressure, lymphocytes are present, albumin 72.7 mgms%, globulin 40.6 mgms% and sugar 0.104%.
 2-8-30. Culture sterile; guinea pig inoculated, cell count 240 cells per c.mm. They are mostly lymphocytes and there are some polymorphs also present. Spider web clot was obtained from the fluid, and staining by Zeil Neilson's stain showed tubercle bacilli.

Notes taken on progress and treatment:

- 27-7-30. Maximum temperature during the twenty-four hours was 104°, and pulse 124.
 28-7-30. Temperature 103°; pulse 124. The patient gives intelligent answers to questions but is slightly delirious. Lumbar puncture was done and 40 c.c. of clear fluid under slight pressure was drawn out. 40 grs. of hexamine intravenously, and soda bicarb and pot citras each two drachms were administered orally in three ounces of aqua chloroform; and plenty of water was given to drink.
 29-7-30. Temperature 102°4; Pulse 120. Patient had a good motion. He slept well at night after a sleeping draught. The tongue is moist and is coated with thin fur. 30 grs. of hexamine was given intravenously.

- 30-7-30. Temperature 102; pulse 120. Bowels did not move and a successful enema was given. Urine showed no R.B.C. and is amphoteric in reaction. 50 grs. of hexamine was given intravenously. Also soda bicarb and pot citras, and ammonium bromide, sodium bromide and pot bromide each 20 grs. with 2 drachms of syrup in 4 oz. of water, one oz. every six hours was given. These with four pints of water per day is daily given. Two oz. of glucose in six oz. of water, an oz. every four hours was also given to-day.
 31-7-30. Temperature gone up to 103° and pulse is 120. Patient's condition is the same. A few R.B.C. and puss cells were found in the urine which was neutral. The ptosis of the left eye is the same and there is a tendency for ptosis on the right side. Patient slept on and off at night. The usual treatment continued. 15 grs. of soda salicylas was administered intravenously.
 1-8-30. Temperature 103°; pulse 132. Patient is more drowsy and does not take nourishment properly. Both the pupils are dilated, the left more than the right. Lumbar puncture was done again, and 30 c. c. was drawn under pressure. Urine-sp. gr. 1020, acid, albumin nil, sugar nil and no R.B.C. Treatment repeated. 15 grs. of soda salicylas was given intravenously.
 2-8-30. Temperature 103°.6; pulse 160. Patient is weaker, more drowsy, feeds with difficulty and has rapid pulse. 15 grs. of soda salicylas was given intravenously.
 3-8-30. Temperature has risen up to 105 and pulse 160 per minute. Patient's condition is worse. He is very weak, very drowsy, cannot answer questions and efforts to respond is very feeble. Pulse is steady and rapid. Treatment as usual.
 4-8-30. 2-45. A.M. Condition weak, sweating, rapid pulse, respiration hurried. Patient is very restless. Digitalin and strychnine 1 c.c. each was given.
 4-45 A.M. Pulse rapid and very feeble. Cheyne Stokes respiration has set in. Camphor in ether 1 c.c. was given.
 8. A.M. Patient is sweating profusely. Pulse is very feeble and rapid and cannot be counted. Cheyne Stokes breathing is very marked.
 10 A.M. Patient is pulseless.
 11 A.M. Patient expired.

DIFFERENTIAL DIAGNOSIS.

1. Typhoid Fever.
2. Apical Pneumonia. (In children)
3. Meningism.
4. Cerebro-spinal Fever.
5. Encephalitis.

1. **Typhoid fever.**—A negative Widal reaction alone need not exclude Typhoid fever. Occasionally it remains negative even to the second or the third week, or until a relapse occurs, or is altogether absent.

Typhoid fever gives no leucocytosis and in the differential leucocytic count the lymphocytes are relatively increased, and the polymorphs are relatively diminished. The temperature is higher and the headache more severe and irritability and resentment at interference are not present. The decubitus is usually dorsal.

