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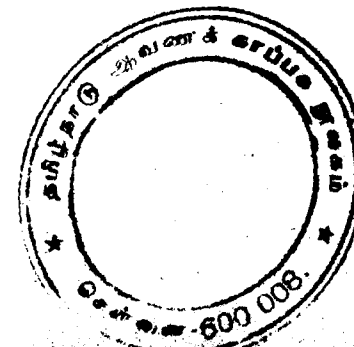
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The

Madras Medical Journal

The Journal of the Madras Medical Association.

PUBLISHED QUARTERLY.

Vol. XVI.

April 1936.

Nos. 1 & 2.

Foreword.

The Madras Medical Journal has been in existence for over fifteen years and one must regret the fact that it has had a chequered career in the past. It is proposed to rejuvenate it hereafter and it is the hope of the Editor and the Editorial staff that the Journal would hereafter be so conducted as to serve the objects the originators had in view and fill a very necessary place among the journals in this country.

The Journal is the mouthpiece of the Madras Medical Association and as one intimately associated with the fortunes of this association, its ups and downs from its small beginnings in 1914, may I appeal to all my colleagues in the service to enthusiastically support the central organisation which has striven, through good report and bad, through criticism and comment, to uphold the highest interests of the medical profession and protect the just aspirations of its members.

The Journal should command a warm corner in every member and I join in the appeal of the Editor and the Editorial board in earnestly requesting one and all to extend their hearty support and make the journal worthy of the traditions of the service reflecting the good work that the members of the service are privileged to carry on. To the medical profession in general we extend a cordial invitation to contribute to the Journal articles of scientific interest.

The journal will strive its best to serve the cause of a noble profession and to uphold its best traditions and may its task be made easy by the willing co-operation of one and all.

A. L. MUDALIAR,

President, Madras Medical Association.

Rambles in the West*

By

EBENEZER MADURAM, M.B.B.S., F.R.C.S.(F.), M.C.O.G.

Introduction.—I am afraid my talk this evening is going to be very different from the usual learned lectures on classical subjects in Obstetrics or Gynaecology delivered here and the discussions that follow. It is going to be in the nature of a variety entertainment and I crave the indulgence of the serious and classical minded for an hour.

Being asked to give lectures seems to be one of the penalties imposed on people who go abroad. If this fact had been sufficiently borne in on me before I went out, I might have gone about collecting information deliberately from the platform speaker's point of view; unfortunately I have been caught unawares after my return, and you must excuse me if my information is rather vague on certain subjects.

I am hoping to devote a good bit of my time this afternoon to tell you something about hospitals in the United States of America, to which country I paid a flying visit before I returned to India. To justify, however, the greater part of my leave period spent in Great Britain, I will spend the first few minutes in telling you of the kinds of thought that are engaging the attention of the leading Gynaecologists and Obstetricians of Great

Britain at the present moment, and to tell you of a few things of practical importance that I picked up during the very short time I devoted to brushing up and bringing up-to-date my knowledge of Obstetrics and Gynaecology. I am very keenly aware of the fact that it would be presumption on my part to tell some eminent people here of up-to-date methods, and I hope they will excuse me if I talk to the members here, who like myself, find it difficult to keep abreast of the times in more subjects than one, and who would like to glean latest information through the medium of lectures afforded by societies such as this rather than through elaborate literature.

A few practical hints in Obstetrical Practice.—The latest antiseptic that is popular largely in obstetric, and to a small extent in gynaecological practice is *Dettol*.*

It is the only antiseptic used for disinfection of the vulva, vagina and the obstetrician's hands in Queen Charlotte's Maternity Hospital London. I would like to read to you the type-written sheet that is framed and put up in the delivery ward of Queen Charlotte's Maternity Hospital.

* Lecture delivered before the Obstetric and Gynaecological Society of Southern India on 30th August 1935.

* *Dettol* is a halogen derivative of Xylenol dissolved in a saponified mixture of aromatic oils. It is used as a non-toxic and non-irritant germicide. (Reckitt & Sons, Hull).—Ed.

Rambles in the West

3

"ANTISEPTIC PRACTICE FOR THE LABOUR WARDS

AND

LYING-IN WARDS.

(1) *Washing vulva and perineum.*—Dettol 10 per cent with 1 per cent soft soap to be diluted with oz. 1 to oz. x of hot water and used for swabbing down vulva.

(2) After washing, swab thoroughly with 30 per cent Dettol Cream. No examination to be made for at least 5 minutes after application of Dettol unless required for special circumstances, such as haemorrhage.

(3) *Hands.*—To be washed and dried. Unsterilised, dry gloves to be put on, washed and then sterilised on the hands by rubbing all over (up to the wrist) for 2 minutes with 30 per cent Dettol Cream. This sterilisation must be repeated before each P.V. and after every possible contamination.

Gloves to be carefully washed free of Dettol on removal from the hands, otherwise they will quickly perish.

(4) As lubricant for hands or vulva 30 per cent Dettol Cream to be used.

(5) Dettol 10 per cent with soft soap diluted with oz. 1 to oz. x of hot water to be used for swabbing down the vulva during the puerperium. Masks to be worn while this is done but not gloves.

N.B.—Dettol is expensive and should therefore be used economically. Brushes are not to be put into Dettol but Carbolic 1-20."

Dettol is said to be bland and non irritating, non-poisonous and non staining to tissues and linen. Another advantage is that it is

readily miscible with water in all proportions. I have also seen some leading Gynaecologists in London hospitals using Dettol for disinfection of vulva and perineum for all operations on the vagina and perineum.

For *primary Uterine Inertia*:—During the second stage of labour injection of *acetyl-choline* is being used with success. At Queen Charlotte's Hospital 0.2 grm. of acetyl-choline is given intramuscularly, and repeated second hourly for 3 doses when the second stage is protracted due to uterine inertia. This has largely taken the place of Quinine administration in the second stage.

Acetyl-choline is very much used in surgical practice too in Great Britain to stimulate the plain muscle fibres of the intestines in cases of paralytic ileus, and in the post-operative stimulation of the gut after surgical relief of the obstructing factor in intestinal obstruction. Here 2 c.c. ampoule is given intramuscularly, or even intravenously in desperate cases and repeated every hour. The rationale of the treatment is based on the fact that bile preparations have the power of stimulating the plain muscle fibres of the intestinal tract, the principle has long been recognised and made use of in the administration of ox-bile enema for intestinal stasis of all kinds. It has now been recognised that bile preparations have the power of stimulating the plain muscular fibres of the uterus also, and this recognition has led to the use of the drug for stimulation of uterine contractions in primary uterine inertia.

A simple method of *relaxation of retraction ring of Bandl and the local contraction ring* which is an annular constriction of the lower part of the uterus which grasps the child, usually round its neck and prevents the passage of the shoulders:—We are all familiar with the difficulty offered by these two forms of ring in cases where the membranes have been ruptured some hours, in the presence of some mechanical difficulty in labour, especially if the uterus had been previously irritated by unsuccessful attempts at delivery and of the great danger of rupture of the uterus even when the patient is deeply under the influence of a general anaesthetic with the aid of morphia and atropine to aid the relaxation.

Now the simple remedy which is said to act like magic in the relaxation of these rings is the inhalation of *amyl nitrite capsules*. I need hardly explain the method of action of this drug, it is too well known. It acts in the same way as in *angina pectoris*. 2 or 3 capsules of amyl nitrite broken by the anaesthetist into the mask of the anaesthesia and inhaled by the patient is said to bring about a rapid and remarkable relaxation of the spasm of the circular muscle fibres of the uterus. It is said to be successful in 80 per cent of cases. For the remaining 20 per cent other methods of treatment such as continuous traction with Willet's Forceps or Lower Segment Caesarean Section, with or without removal of the infected uterus are advocated.

Anaesthesia in Labour—(What is popularly known among lay people as "painless labour") is one of the

important problems that is engaging the attention of all the leading obstetricians of the day in the Western countries, as the women of the West are demanding more and more of the medical profession, freedom from pain during childbirth, and especially as the dread of labour pains has been said to be one of the contributory factors of a falling birth-rate. (I have heard it mentioned more than once, but I cannot vouch for its accuracy, that there has been an increase in the birth-rate since the adoption of the administration of a general anaesthetic during the second stage of labour in almost all the leading Maternity Institutions of the West).

Queen Charlotte's Hospital was trying two years ago, chloroform capsules and brisettes for all normal cases, but now they use universally gas and oxygen anaesthesia during the second stage. There are two full-time women anaesthetists who are on duty on alternate days, and are sent for by the staff nurse of the delivery room as soon as the patient commences the second stage pains. Most of you must be familiar with the articles and discussions in all the leading journals on the methods and various simple apparatus, such as Christie Brown's inhaler, etc., devised for the use of anaesthesia by midwives in domiciliary practice.

Apart from the chloral and bromide, morphia and scopolomine analgesia in the first stage, a number of barbiturate drugs are also used in the first stage such as pernocton, sodium amytal, nembutal, etc. For the second stage, the most favourite forms of anaesthesia

besides chloroform and ether are gas and oxygen, rectal anaesthesia with avertin or olive oil and ether. In America ethylene and oxygen is the most favourite combination for anaesthesia during labour. Spinal anaesthesia for Caesarean section is becoming increasingly popular because it is said to bring about excellent uterine contraction, with surprisingly small amount of haemorrhage, and with no ill effects on the child.

Before I dismiss the subject of painless labour and the allied one of anaesthesia in labour, I would like to provoke the question—*"why should not the same facilities for alleviation of suffering during labour be available for our Indian women?"* The time is past when it was thought it was woman's sphere to suffer, that it was the expiation of the curse pronounced on woman in the garden of Eden. Even in our country women no longer take the fatalistic attitude that they used to take with regard to the pangs of labour. More and more of the better class women request their medical attendants to give them the assurance of painless labour while many more who cannot command such relief live for 10 months in the dread of the ordeal to come. And it is up to us medical men and women in general, and for the chief medical officers of maternity institutions in particular to consider and take up this subject seriously. It does mean closer supervision of the cases by doctors, and it does mean more staff for the administration of anaesthesia but in these days of progress it is not impossible to surmount such trivial obstacles.