2. **Pneumococcal Meningitis.**—Some of these cases are indistinguishable symptomatically from cases of Tuberculous Meningitis. Others run a very rapid course and present few features other than headache, vomiting and pyrexia, with rapidly oncoming and quickly fatal coma. Cerebro-spinal fluid:—Purulent due to the presence of polymorphonuclear leucocytes containing the pneumococcus.

In some cases the primary focus may be in the form of Empyema purulent pericarditis or peritonitis.

3. **Meningism.**—The term Meningism is used for a group of cases which present symptoms of Meningitis and in which no pathological change can be found, either in the cerebro-spinal fluid or in the meninges or cerebral tissue. It is met with in children in association with acute febrile diseases, and is presumably due to the toxin present. Recovery is usually rapid and complete.

4. **Cerebro-spinal fever.***C. S. Fever.*

Sudden in onset with headache, fever, general malaise, vomiting, high temperature and rigidity of neck, back and limbs. Patient lies with legs drawn up. Leucocytosis of considerable degree (20,000 to 40,000). Prognosis better than in Tuberculous Meningitis!

Tuberculous Meningitis.

Onset is seldom so sudden. The Meningitic symptoms which come on less abruptly are preceded by a long period of malaise. Temperature is not usually high and ranges between 99°-101°. Retraction of head is transient and ill-marked. Photophobia is more common here than it is in C. S. Fever.

A Case of Tuberculous Meningitis

Cerebro spinal fluid exhibits various grades of turbidity, slight opalescence to highly purulent exudate. Relative increase of lymphocytes in early and later stages and sometimes throughout the course of the disease. Deposit got on centrifugalising the C. S. fluid shows on microscopic examination meningo-cocci.

In adults aphasia is often common and is an early symptom. Patient is irritable. True paralytic squint is common. The Leucocyte found affords no differential help as from C. S. fever. A Leucocytosis of considerable size 15,000 to 30,000 may be present in T. B. meningitis. The C. S. fluid is not turbid but clear. Relative increase of polymorphs is found all throughout the disease in this fluid. Spider-web clot obtained from the fluid on staining shows Tubercle Bacilli.

5. **Encephalitis.**—Typical cases do not confuse us. But where meningeal symptoms occur it may be confused with T. B. Meningitis. Meningeal symptoms may be very marked, in the early stages, such as sub-occipital head-ache, painful stiffness of the neck, vomiting and Kernig's sign. Rapidly fatal cases have been reported in which the clinical picture throughout was hardly distinguishable from that of acute meningitis, but none of these cases showed leucocytosis in the C. S. fluid. In the C. S. fluid, at least in one-third of the cases, the cell count is normal. In the rest, there is a leucocytosis consisting entirely of lymphocytes which may reach to over 100 per cubic c.m. Absence of lymphocytes does not exclude meningeal congestion.

Tuberculous Meningitis.—Is a disease of the young usually, but might also occur at any age. It is usually secondary to a focus of Tuberculosis elsewhere and the infection becomes generalized. *In this case the original focus has been most probably in the kidney.*

The disease begins insidiously, occasionally acute in onset. *Early symptoms* are general toxæmia and local effects of lesion. *The general symptoms* are fever, malaise, constipation, etc. *The local symptoms* are headache, strabismus or diplopia, vomiting, increased blood-pressure and sometimes convulsions, especially common in children.

The symptoms can be classified into three stages.—(1) *Stage of irritability*, (2) *Compression*, (3) *Paralysis*.

Irritation leads to cranial nerve stimulation or paralysis. When the second nerve is affected we get papillædema and retinal tubercle. As a result of the paralysis of the third nerve we have strabismus, ptosis, fixation of pupil and diplopia. Affection (stimulation) of the

fifth nerve results in severe neuralgic pain. The seventh nerve is not often affected but when irritated gives rise to facial twitching. The tenth nerve is irritated in the early stage of the disease and we have slow pulse and later when paralysis sets in we have fast pulse. Retraction of the head is due to the affection of eleventh nerve. The cerebral cortex gets easily irritated causing convulsions.

Compression phenomena are due to increased intra-cranial pressure caused by (1) Increased exudation of fluid, (2) Blockage of foramen of Majendie (Internal hydrocephalus). The compression causes headache, vomiting, giddiness, optic neuritis, fits, papilloedema, photo-phobia, delirium, mental dulness, general muscular irritability, Kernig's sign, Brudzkin sign, loss of abdominal reflexes, coma, inability to swallow and finally death. The prognosis of tuberculous meningitis is very bad and recovery is exceptional.

Treatment.—Treatment could be only symptomatic, just to produce relief. Lumbar puncture relieves headache temporarily and could be repeated several times. Bromides, chloral, and other analgesic drugs could be used to relieve headache, check convulsion and diminish restlessness. Hexamine in large doses, inunction of mercury and tuberculin have been largely used without success. General treatment must be that which will secure as much comfort as possible to the patient. Where swallowing is difficult nasal feeding should be adopted.

I am indebted to Lt.-Col. G. E. Malcomson for permitting me to report this case.

Inversion of Uterus

BY MISS P. BELL-HART, FINAL YEAR.

Name R. L. *Age* 22 years. *Previous History*:—2 children, both living. One abortion 2 years ago. Date of birth of last child, April 1930.

Condition on admission:—Patient admitted on 4th July 1930. Her general condition was very poor being anaemic. A tumour in the vagina, and bleeding per vagina.

History of case:—The patient was confined in April at Kalla-Kurchi, and with the expression of the placenta the uterus was inverted, and unsuccessful attempt at reposition was made immediately. The patient was treated for shock and given antistreptococcal serum. The bleeding was controlled with ergot and pituitrin. A month later the patient got dysentery which proved to be bacillary in origin and was treated with antidysenteric sera. A fortnight later she developed serum sickness. She had high temperatures with stiffness and pain in the joints. This condition passed off with treatment, to be followed by her menstruation, in June, which was very profuse and prolonged. With the use of hæmostates and calcium the bleeding was sufficiently under control for her to travel to Madras.

Treatment:—In hospital the bleeding was controlled with hæmoplastin. As the patient's general condition was too poor for any active treatment she was given rest and nourishing food.

On the 18th July the patient's condition improved, an attempt was made at reposition under chloroform and failed.

On 31st July, the patient being improved was operated on. On the table, when the abdomen was opened, a cup-shaped depression was found in the fundus of the uterus, into which the tubes had vaginated. The peritoneum was reflected from the anterior surface of the lower uterine segment. The lower segment was incised and through this the inversion was rectified. The tubes were found adherent to the upper and posterior surface of the fundus, they were freed, and the uterus touched with brilliant green. The uterus was sutured with silk and the peritoneum was sutured. The tubes were tied and removed and the abdomen was closed.

The patient was kept in Fowler's position. On the third day the wound was dressed and found healthy. She had a temperature of 101° for 2 days, and after that it was normal, and remained so till she was discharged on 23rd of August.

At the operation there was a choice of three methods:—

1. Hysterotomy and reposition.
2. Hysterotomy and reposition and sterilisation.
3. Hysterectomy.

In the first two there was the risk of sepsis, which was absent in the last. Against hysterectomy was the patient's age and the effects of endocrine disbalance arising from such an operation.

The tubes were tied and removed at the request of her husband a doctor, to prevent any future risk of pregnancy. I am indebted to Dr. Lakshmanaswamy for permitting me to report this case.

A Case of Tabes Mesenterica WITH INVOLVEMENT OF THE SMALL INTESTINE

BY DR. V. SRINIVASAN, M.B., B.S.,

House Physician, General Hospital.

Chenchia, Hindu Male, aged 23 years, Mason, native of Chingleput, was admitted into General Hospital under Dr. K. C. Paul on 29-7-1930 for tumour and pain in the abdomen of one week's duration. He had fever, of two days duration, a week before admission. The tumour was noticed on recovery from this. Three days after he noticed the tumour he vomited twice or thrice, the vomiting not being repeated subsequently. For the two days preceding admission he was constipated.

He has been in good health previously. His parents are alive and healthy. He is married and has two children.

Condition on Admission.—The patient is a young man of about twenty-five years. He looks ill, is rather emaciated and slightly anæmic. Tongue coated with dirty brown fur, teeth dirty, and Pyorrhoea alveolaris present.