Asphyxia Neonatorum.—The method of dealing with asphyxiated new born babies has undergone a radical change in recent years. No longer is the child rolled about, slapped, swung about or squeezed and mauled under the impression that it is being given artificial respiration. We knew that these crude methods increase the shock to the child, but we carried on the same routine for want of anything better to take its place. The modern method, however, is to keep the child as quiet as possible and warm. No other handling is permitted than sucking out the mucus from the throat, and the physiological principle of stimulating respiration, without any disturbance to the child, is carried out by the administration by means of a mask of 6 per cent CO₂ in oxygen. The gas is released from the cylinder at just sufficient pressure to force the mixture up the respiratory passages and to gently inflate the alveoli, as well as to bring about sufficient CO₂ concentration in the blood to provide a strong stimulus to the respiratory centre. The oldest and simplest method of applying this principle is by mouth to mouth insufflation of the lungs. The dangers of this crude method are: (i) too great a force in blowing may rupture alveoli of the lung; (ii) infection of the air passages from the mouth of the obstetrician; (iii) unless care is taken to apply pressure to the epigastrium the insufflated air is liable to pass into the stomach and not into the lungs.

There are two drugs now specifically used for reviving asphyxiated children. One is a preparation of camphor called "*coramine*" to

rapidly stimulate the heart and circulation in cases where the heart's action is not strong; and in cases where the heart is beating vigorously but where the respiratory centre is failing to respond to even CO₂, the injection of *alpha lobelin* into the umbilical vein—R. A. Wilson in the American Journal of Obstetrics and Gynaecology, 1928, has recommended the use of this drug in 1/40—1/20 gr. doses and has noted the rapid onset of deep breathing in 7-15 seconds after the injection.

In passing, I would just like to add that the condition of "Foetal Shock", formerly called "white asphyxia" which occurs in cases of difficult and rapid breech extraction, difficult and high forceps deliveries through a relatively contracted pelvis is now proved to be due to intracranial haemorrhage and tentorial tears, due to sudden and extreme compression in one diameter and the consequent overstretching of the cranial bones and intracranial septa in another diameter. This fact was first stressed by Eardley Holland in his "Report on the Causes of Foetal Mortality" to the Ministry of Health in Great Britain, and has since been proved by many other observers who did *post-mortem* examinations on babies that were still born or died of white asphyxia. Even in those babies that survived the cerebro-spinal fluid is blood-stained, bearing out the fact that the causes of foetal shock are intracranial injury, laceration and haemorrhage, and not pressure on the cord, compression or premature separation of placenta or premature attempt at respiration as was formerly supposed.

A very vexed question which is very much discussed in England at the present moment is why the almost universal adoption of antenatal care within the last 15 years has not materially diminished the maternal mortality rate. In 1920 it was 4 per thousand and it still remains the same, while some countries in Europe have managed to reduce their figure to 2 per thousand. The Ministry of Health is agitated and looks to the medical profession for a solution of the problem, and the medical profession in trying to find a scapegoat condemns the general practitioner, the inefficiency of teaching in the medical schools, the pelvimeter and so forth. It was one of the vital subjects discussed by the Public Health section in the British Medical Association Conference held in Bournemouth, July 1934, at which I was present. Health officers of all the important cities had to admit that in spite of efficient organisation of antenatal clinics the maternal mortality rate remained unaltered. The only tangible good, they all admitted, that efficient antenatal supervision had accomplished was the reduction of pregnancy toxæmia, eclampsia, etc. I cannot go into all the technical explanation they went into, but there was one factor which was more or less accepted as responsible in a large measure to the failure, and I pass it on to you, as it may be of help to some of you who are also tackling the same problem, and that is, that there was too much meddling with the cases unnecessarily, too much "induction of labour" for even mild cases of toxæmia and mild cases of contracted pelvis, with the result

that a large number contracted puerperal sepsis, which was still the factor responsible for the greatest number of maternal deaths, in spite of early recognition of the haemolytic streptococcus, segregation and compulsory notification. As one speaker aptly expressed it "Antenatal care was simply transferring the mortality number from one column to another."

Later, when I came to work in some of the London Hospitals I came to recognise that this criticism was no exaggeration, for there was not a day when one or more cases were not having artificial induction of labour practised on. I saw quite a number of cases "induced" at the 36th or 38th week for moderate degrees of contracted pelvis who delivered with surprising ease within 6 or 8 hours of the onset of labour pains, with little or no moulding of the head. Left alone to full term they might have taken a few more hours, but with "moulding" they would have delivered naturally or at the most needed only "low forceps". Similarly, I found that cases of even mild toxæmia were given only 3 or 4 days of treatment, and if the oedema, albuminuria, blood pressure, etc., did not clear up within that brief period "induction of labour" was practised. I do not think that this criticism is applicable to us, for in the Madras Schools of Obstetrics I do not think "artificial induction of labour" is practised in anything like the same extent as it is in the West. In the Government Victoria Caste and Gosha Hospital induction of labour is an extremely rare event.

Gynaecology.—The two diseases very much talked of at the present

moment are Endometrioma and Metropathia Haemorrhagica.

The former—*Endometrioma*—is, like Eclampsia, still a disease of theories, but there is only one line of treatment to it and that is operation. As I have promised not to delve into theories but keep to practical points I shall pass on to the other disease for which a new drug is on the market and being used largely in all the Gynaecological Hospitals of London.

Metropathia Haemorrhagica is, as you are well aware, the new name given to an old disease. If used to be originally called "chronic metritis", and later came to be known as "fibrosis uteri" and was thought to be a condition of chronic subinvolution. When a disease changes its name often it means that its pathology and causation are not correctly understood, but I think the name *metropathia haemorrhagica* has come to stay for the recent discoveries in Female Endocrinology which brought to light the inter-actions between the two ovarian hormones and the two secretions of the anterior pituitary gland have thrown a great deal of light on the pathology and oetiology of this disease which is commonly met with in multiparae about the age of 40, and which manifests itself by uncontrollable bleeding for 6 to 8 weeks after a short period of amenorrhoea.

I am not going to enter fully into the causation of metropathia haemorrhagica but it is necessary for me to say a few words to introduce the new Hormone drug which is being used for this disease. You are aware of the two

ovarian secretions controlling the menstrual cycles, the *Follicular Hormone* or *Oestrin* bringing about the premenstrual glandular hyperplasia and the onset of menstruation, and the *Luteal Hormone* or *Progestin* which opposes menstruation, helps to terminate the menstrual bleeding and the continuance of pregnancy should the ovum become fertilised. You are also aware that it has been conclusively proved that the regulation of this periodic cycle of ovarian activity ultimately rests with the anterior pituitary gland, which it does by means of its two secretions—one promoting follicular maturation known as *Prolan A* and the other stimulating luteinisation of the ovarian follicle known as *Prolan B*.

In metropathia haemorrhagica the graafian follicle matures and contains an excess of oestrin. There are also one or two follicular cysts containing more oestrin, but for want of the luteinising hormone from the anterior pituitary the follicle fails to rupture and there is failure of corpus luteum formation, and the endometrium undergoes glandular hyperplasia under the excessive stimulus of the oestrin, and when menstruation occurs there is excessive and uncontrollable bleeding for some weeks, often quite uninfluenced by curetting. The ovary in these cases contains follicular cysts but no corpus luteum, and the knowledge that the absence of corpus luteum in the ovary is due to the failure of the luteinising hormone of the anterior pituitary gland has led to the use of a preparation now on the market known as *Antuitrin-S*, (Parke Davis) which is supposed to contain

this specific luteinising hormone. Cases resisting curettage formerly treated by radium or X-rays, or even hysterectomy are now treated with *Antuitrin-S* with surprisingly good results. 1 c. c. injections of Parke Davis' *Antuitrin-S* twice a day for 3 days (6 doses in all) are given. Each c. c. of the drug contains 100 rat units, which is supposed to promote the formation of one or more corpora lutea in the ovaries of the rats in 90—100 hours of administration.

I would also like to add, in this connection for the benefit of those who are despondent in handling patients suffering from *repeated abortions*, who have no organic or specific disease of any kind, and in whom even Vitamin-B preparations have failed, that this new drug *Antuitrin-S* is being largely used for these cases. Although it is too soon to say with what results, in principle at any rate the treatment seems sound, for we know that the corpus luteal hormone is chiefly responsible for the firm nidation of the ovum *in utero*, and the continuation of pregnancy. Hence an anterior pituitary secretion which promotes the formation of healthy corpus luteum in the ovary must be of benefit in cases of repeated abortions for which no other cause can be assigned.

In conclusion, I would just like to mention that the opposite oestrin containing hormone is being used for premature termination of pregnancy, even as a means of medical induction of labour for cases of post-maturity, pelvic disproportion, etc. The only drawback about its universal adoption is its expense as

about a million mouse units are said to be required for the purpose.