A tumour is palpable in the epigastric and umbilical regions. It is placed rather more in the umbilical region than in the epigastric region. It extends for about two fingers breadth to the right of the middle line and about four fingers breadth to the left. Its lower border is about the level of the umbilicus and its upper border about four fingers breadth below the tip of the ensiform cartilage. It is hard to touch and tender. It is dull on percussion. Surrounding it on all sides there is resonance. It could be pushed into the left hypochondriac region. It presents a notch on its right border. There is a depression across it, the depression being continuous with the notch. The depression gives the tumour the appearance of a 'Hot cross bun'.

The area of splenic dullness could not be made out by percussion. A few enlarged glands can be felt in the groin.

Respiratory System :—No abnormal signs could be made out.

Circulatory System :—Except for the first sound in the mitral area being soft nothing abnormal was detected.

On 29-7-1930	Morning.	Evening.
Respirations per minute	28	28
Pulse per minute	96	100
Temperature	98°F	100°F
on all other days his temperature was normal never rising above 98.5°F.		

The following investigations were made:—

Blood film,	...	No abnormal cells found.
R. B. C.	...	3,930,000 per c.m.m.
W. B. C.	...	5,800 per c.m.m.
Hæmoglobin	...	80% (Dare).
Urine.	...	Specific Gravity 1010.
		Acid.
		No Albumen.
		No Sugar.
		No Deposits.

Motion, No ova.
Well formed.

Differential count of Leucocytes.

Polymorphs	60%
Lymphocytes	23%
Mononuclear	10%
Eosinophil	5%
Mast cell	1%

Examined fluoroscopically, it was thought that the normal shadow due to the spleen underneath the diaphragm was absent.

Progress and treatment.—On the day of admission patient had a soap and water enema given with fair result. Pain was not influenced by same.

Two days after admission, *i.e.*, 31-7-1930 it was noticed that the notch which on the day of admission was felt on the right border was felt on the superior border. Patient's pain was no better and tenderness more marked.

On 1-8-1930 the notch was felt on the left border and there was no change either in the pain or in the tenderness.

The Second Surgeon was called in consultation and an immediate laprotomy was decided on.

Operation notes.—"A small quantity of turbid fluid came out on opening the abdomen: Two coils of small intestine enormously thickened. Mesentery thickened and infiltrated. Lower down several

enlarged and caseating masses of glands were found. The spleen was smaller than normal and was pushed high up under the diaphragm. Stomach and transverse colon pushed high up under the diaphragm and occupied the area normally occupied by the spleen. Tubercles in various stages seen over the small intestines. Abdomen closed with through and through stitches."

The patient was in the surgical ward for a week after the operation and expressed himself much pleased with the result of the operation. He stated that the pain in the abdomen had gone down considerably. He had no temperature and his general condition was fair. It was hoped he would be discharged from hospital in a few days; but he took bad suddenly on 8-8-30, presented symptoms of obstruction and died the same day. No Post mortem examination was available.

Discussion.

On first examination it had been thought probable that the condition was one of tuberculosis of the omentum. But the hard feel, dullness on percussion and large size of the tumour and the very short history, were though not improbable with the condition, considered to be not in favour of this diagnosis. Further the absence of fever suggested tuberculous infection as a remote possibility.

The late onset in life of the disease, and the absence of tubercle elsewhere were thought to be sufficient to exclude *Tabes Mesenterica*, which is usually met with in children; accompanied by chronic peritonitis, and seldom diagnosed during life except when associated with tubercle elsewhere.

The presence of a notch on the border of the mass; absence of dullness in the normal situation of the spleen and the success attending the effort to move the tumour into the left hypochondrium suggested that the spleen was out of place and had come to occupy the umbilical region. The general outline, size, and consistence conformed to such a diagnosis. The evidence of fluoroscopic examination seemed to lend support to this diagnosis. The transverse depression, the situation and the presence of symptoms of intestinal obstruction were against this diagnosis but were held to be accidental or due to tension of the pedicle and pressure on the intestine, the depression being regarded as being due to the rectus.