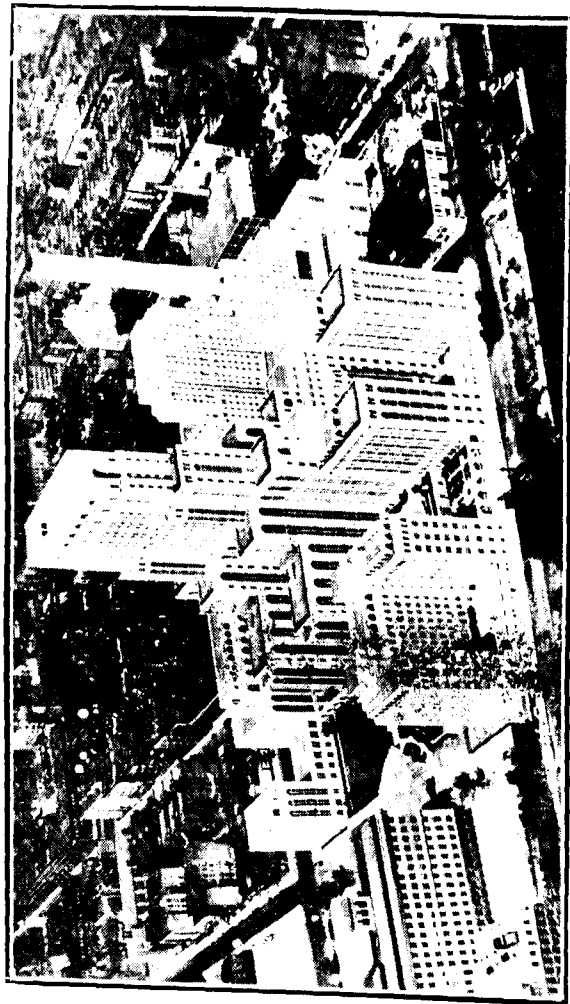
Hospitals in the United States of America.

I wish to devote the rest of my time to give you a short account of my impressions about hospitals in United States of America. You must not expect any detailed remarks, as I spent only 5 weeks in that great country (exclusive of the time spent on voyage to and fro), and when one had to crowd in sight-seeing as well as hospital visiting in that short space of time, you will understand that impressions can only be superficial. But there is something stimulating about the air of New York that one can go about all day doing things without getting over fatigued. For most people the day consists of hours from 7 A.M. till 12 midnight, and as I had some friend or other taking charge of me everyday and hustling me around till midnight I was able to fit in quite a number of things within that short time. I was able to visit almost all the important hospitals in New York and hospitals in some of the other cities because of the letters of introduction I had from the Assistant Director of the Rockefeller Medical Institute, New York, to whom I was taken by the Lady Secretary of a branch of the Y. W. C. A. work known as "Committee for Friendly Relations among Foreign Students". To the assistant-Director of the Rockefeller Foundation I stated my desire to see chiefly surgical work but also something of the Obstetrical and Gynaecological units in the American hospitals. As a result of his

letters of introduction I was very courteously received everywhere and every facility was afforded to me to see the maximum of work possible in the little time I had at my disposal.

The first thing that strikes even the most casual visitor to New York about the hospitals is the lavish scale on which the buildings are erected, which of course is in keeping with the rest of the massive and sky-scraper buildings of the city. To give you an idea of the latest, I would like to project on the screen picture post cards of the New Medical centre of the Columbia University, which is about 7 years old, and the Cornell Medical Institute or College and the attached New York Hospital which is about 3 or 4 years old, built just before the great financial depression. The former is a building 17 storeys high and is formed by the coalition of several units, about 11 or 12, such as the Sloane Maternity Hospital, the New York Neurological Institute, the Presbyterian Hospital with the medical and surgical units, etc. The New York Hospital is 24 storeys high. I was taken to the top floor and given a bird's eye view of New York City with its sky scrapers. I am sure it will fill some of us with envy to see the magnificent block where the nurses of this institution are housed, and compare it with the ramshackle buildings that most of our nurses are expected to live in.

The interior is proportioned and equipped on an equally lavish scale. There is a place or room for every imaginable purpose you can think of, most maternity hospitals have even a special waiting



Aerial View of New York Hospital.

room fitted with comfortable sofas for husbands to stay in and get their suspense alleviated while their wives are undergoing the pangs of labour! Every doctor attached to the staff of a hospital has an office room, each senior doctor has a lady secretary who attends to all his correspondence, makes all his appointments, files all his records and compiles all his statistics. Each of these secretaries has an office room of her own and is quite an important personage. All the major antenatal clinics have a fluoroscopic screening room to recognise abnormalities in position and lie of the foetus, so also every fracture setting room is fitted up with a fluoroscopic apparatus. All the modern hospitals have a "solarium" in every floor so that convalescent patients could be wheeled on to them. Every teaching institution has also a huge amphitheatre where special clinics are held with provision for cinema demonstration among other facilities for teaching. I think I have said enough to make you understand the almost luxurious way in which these hospitals are equipped.

One of the hospitals I visited early was the Women's Hospital in 109th Street, New York, commonly called the "Birthplace of Gynaecology," founded originally by the Father of Modern Gynaecology Marion Simms, he of the Duckhill speculum and uterine sound. The head of this institution now is Dr. Gray Ward familiar to most of you from his constant supply in the medical journals of statistics for the radium treatment of carcinoma cervix. I had the opportunity to attend one of his cancer clinics,

besides showing me his radium containers, etc., he took me all over the hospital, and with special pride he showed me the museum where the original vaginal speculum and other instruments devised and used by Simms, are kept, as also his book of gynaecology with the diagrams of steps of the vaginal operations drawn with his own hand. As a souvenir of my visit to the hospital Dr. Gray Ward then presented me with an autographed copy of the Report on the working of the hospital, with statistics and articles of original research done by him and his staff. So great is the courtesy shown by American doctors to visitors to their country that this great man took me in his car, after that morning's work was over, to the New York Academy of Medicine, showed me all over it and finally arranged with the secretary of the Academy that every morning I would receive, by the first post, a list of all the operations, lectures and conferences held in each of the hospitals in New York collected and published by the Academy the previous evening. This list was of great use to me as long as I stayed in New York in selecting each day the hospitals I wanted to attend.

The first post arrived at 7.30 A.M. and as the operations in all the hospitals commenced at 8 A.M. and as the restaurants which keep late hours do not open so early I had to resort to the nearest Drug Store most mornings to have a light breakfast. Most of us are aware of the diversity of things one can purchase at a chemist's shop in England, but serving breakfasts no a counter is one of the specialities of Drug Stores in New York; they

are open all night and so fill this great need for all those who start work very early.

Mention of the early commencement of work at 8 A.M. in all the hospitals in the United States, brings me to the subject of hospital administration, which more or less resembles our system in that most of the doctors are salaried men attached to a particular hospital and do full time work in that one institution only. In that way their system differs from the visiting and honorary system which obtains in England, where each Surgeon, Physician or Obstetrician gives his services to a different hospital on different days of the week. Surgery in America is very highly advanced and the fact that many new methods of surgical treatment originate from that country proves the fact that the American surgeons are much more enterprising and do not work on such conservative lines as the British surgeons do. Facilities for research work abound in every hospital and clinic and practically every member of the staff is engaged on some original experiment or other of his own.

Anaesthesia is a highly specialised profession, and the apparatus used in most hospitals is a very complicated one, more complicated machines for gas, O₂, CO₂, Ethylene, etc., are used than in Great Britain. Here I must mention an unusual feature which struck me, and that was that anaesthesia in all American hospitals is administered by specially trained and certified nurses. They are so highly trained for this science that they keep an elaborate chart during the operation,

consisting of a record every few minutes of pulse, respiration, blood pressure, etc., and they also put it up on a small black board by their side so that the surgeon, in prolonged operations, has only to glance at this to know what the patient's condition is like at any stage of the operation. Apart from general local and spinal anaesthesia rectal anaesthesia with avertin is just now greatly in vogue in New York hospitals. I even witnessed a brain tumour removed under rectal avertin anaesthesia.

Every theatre in every hospital I had been in had the electric suction apparatus working, so that the work of the assistant was reduced to retracting and cutting of sutures and ligatures, the duty of wiping and keeping the field of operation clean was entrusted entirely to the suction tube. In the University Hospital in Chicago where I witnessed a Caesarean section the Surgeon made a tiny puncture into the sac of the membrane and inserted the suction tube which sucked up the liquor amnii in no time, the blood also, so that there was very little of the mess that one usually witnesses during a Caesarean section.

I shall now refrain from saying anything more about the professional side and mention one or two more of the unique features that I met with in American hospitals.

Social Service.—In every hospital that I have been in the United States of America they have a highly specialised department called the Social Service Department as an integral part of the equipment of the hospital, consisting of a diet

specialist and various other workers, as well as trained nurses. It is their duty to study the social status of each patient while in hospital, what his financial position is, what kind of house he lives in, what food he and his family have, what other members of the family suffer from the same or allied diseases, by visiting his home. They then assist the physician or surgeon in his treatment of the disease. The same interest is also kept up in the patient during his convalescent period after he is discharged from the hospital we knew that dietetics is a subject much more studied and understood in America than in England, and they bring the knowledge to bear in the treatment of diseases in hospitals.

There was another feature which I noted as a more or less universal practice in hospitals in the United States and that was the holding of *Staff Conferences* once a week. I was present at two such conferences, one at the Women's Hospital, New York, and the other at the Mayo Clinic. Every member of the staff, senior and junior is expected to be present, and each member reports on all cases of unusual interest, which has come under his observation during the week. These conferences vary in detail, in some each member not only reports on unusual cases, but all kinds of happening—such as all cases of deaths, cases of sepsis, puerperal or post operative, if surgical, mistakes in diagnosis, mistakes in operations—and a general discussion ensues, not in a critical way but with a constructive view that further light may be thrown in obscure cases. The pathologist is there to give his special report and

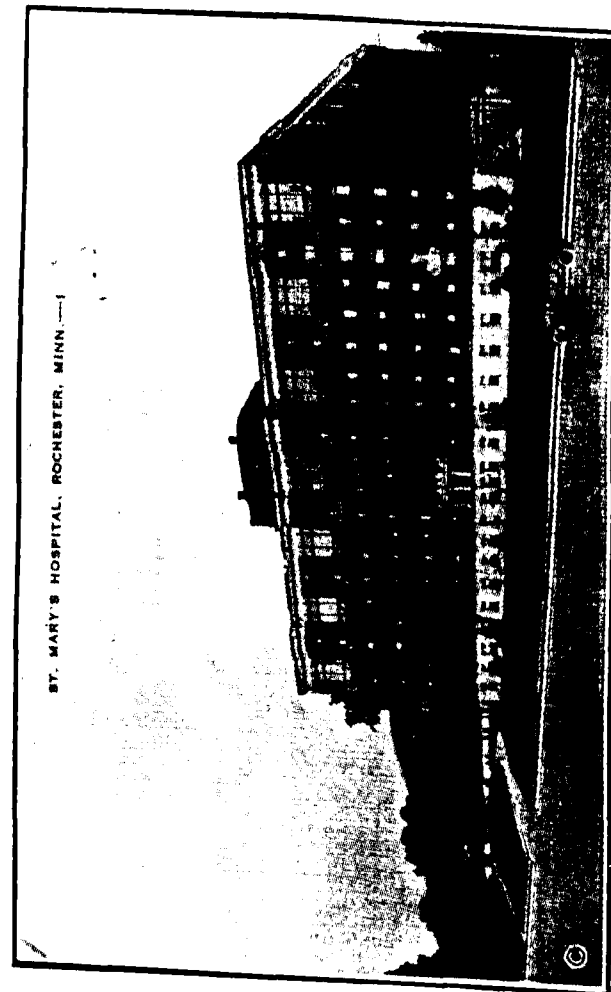
opinion, the radiologist is there to interpret the radiograms of the case in question and so on. It seemed to me that such conferences not only brought together all the members of the hospital staff once a week, but also gave a stimulus to study and understand the obscure cases. In the Mayo Clinic the task of presenting the unusual cases of the week is entrusted to the junior staff, so that they may get into the way of getting up and talking before an assembly, the senior ones only taking part in the discussion that ensues.

The Mayo Clinic.

I had the good fortune to spend 5 days at the world famous clinic run by the two Mayo brothers Dr. William and Dr. Charles Mayo—at present 72 and 68 years old respectively. The clinic is in the town of Rochester, in the State of Minnesota. It is a marvellous example of perfect organisation and efficient administration of surgical relief, entirely run by private enterprise. The magnitude of the institution and its work can be conceived when I give you some figures relating to the institution. About 70,000 to 100,000 patients are said to pass through the clinic per annum. There are 175 senior doctors on the permanent staff, and 200 on the temporary staff. These latter are called fellows, and selected from A class medical graduates from the American Universities, who do a period of 3 years internship, working in the various departments of their special subject and who after the 3 years are allowed to sit for the Degree of Master of Surgery in the University of Minnesota in Minneapolis. A certain number of seats for this



The Mayo Clinic, Rochester Minnesota, U. S. A.



St. Mary's Hospital, Rochester, Minn.—which is attached to the Mayo Clinic, and where the greater part of the surgical work of the clinic is carried out.

internship are reserved for other countries—Canada, Great Britain, Germany, France, etc., and one seat is reserved for India. This last is at present held by one Dr. Naidu from Mysore University. Besides these there are always dozens of visiting doctors from all parts of the world, who are given every facility for witnessing the work in the subjects they are specially interested in.

The new clinic building is a 17-storeyed building, and is mainly a diagnostic centre. Every train and every automobile coming into Rochester brings ailing humanity into the clinic, the town is also connected by air service with all the large cities in United States of America. As soon as the patient arrives he or she registers at the main desk and is then referred by the Secretary there to the various special diagnostic desks in the different floors. There are desks for every conceivable branch of medicine, surgery, obstetrics and gynaecology, with specialists attached to them. The first 3 days the patient is handed from one desk to another with various requisition cards and on the third day the surgeon originally in charge of the case forms his diagnosis with all the data before him and decides what form the surgical treatment is going to take. When he has decided that, or for observation purposes if it is an obscure one, the patient is given the card for admission into one or other of the various hospitals according to his or her ailments.

There are 3 main hospitals into which the patients are admitted,

all of which are otherwise unconnected with Mayo Clinic. St. Mary's Hospital, the largest one in the town is a Roman Catholic Institution. It has been growing in size ever since to meet the growing demands of the clinic; the latest addition to the surgical units was made in 1922; at present the hospital contains 1,600 beds; it has the largest surgical unit in the United States. The new block contains 11 modern operating theatres with galleries for visitors. Each surgeon operates of a morning or afternoon with two sets of theatres and a whole posse of assistants; when he is operating in No. 2 theatre, No. 1 theatre is being got ready for the third operation and so on; when there is a long programme the surgeon leaves the "closing up" process to the assistants and starts the next operation. It is a marvellous example of team work and it is only by such means that they are also to get through such a large number of cases each day.

The hospital next in size is the *Colonial Hospital* which has 235 beds. It accommodates all genito-urinary and rectal cases, and also a number of operating theatres. The *Worrall Hospital* has 125 beds and is specially designed for eye, ear, nose and throat cases. Besides these a number of large hotels all round the clinic also have set apart one or two of their floors for certain diagnostic desks for which there is not sufficient room in the main clinic building. The largest of these is the Kabler Hotel. All these hotels take in patients from all parts of the world and they are all connected by beautiful subways with polished glazed walls and tiled

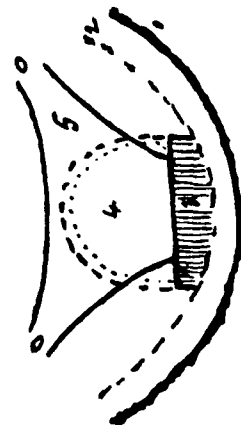
floors with the clinic, so that patients wheeled on chairs and trolley could be taken up or down by elevators to the clinic or to their bedrooms in the hotel without having to be brought to the Street level. Hotels and boarding houses all cater to the patients of the clinic and apart from these and the houses of the doctors there is nothing else of importance in the town of Rochester. The whole town is subservient to the clinic.

Rochester is supposed to contain more than a thousand trained nurses working in these various hospitals there are about a 100 office girls working in the clinic alone in the business section where bills are drawn up, in the registration department, record rooms, telephone, electric control, etc. There are numbers of electric machines in the recording and registration rooms for sorting out records, and filing them, also for shooting them into tubes and getting them carried from the clinic to the various hospitals in a few seconds or one or two minutes

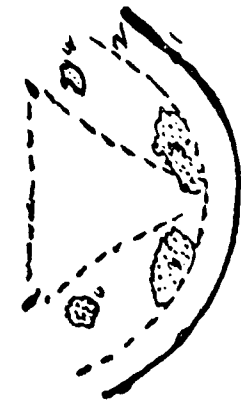
according to the distance. The elaborate system of electric switch board and signals from one floor to another by which each floor keeps track of where a particular surgeon or specialist is at a given moment is more than I can outline in detail. The women in charge of these electrical signal system tried to explain the working of it, but my brain was in a whirl. One must live there several months before one can exhaust and understand all the marvels of that place, and if anyone wishes to be surfeited with surgery, in all its manifold forms, the Mayo Clinic is the place to go to.

To promote research the clinic runs an experimental farm 3 miles outside the town where all kinds of animals—monkeys, dogs, guineapigs, fowls, rats, mice, etc., are reared, and where some research workers live and carry on their experiments. They get all their pathological materials from the clinic. Zondek—Aschiem tests, inoculation of tubercular specimens into guineapigs, etc., are all done here.

Diagram to interpret Pneumo-cystogram.

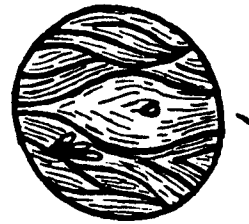


1. Outline of symphysis and bony brim.
2. Outline of air distended bladder.
3. Shadow of bar.
4. Outline of shadow of enlarged middle lobe.
5. Outline of trigone when hypertrophied.

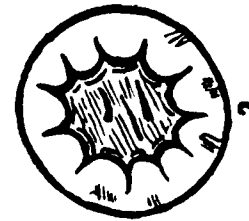


1. Outline of bony brim.
2. Outline of air distended bladder.
- 3-4. Malignant growths as papilloma.
- 4-5. Non-malignant growths as papilloma.

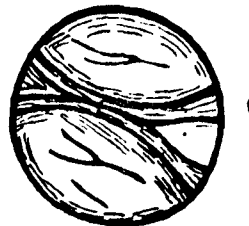
Diagramatic Views through an Antigrade Posterior Urethroscope.



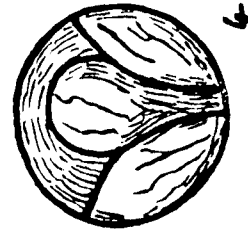
1. Floor of posterior urethra with upper part of Verumontanum and a small papilloma.



2. Normal view of vesical outlet from urethral aspect.



3. Enlarged prostatic lobes and upper part of verumontanum.



4. Enlarged prostatic lobes with a middle lobe.

Visualisation of the Urinary Tract for Diagnosis *

By N. MANGESH RAO, M.B.C.M., F.R.C.S.E

It is necessary to visualise the urinary tract to clinch the diagnosis. This may be done by direct methods with the help of special instruments as the urethroscope and cystoscope or indirect methods with the help of X-rays.

For this purpose the urinary tract may be divided into two parts, the upper and the lower, the upper one consisting of kidneys and ureter and the lower consisting of the bladder and urethra.

VISUALISATION OF THE UPPER URINARY TRACT.

The upper part has to be visualised only by indirect methods in which the co-operation of an expert roentgenologist is necessary. Occasionally it may become necessary to examine the kidneys by direct vision after exposing the organ.