Other possibilities which were thought of were impacted faecal mass in the transverse colon, and malignant growth of the small intestine; but were discarded for obvious reasons.

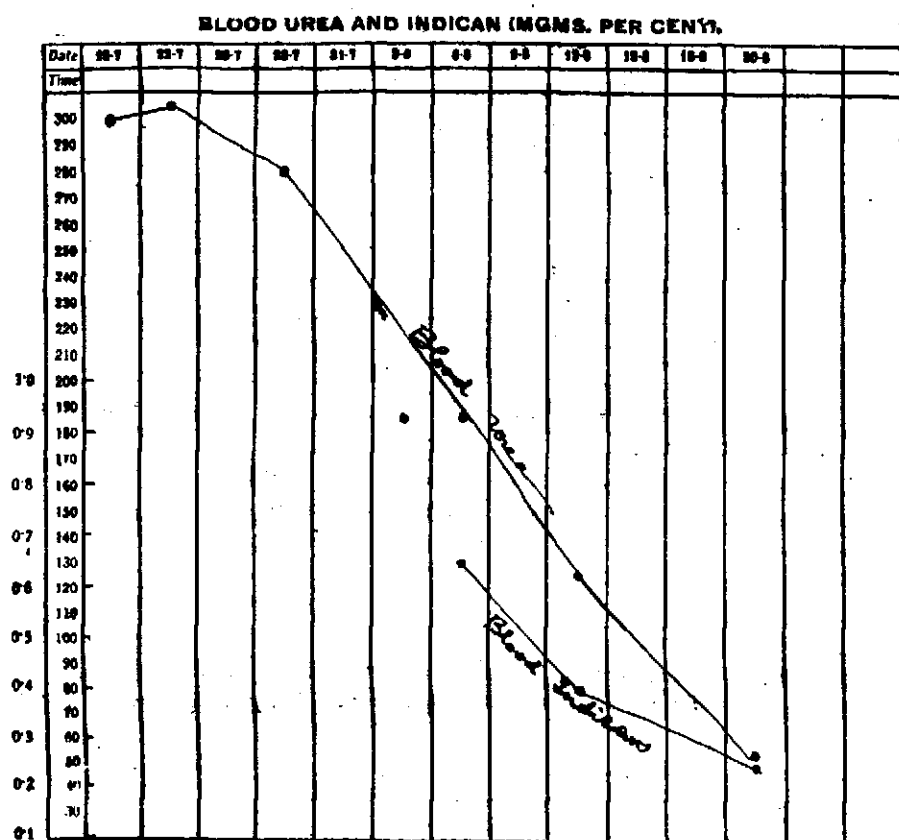
The unusual features in this case were the absence of pyrexia and the short history. One may come across a case without fever or with a short history occasionally but this is rare. Involvement of the intestine producing obstruction is not unusual, but in this case a fairly big tumour was formed. In the clinical picture there was nothing to suggest the actual conditions present.

I wish to express my thanks to Lt.-Col. K. G. Pandalai and Dr. K. C. Paul, under whose care the patient was during his stay in hospital for permitting me to publish the notes of this case.

A Case of Post Choleraic Acute Uraemia

BY DR. ABDUL HADI, L.M.S.,
House Physician, General Hospital.