Prior to the advances made in roentgenology, diagnosis of diseases of this part of the tract were very poor. It is now possible to make a fairly correct diagnosis of surgical lesions of upper urinary tract. The introduction of organic iodine compounds with a selective affinity for the kidneys without causing any damage to the body organism or the urinary tract has been of the

greatest advantage to the Urologist in his diagnosis.

For taking radiogram it is essential that the intestinal tract should be emptied of foreign material and gas. It is advisable to give the patient a good laxative two days prior to the examination and place him on a non-gas forming soft diet on the previous day. Fluid intake should be restricted for 12 hours prior to intravenous pyelography. The colon should be emptied of gas on the previous evening and on next morning by enemata and pitressin.

First thing to do is to take a plain antero-posterior radiogram of abdomen and examine it. If it shows too much gas in the intestines, further enemata should be ordered to render the field clear. This plain radiogram may show distinct opacities due to renal, ureteric or gall stones, or calcified glands, etc. Radiograms taken in two directions often help in diagnosis. Urinary calculi are seen in the line of the pelvis and ureter in an antero-posterior radiogram and these shadows are seen just anterior to or superimposed on that of the vertebral column in a lateral view. While shadows of gall stones lie nearer the anterior abdominal wall. The shape of these shadows and their density are often a guide. A pyramidal shadow denser in the

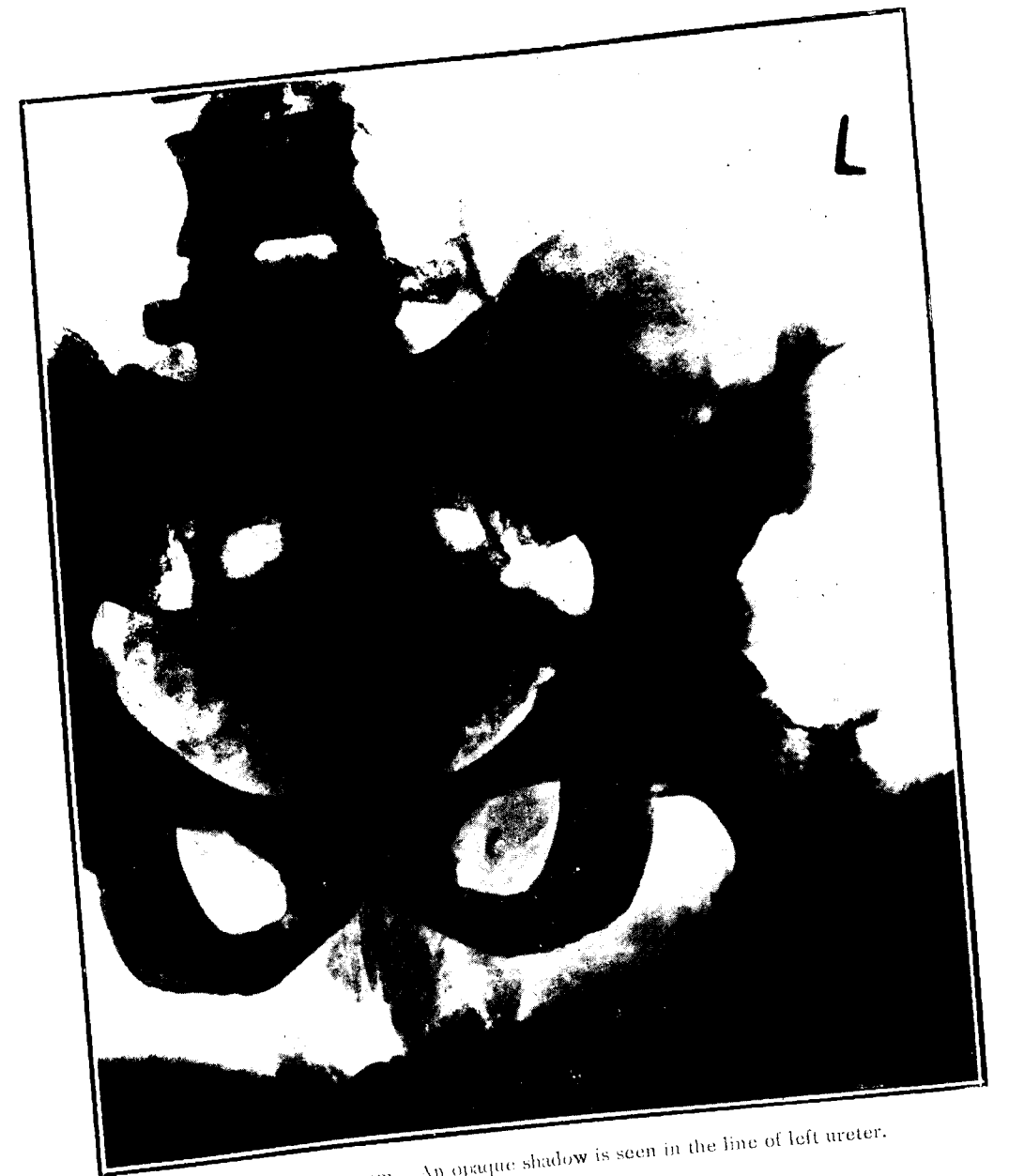
*Madras University Extension Lectures, Jan.—Feb. 1936.

centre with its pointed end directed downwards and slightly inwards opposite the transverse process of 2nd lumbar vertebra is more likely to be a stone in the renal pelvis than anything else. A dense fusiform or date-stone shadow in the line of the ureter is more likely to be a ureteral stone. Shadows of calcified tubercular glands are usually crenated and irregular. Diagnosis may be made more certain by excretion pyelography, by passing opaque ureteral catheters and by retrograde pyelography. There are certain calculi as of pure urates, uric acid and cystine which give no shadows, but their presence can be ascertained by the above methods where they may appear as negative shadows and filling defects.

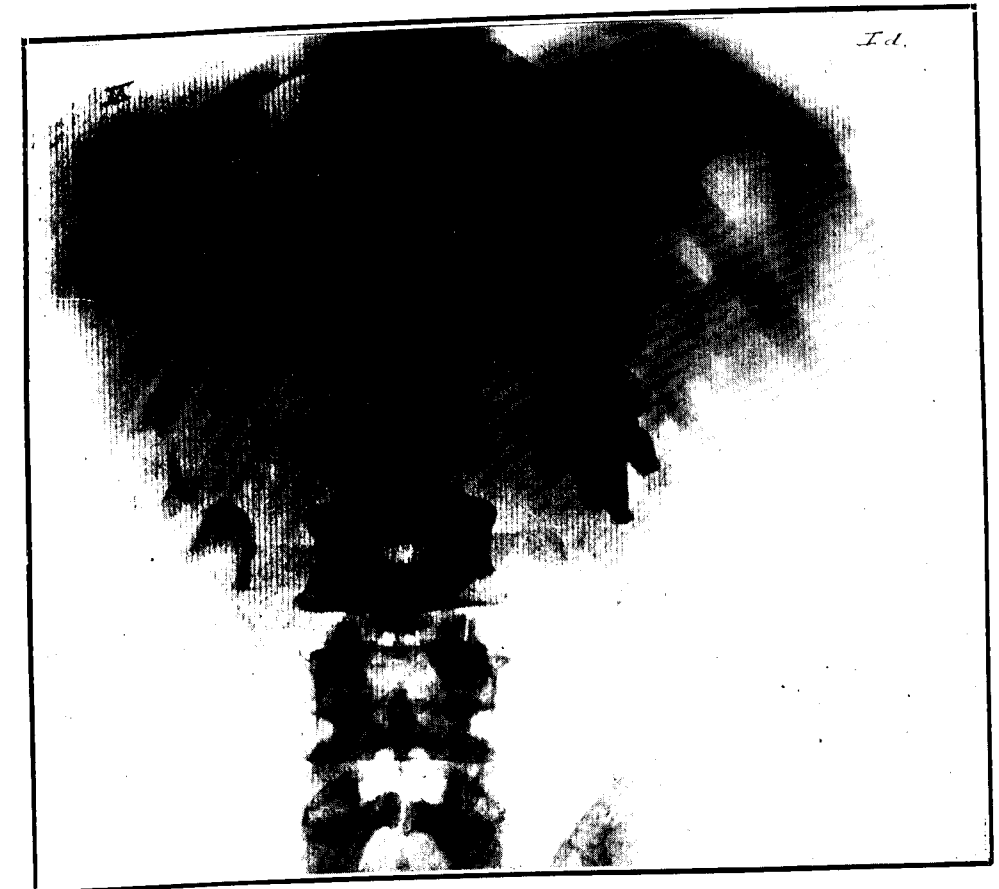
Excretion Pyelography.—There are two well known organic iodine compounds—Perabrodil and Uroselectan B, which are used for this purpose. Both have about 50 per cent of iodine content. Both are now put up in ampoules ready for intravenous injection on the roentgenological table. The syringe to be used should be boiled in distilled water and the ampoule warmed to body temperature by being placed in warm water. The tourniquet used for injection if left on till the injection is over and then removed, helps in a higher concentration of the drug reaching the kidneys and hence better pictures result. The injection itself takes about 30–40 seconds. The drug can be used in children and infants, the doses being proportionately smaller.

The advantages of excretion pyelography are obvious. Easy visualisation of upper urinary tract

without the necessity of urethral instrumentations which is either difficult or impossible in children and often contra-indicated in some cases in adults, *e.g.*, in acute and chronic sepsis of lower urinary tract, tuberculous nephritis, severe haemorrhages from urinary tract, where ureters have been transplanted into the colon, in ureteral obstructions, in bifurcated ureters, where the urea clearance is low and where instrumentation is likely to be followed by severe reaction. In addition to this excretion urography gives a fair indication of the functional capacities of each kidney and both sides being visualised simultaneously can be easily compared. In conditions of hydronephrosis there is no risk of rupture but delayed pictures should be taken of 1 to 2 hours. Relationship of intra-abdominal tumours to the urinary tract can be visualised with advantage in diagnosis and operative treatment. The contra-indications are only few, *e.g.*, severe disease of liver, acute infections of urinary tract, acute and chronic uraemia as shown by a high blood urea and a low urea clearance. Iodine idiosyncrasy is rare with this drug. If possible screening should be done and pictures taken when the urinary tract is well visualised. Usually two small spots are seen at first in the renal region. These gradually increase in size and outline the calyces and pelvis. Next the image of renal pelvis becomes continuous with that of ureter. This is the period of maximum elimination and a picture should be taken now. This ends the diastole of renal pelvis. With the onset of its systole the ureters become visible



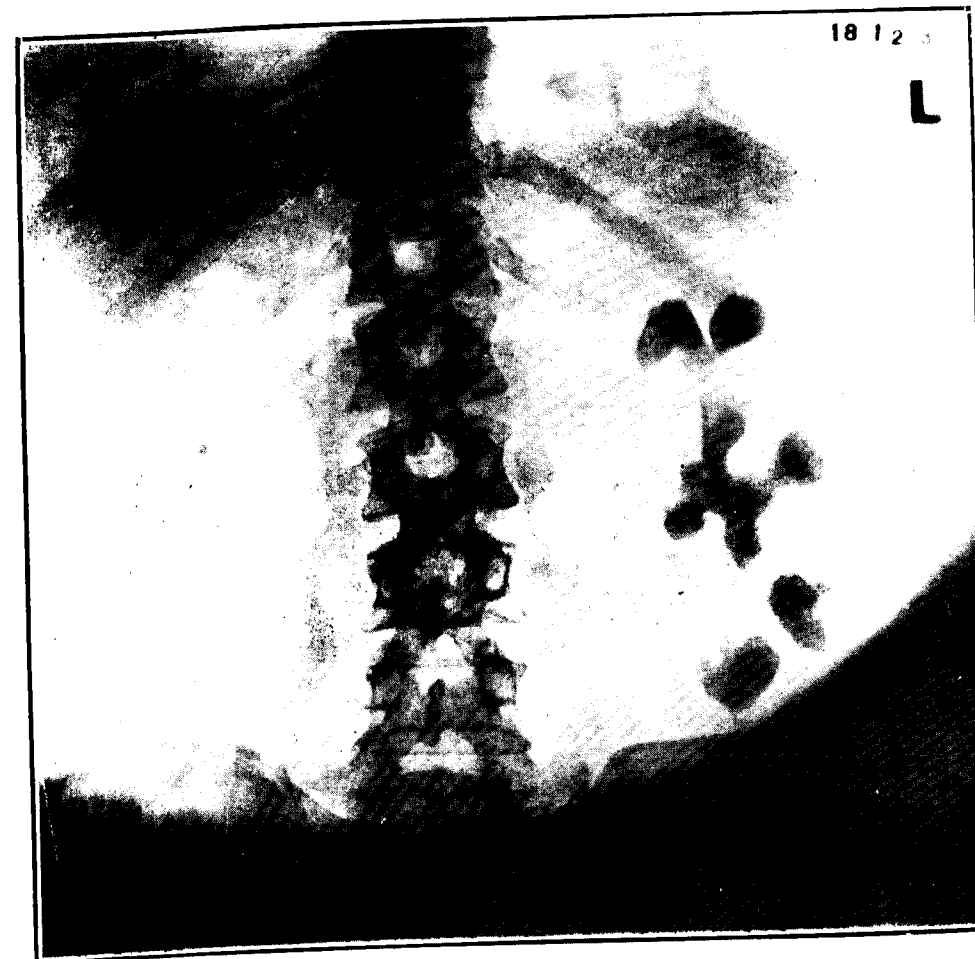
Pleani roentgenogram. An opaque shadow is seen in the line of left ureter.



Intravenous pyelogram. Right Kidney good excretion. Left Kidney shows a giant stone.
No excretion.



Intravenous pyelogram. Hydro-ureter right side. Left Kidney not visualised.



Giant stone—Left Kidney. A small stone in right kidney.



Intravenous pyelogram showing dilation of left renal pelvis and a dilated ureter suggestive of stricture ureter lower down.



Retrograde pyelogram. The right kidney has dropped down to the level of sacroiliac joint and at a lower level the ureter is narrowed. A self orienting kidney fixed in its new position. She was operated on and kidney fixed in proper position.



Retrograde Pyelogram in a case of tumour in right ureter. The index finger is between the tumour and right renal pelvis. The kidney is in its normal position.

and the bladder slowly fills out. Both sides should be compared carefully to determine the normal from the abnormal. There is often an alternating activity in the kidneys, when one is in systole the other may be in diastole. Pictures are best taken at 8—10 minutes, 20 minutes and 45 minutes with a picture of the bladder between the first and second pictures. The bladder should be emptied before the second and third pictures, so as not to obscure the lower ends of ureters. Ureteral compressions, before the second and third pictures, is one of the best methods for improving images as it increases concentration by stasis. But the compression should be applied simultaneously to both ureters, should be equal and at the same levels. This is best done by an inflated rubber bag being pressed over the suprapubic region. However this is not indicated in every case but only where an early lesion is suspected or where an intensity of the image is desired. Compression may show dilatations in the ureters which otherwise would not be noticed.

The interpretations should be done jointly with the Radiologist guided by the clinical signs and symptoms of the case. A good image indicates a well functioning kidney and a poor image means a poorly functioning kidney. Absence of an image in all pictures may mean the absence or destruction by atrophy or anuria of the kidney. If only the calyces and pelvis are seen but not the ureter and the former appear dilated, it would indicate a block at pelvi-ureteral junction by stone, growths, pressure by artery, pressure by growths

outside or kinks in the ureter, etc. If the affected side can still be visualised even after the healthy side shows no shadows, it may mean a partial block repairable by a plastic operation.

Hydronephrosis.—The minor calyces become convex towards the renal parenchyma and appear as knobs. A flattening of the curved inferior border of pelvis with inward bulge of pelvi-ureteral junction becomes evident. Finally the pelvis and calyces become enlarged and rounded.

New growths.—In the early stages some minor calyces become elongated and later groups of calyces are blotted out especially the upper ones and the outline of pelvis becomes distorted.

Tumours of renal pelvis are shown by filling defects or a complete obliteration of pelvis in the presence of some dilatation of minor calyces.

Calculi of urates, uric acid and cystine may appear as filling defects or negative shadows or as ringed shadows when the pelvis has emptied.

Megalo-ureter with hydronephrosis is the result of prolonged partial obstruction low down in the ureter when unilateral. When bilateral with a dilated bladder the obstruction is in the neck of bladder or prostatic urethra but with a contracted bladder it is due to tumours in the pelvis causing compression of both ureters.

Sometimes shadows extraneous to urinary tract may get super-imposed



Retrograde pyelogram. Left ureter and pelvis dilated.

ureters by the side of the catheters. The possibility of rupture by overdistension at any weak spot in the pelvis and ureter should be kept in mind. The medium used may be a sterile solution of sodium iodide 12.5 per cent strength or better still 15 per cent perabrodil or 15 per cent uroselectan B, as being non-irritating and giving denser shadow.

It is necessary to fully distend the renal pelvis to avoid mistakes in diagnosis, the only exception being a hydronephrosis. The normal renal pelvis takes about 5 to 7 c.cs. and anything above 10 c.cs. requires care in injection. Gravity method is best as it sustains the distension. Any pain in the back is a warning to lower the tubes and stop injection.

Reactions are liable to follow as pain, nausea, shivering haematuria and fever.

Diagnosis of early tumours of kidneys, polycystic kidneys, tumours of renal pelvis is more certain by this method. The relationship of upper urinary tract to abdominal tumours is better visualised by this method.

Calculi translucent to X-rays may be seen as negative shadows and as ringed shadows after emptying the renal pelvis. If after emptying the pelvis 4 c.cs. of air be injected such calculi and ulcerating growths stained by the iodide may be brought into better relief.

Visualisation of the lower urinary tract.

By N. MANGESH RAO, M.B.C.M., F.R.C.S.E.

This should not be undertaken in acute urethritis or cystitis until the condition has subsided under conservative treatment.

This part of urinary tract is well visualised by direct visual examination with the aid of special instruments.

Anterior Urethra—It should be anaesthetised with pentocain 0.2 to 0.5 per cent with the addition of a few drops of adrenalin. The anterior urethroscope is a simple tube with a terminal light on a carrier and a proximal eye-piece for magnification. By the aid of a small bellows air-distension of urethra is done. The tube is first introduced with an obturator as far as it would go. Then the obturator is removed and replaced by the light carrier attached to an eye-piece. As the urethroscope is being withdrawn the mucosa is carefully examined while it is gently stretched out by air distension. With this instrument soft infiltrations, ulcers, strictures, etc., can be visualised well and topical applications can be carried out.

Indirect visualisation, after injecting lipiodol and taking radiograms may be done. But the information gained by this is incomplete and inferior to direct visualisation. However pouches, diverticula and strictures can be visualised by this method.

Posterior urethra. This examination should be done under a low spinal or caudal anaesthesia. A posterior urethroscope of the irrigating type with a terminal light and a telescope (as Gearinget) is the simplest giving a direct view. A Cysto-urethroscope of the irrigating type gives a rightangled view. McCarthy's Foroblique Panendoscope is the best both for examination of bladder and posterior urethra. It gives a more satisfactory view of verumontanum and floor of urethra than can be obtained by the other two instruments. It is also more useful for operative treatment.