Name.—Mr. A, 52 years old. *Admitted.*—17.7.30.
Race.—Hindu. *Discharged.*—21.8.30.
Residence.—Triplicane. *Diagnosis.*—Post-choleraic, Diarrhoea and acute uraemia.
Occupation.—Assistant Engineer.
Complaint.—Hiccough, inability to pass urine.
Family History.—Nil.
Previous History.—About 3 months back, patient had pain in the knee joint lasting for about 4 months. He had slight swelling of feet and breathlessness on exertion.
History of Present Illness.—On Saturday, 12th July 1930, patient had an attack of diarrhoea. He passed 30 loose watery motions that day. He was admitted in the Isolation Hospital where his condition is said to have been diagnosed as cholera. He was given intravenous saline. Vomited twice. Since Sunday last he has not passed urine. Hiccough began two days back and has continued since.
Physical Examination.—An ill-nourished man of about 52 years, slightly anaemic, teeth dirty, P. A. present, tongue dry, thickly coated with a white fur, appetite poor.
Circulatory System.—Heart size normal, Heart sounds feeble.
Respiratory System.—Respiratory sounds harsh all over.
Alimentary System.—Liver and Spleen not enlarged. Tenderness present about umbilical region.
Investigation.—
Urine.—1020, Alkaline, Sugar nil, Albumin nil. Epithelial and granular casts and later motile bacilli present.
Motion.—No ova.
Blood Urea.—See chart.
Blood Chlorides.—320 mgms. % as NaCl.
Blood Phosphates.—6.3 mgms. %
Blood Creatinine.—34.2 mgms. per 100 c.c.
Urine Culture.—B Coli grown.
C. S. F.—
(a) Chloride Content.—300 mgms. as NaCl per 100 c.c.
(b) Albumin.—43.6 mgms. per 100 c.c.
(c) Globulin.—30.6 mgms. per 100 c.c.
(d) Urea.—291 mgms. %
(e) Sugar.—0.058 %



Notes.—Mr. Venkatesh Iyer, a case of M. L. Age.—32 years. Disease.—Post choleraic acute uraemia. Note.—The straight line part of Blood urea curve shows that the rate of diminution of Blood urea is constant and not variable.

W. R.—Negative.

Hb.—90 %

Blood pressure 18th July—120/30.

6th July—120/85.

1st Aug.—115/80.

5th Aug.—115/75.

Blood.—No parasite.

Treatment.

Rx

Sod. Bromide gr. 45.
Tr. Belladonna Mxxx.
Ac. Hydrocyanic dil Mxv.
Tr. Hyoscyamus half a drachm.
Pot-citras one drachm.
Sod. Bizarb one drachm.
Aqua chloroform ad six ounces.
One ounce every 4 hours.

Rx

Lq. Trinitrine Mi.
Spts. Aetheris Mxx.
Spts. Chloroform Mxx.
Tr. Lavendulae z. ss.
Tr. card co. ad. z. i.
One ounce to be taken in one ounce of water every 4 hours.

Rx

Mist. alba one ounce every morning.
Atropine 1/100 gra.
Mag. Sulph Enema 25% solution daily.

30th July.—

Rx

Sod. Nitrite gr. ii.
Sod. Nitrates gr. v.
Ext. glyc. liq. Mx.
Spts. Chloroform Mx.
Aqua Ad. one ounce.
One ounce every 4 hours.
Agar agar one teaspoonful at bed-time.
Blister on phrenic nerve area in neck.
Blister epigastrium.
Stomach Wash.

14th Aug.—

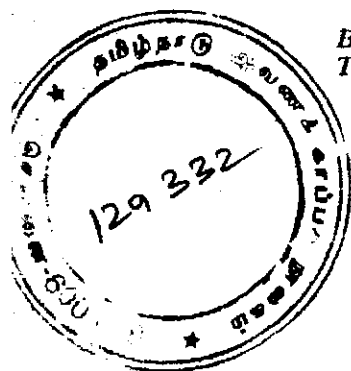
Rx

Mist. Acid Tonic three ounces.
One ounce t. d. s. ; p. c.
Scarlet Red ointment for extl. use only for bed sore.
Water bed.

The patient had to be catheterised every day during the earlier part of his stay in the hospital but later he began to pass urine himself. Constipation was rather obstinate for some time and had to be got rid off by means of the usual remedies. Hiccough continued very persistently and some days after the admission began to be worse at night. Temperature came down to normal some days after the admission and continued so. The most interesting part of the observation was, the diminution in blood urea and blood Indican during the course of treatment. The blood urea curve apart from showing the continual diminution in the percentage of blood urea indicates that at least for some days, the rate of diminution was constant as is evidenced by the straightness of the resulting graph (i.e., from 28-7-30 to 20-8-30.)

The patient gradually recovered and was discharged cured on 21-8-30.

My thanks are due to Lt. Col. G. E. Malcomson, M.D., M.R.C.P., I.M.S., for his kindness in permitting me to report this case.



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