The distension of the urethra is done by irrigation with a mild antiseptic as cyanide of mercury 1/8000. This not only distends the urethra but keeps the field of vision clear. The fluid passes into the bladder. All types of obstructions at the neck of bladder are seen clearly. The normal appearance of vesical outlet is that of a circular lumen with a wrinkled border. A wide open sphincter is seen under a spinal anaesthetic or in cord lesions from lack of nerve control. Variations in this are caused by different types of prostatic enlargements. Enlargement of both lateral lobes converts it into a vertical slit, a middle lobe makes it crescentic, concave downwards. If both lateral lobes and the middle lobe are enlarged, the lumen appears like an



Radiogram showing a stone impacted in prostatic urethra.



A left roentgenogram. The ducts from the prostate gland are seen, and up the left ureter.

inverted Y. Any oedema of the part accentuates these changes owing to polypoid projections into the lumen. Cases of suprapubic prostatectomies show very irregular lumen, bars and sometimes annular strictures. Prostatic bars are distinctly made out in the floor of the lumen. Running from the internal meatus to the cristagalli are seen normally a few delicate folds of mucosa in the floor. In bar formations this part is found raised as a smooth elevation. The cristagalli ends at the upper part of verumontanum. Verumontanum is about 15 mm. long and 3 mm. high and is made of muscular and erectile tissue. On the summit of this is a little depression which is the entrance to the utricle. Just anterior to the utricular opening are the tiny openings of the ejaculatory ducts which can often be identified only by a fine catheter. On either side of verumontanum are two depressions known as prostatic sinuses into which open the ducts from the lateral lobes of the prostate. The ducts of the middle lobe open above the verumontanum.

The normal colour of mucosa here is a little deeper than that of the bladder. Congestion of verumontanum due to inflammation or sexual mal practices may be noticed. Granulations at the mouth of utricle, ulcers in the floor, polypi and papilloma that give rise to frequency of micturition, etc., may be seen and treated. Sinuses leading to lateral lobes of prostate may be seen on the lateral walls. Openings of false passages and fistulae may also be seen. Fine opaque catheter should be passed up these and sodium iodide solution

injected for fully visualising the tracts by a roentgenogram. Congenital valves are best seen by this instrument. Diathermy fulguration of polypi, papillomata, granulations and topical application of drugs, etc. could be carried out under direct vision.

Indirect visualisation—A plain roentgenogram may show prostatic stones or stones impacted in prostatic urethra. Fistulous tracts opening in the prostatic urethra have to be visualised by passing fine catheters into them through a urethroscope and injecting sodium iodide solution.

Bladder.—Direct visualisation is the best and is done by cystoscopy. A retrograde viewing telescope in addition to the ordinary one is of great advantage. With the former one can visualise the vesical aspect of the sphincter for an enlarged middle lobe, etc. Of this type a Swift Jolly is the best. With a cysto-urethroscope both the bladder and posterior urethra can be examined. In males the irrigating cystoscope is introduced and bladder is lavaged till return flow is clear. Where bleeding is present the bladder after emptying is slowly filled with half a drachm of adrenalin 1/1000 diluted with one pint of water. If the field is still dim, it should be emptied and filled with sterile liquid paraffin. As this does not mix with urine or blood one can make out the source of bleeding. In women it is better to lavage the bladder and fill it before introducing the cystoscope. Bladder should be distended with 8 ounces of fluid in males and 10 ounces in females. Where bladder is irritable from

chronic cystitis gradual distension should be done. A spinal or caudal anaesthesia is the best. Where blood clots are present, it is better to evacuate them by Bigelow evacuator before any examination is undertaken. Cyanide of mercury lotion 1 in 8000 is quite clear and also a good antiseptic and non-irritating. A regular examination of the whole of bladder should be done and charted out. Most pathological conditions are found round the ureteral openings, trigone and neck of bladder. A general survey of lateral walls and superior wall is done. Then the base and ureteral openings are carefully examined and compared with each other. Next the trigone and neck of bladder examined. After this ureteral catheters are passed up the ureter for visualising ureters and renal pelves. If openings of diverticula are seen an opaque catheter should be paid into them and roentgenogram done.

1. *Indirect visualisation.*—A plain radiogram would show presence of stones in the bladder or lower end of ureter and sometimes the contour of bladder as well in alkaline cystitis owing to deposit of calcium phosphates on the wall.

Cystograms.—The bladder is filled with 200 to 300 c.cs. of a 10 per cent. sodium iodide solution and radiograms in different planes are taken. These would show filling defects by growths and presence of diverticula.

Pneumocystgrams.—After completely emptying the bladder 200 to 300 c.cs. of air are injected through a fine catheter and radiograms taken. Complete filling is necessary, stop-

ping when patient complains of discomfort or the piston of syringe is pushed out by contraction of bladder. In taking radiograms an angle of 15° to 25° is given so that the lower margin of bladder is seen $\frac{1}{4}$ inch or more above the symphysis pubis. A posterior film is taken with the central ray directed upwards and forwards so as to project the coccyx and sacrum above the field. A low kilo-voltage tube of 40 to 50 K. V. is used. This brings out in relief enlargement of prostate, bars, diverticula and even fasciculation of bladder. Foreign bodies that were not visible are rendered visible by contrast. If a sodium iodide cystogram was previously done growths stained by that solution are distinctly brought out in relief.

A normal bladder gives an ovoid pneumogram of 300 c.cs. capacity, and its base is seen parallel to the upper border of symphysis.

2. A simple mid lobe hypertrophy is seen as a smooth edged ovoid projection into the bladder going well above the symphysis pubis. Lateral projections are seen in hypertrophy of lateral lobes.

3. Irregular projections from bladder base line are usually those of malignant growths. Such ulcerating growths are brought out well if previously stained by sodium iodide solution.

4. Calculi in the prostate, bladder and lower part of ureter are made more clear.

5. Growths as papillomata are seen as shadows lateral to the trigone.



Pneumocystogram showing an enlarged middle lobe and hypertrophy of right lobe of prostate.

6. Bars at the neck of bladder are shown as transverse shadows just above the symphysis pubis.

7. Foreign bodies, small stones not clearly visible in an ordinary radiogram become distinct and clearer.

8. Diverticula are brought out clearly.

9. Defects caused by tumours and cysts outside the bladder are clearly seen.

In cases with more than 12 ounces of residual urine gradual emptying of bladder should be done by withdrawing 3 to 4 ounces every hour. If well distended the first withdrawal may be 12 ounces but subsequently 3 ounces every hour should be withdrawn. A stiff No. 5 catheter should be used under usual aseptic precautions for filling bladder with air.

Ureteral Calculi and their Treatment.*

By N. MANGERI RAO, M.B.C.M., F.R.C.S.E.

Most of these are formed in the kidneys and are either temporarily or for a longer period, held up in the ureter. The ureter is made of three spindles separated by definite slight constrictions. These are called the abdominal, the pelvic and the vesical or intramural spindles. There are also two bends, the first where the ureter crosses the iliac vessels and the second just before it enters the bladder. The mucous membrane of the ureter is normally smooth and small smooth stones as of urates, uric acid and cystine are passed down with transitory and mild symptoms or silently. The sites of impaction according to Jeanbrau are :—(1) Lumbar ureter 22 per cent, (2) Iliac ureter 7 per cent, (3) Pelvic ureter 51 per cent, (4) Intramural part 17 per cent. 70 per cent of impactions occur below the brim of true pelvis. In addition to this there may be congenital or acquired strictures of ureter proximal to which impaction may occur.

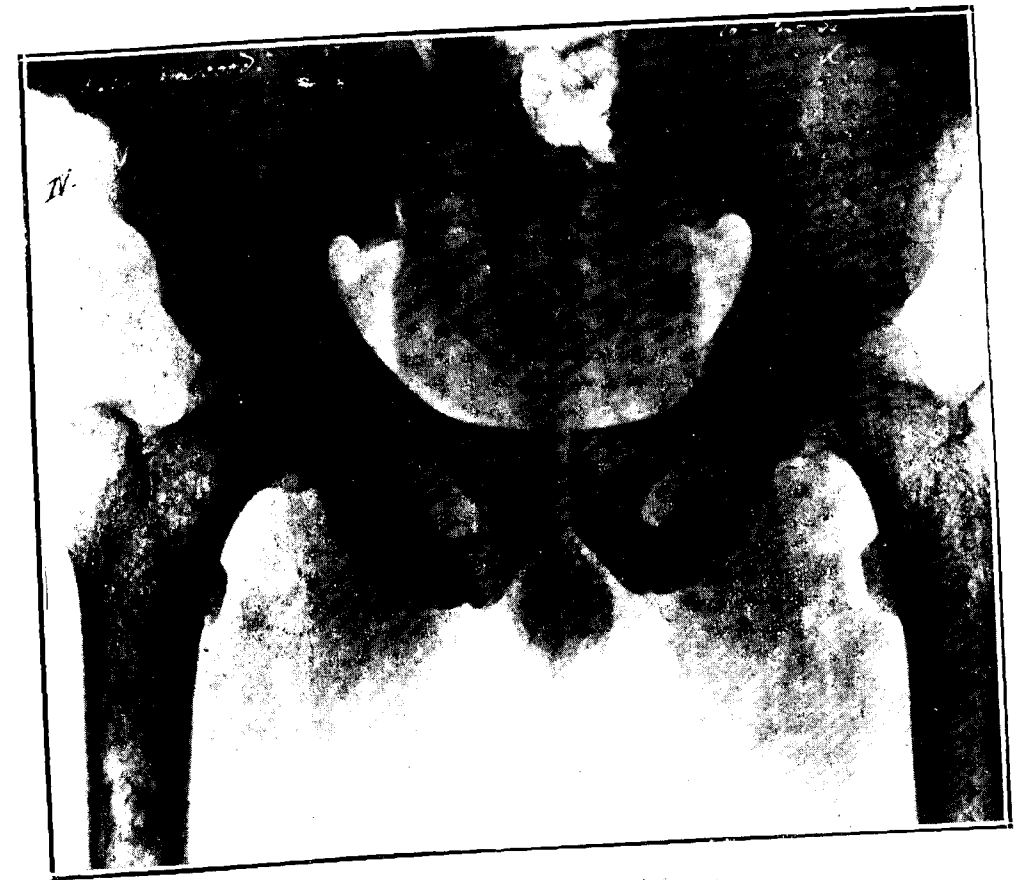
Incidence.—In children calculi are chiefly of urates and uric acid and these being smooth pass down silently or with mild symptoms, except in the presence of congenital strictures. Ureteral calculi are rare before twenty and after sixty. About 70 per cent of impacted stones occur between the ages of 20 to 50. They are twice as common in men as

women. Unilateral impaction is usual occurring with equal frequency on either side. Apart from calculous anuria bilateral impacted stones are uncommon.

Composition. 50 per cent of stones passed naturally are of uric acid. Uric acid and urate stones being smooth are not held up for long. Calcium oxalate stones being rough are irritating to the mucosa and the resulting spasm grips the calculus. In the absence of infection calcium oxalate stones predominate. B. Coli infection may occur with calcium oxalate stones, urine being still acid. In the presence of pyococcal infection phosphatic stones are usual. These may have a nucleus of calcium oxalate or uric acid or be phosphatic throughout, depending on whether infection was secondary or primary to the stone. In the majority of cases, stones in the ureter are single but if infection be present there may be more especially where stricture is also present.

Changes in Stone.—A stone when impacted for sometime grows against the urinary stream by deposit of urinary colloids and salts. If infection is present the deposit is greater and growth more rapid. In alkaline urine of pyococcal infections heavy deposits of phosphates and albuminous matter occurs.

Ureter.—The stone forms a niche for itself and the ureter round it



Stone in bladder and a stone in left ureter.

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Stone in left ureter into which two opaque catheters were passed for dilating it.

becomes fibrosed. Fibrosis of peri-ureteral areolar tissue also occurs binding the ureter to the peritoneum and the posterior abdominal wall. In long standing cases a small pouch or diverticulum results. Such may ulcerate resulting in an abscess which may burst externally or into the intestines and discharge the pus and stone leaving a fistula behind.

Kidneys.—As there is some obstruction to passage of urine the kidney above undergoes changes. The calyces, pelvis and ureter become dilated to a greater or less extent. The kidney undergoes fibrosis and parenchyma is steadily destroyed. If infection is present pyelitis and pyelo nephritis occur with more rapid destruction of kidney. The dilatation of proximal part of ureter is slight in non-infected cases and more marked in infected cases. It is greatest in cases of ureteral strictures. In the last type the stone acts as a ball valve resulting in large hydro or pyonephrosis. The stone also takes the shape of an almond being broad at the upper end.

In sudden complete obstructions by impaction of stone, the kidney ceases to secrete and is liable to atrophy if the obstruction is not relieved in couple of weeks.

The opposite kidney shows compensatory hypertrophy where one kidney is so destroyed. But this occurs only to a slight extent if infection is present in the primary kidney. A pyonephrosis of one kidney is always a danger to the opposite kidney which may suffer from toxic nephritis and even get infected through the blood stream.

Symptoms and signs.—These may be classified into those due to (1) a rapidly migrating stone, (2) those due to a slowly migrating stone, (3) those due to renal back pressure, and (4) those due to infection.

(1) *A rapidly, migrating stone.*—Smooth small stones may give rise to mild transitory symptoms often overlooked as in children and young people.

Rough stones as of calcium oxalate give rise to severe renal colic with typical radiating pains into the groin, genitals or inner side of thigh. There is a frequent desire to pass urine but little is passed out and this may show some blood. There is severe nausea, vomiting and abdominal distension. These bouts of renal colic may repeat at intervals of a few hours for couple of days till the stone drops into the bladder. The urine is visibly coloured with blood or presence of blood is only observed with the microscope. The urine clears in a few days.

(2) *A slowly migrating stone.*—It gives rise to intermittent attacks of renal colic which may recur once a day, once in couple of days, weeks or at longer intervals depending on the rate of its migration. The attacks are milder and of shorter duration. In this type there is a maximum point of pain and tenderness that gradually shifts with the site of impaction. At first it is in the renal angle, then shifts to a point half an inch below and medial to the tip of 9th costal cartilage, then along the outer border of the rectus muscle to the external abdominal ring. This point is usually a little above the site of



Stone in left ureter with retrograde pyelogram. It shows a slight dilatation of ureter.

impaction. When impacted in the abdominal spindle, abdominal symptoms as nausea, vomiting, distension and constipation are more marked. When impacted in the pelvic spindle bladder symptoms with pain referred to the testicle are present. Pain on coitus, blood stained semen, night emissions and pain on defaecation are complained of when the stone is impacted just above the intramural part, owing to inflammation extending to seminal vesicles. When impacted in the intramural part frequency of micturition and tenesmus with pain referred to the frenum when the stone is at the mouth of ureter, are present.

Changes in the urine—Haematuria.—This may be microscopic or macroscopic varying from smoky urine to that of port wine colour. The rougher the stone the greater the amount of blood. Guyon has pointed out that persistence of haematuria for more than a few days after the cessation of renal colic strongly suggested impaction of stone. The presence of white blood cells in a greater proportion than red blood cells indicates impaction of stone. In infected cases the deposit is greater due chiefly to pus cells, epithelial cells from renal pelvis and ureter and red blood cells are few or absent. Hyaline casts may also be present. Presence of blood casts is indicative of pyelo-nephritis.

Symptoms of back pressure.—Persistent dull pain in the back and tenderness to pressure in the renal angle are significant of back pressure. The kidney may or may not be palpable depending on the distension and tenseness of renal

pelvis. Large hydronephrosis are not common and even these are flaccid.

Infection.—Pyelitis and pyelo-nephritis give rise to intermittent or remittent types of temperature with shivering or rigors. There is increased pain and a tender palpable swelling may be felt. Other signs of chronic sepsaemia are also present.

Examination.

A stone in the ureter can rarely be palpated except when it is in the lower end where it may be felt per vaginum or rectum.

X-ray examination.—Radiograms may show shadows of stones in about 80 per cent. Pure urate, uric acid and cystine stones throw no shadows. An intravenous pyelogram may show the condition of kidneys, dilatation of renal pelvis or ureter and the relationship of shadows to the urinary tract.

Cystoscopy.—Changes in the ureteral openings, as oedema, congestion, haemorrhages, etc., may be seen, when the stone is in the intramural part. In acute cases of impaction the orifice is seen to contract violently and either no efflux is seen or it is small in amount and often blood stained. When the stone is actually at the orifice it can be seen projecting surrounded by bullous oedema and congestion.

Next an opaque catheter is passed up the suspected ureter and a radiogram is done. Then sodium iodide solution is injected and another picture is taken. Then the

fluid is allowed to run out and a third picture is taken. With this technique failure to show the shadow of a stone is only about 5 per cent.

Calculous Anuria.

This is the most important emergency in renal lithiasis, due to obstruction of ureters by stones. The obstruction may be—(1) Of both ureters simultaneously or consecutively with a few days interval.

(2) Obstruction of the only functioning kidney its fellow being destroyed by disease, by obstruction or absent.

(3) Obstruction of one ureter, the opposite kidney though healthy, not functioning owing to nerve reflexes.

Oliguria may occur in cases where opposite kidney is damaged by disease. Complete obstruction lasting over a fortnight is usually fatal to the kidney above. In the majority the obstruction lies in the upper portion of ureter and the stone is usually small not larger than a pea.

In fatal cases either both ureters become blocked or the ureter of the only functioning kidney is blocked. If one kidney is blocked and the other is healthy, there may be temporary anuria for 24 to 48 hours, after which it usually starts secreting. But one cannot be certain of this condition in such an emergency.

Signs and symptoms.—In many no prodromal symptoms may be evident. Often a previous history

of renal colic and passage of stones may be obtained. Some may complain of backache and polyuria preceding the onset of anuria. The painless type is serious as it indicates 'degeneration of both kidneys. In the painful type if anuria persists after pain has subsided, it indicates that the opposite kidney is functionless.

Clinical course—Stage of tolerance. During the first five days patient feels well enough to carry on his work but passes little or no urine. His blood urea rises steadily to about 100 mgms. per cent on the third day, 150 mgms. on the fourth and is usually 200 mgms. before toxic symptoms appear. Anuria is rarely absolute, a few c.c.s. of blood stained urine being passed daily.

Stage of Intoxication.—He complains of headache, thirst, craves for water and has an aversion for solid food. Tongue is dry and coated. Bowels are constipated and abdomen distended and tympanitic. Nausea, vomiting and hiccough appear. If kidneys are diseased the symptoms appear earlier.

Stage of coma.—Gradually drowsiness and mental confusion appear. Patient lies listless and apathetic. Finally coma and death occur.

Pulse at first slow and hard becomes soft, rapid and finally thready. Respiration is slow, deep and noisy. Temperature is normal at first, later it becomes subnormal. Blood urea may vary between 200 to 400 mgms per cent.

Treatment.—In the absence of uraemia, the first consideration is to establish urinary excretion by

catheterising the ureters. Under local anaesthesia and aseptic precautions a cystoscope is passed in, ureteral openings are identified and examined. Next a No. 4 or 5 catheter (Charrier size) is manipulated and passed up the suspected side. If successful in passing it beyond the obstruction, a gush of blood-stained cloudy urine escapes from the catheter. Next a catheter is similarly passed up the opposite side. The catheters are left in for 48 hours, the catheters and penis being wrapped round with sterile gauze and the ends of catheters left in a sterile bottle with a known quantity of some antiseptic. The patient is placed in Fowler's position and plenty of fluids are given. 5 per cent dextrose solution intravenously encourages urinary excretion. Solutions of sodium chloride (saline) should be avoided as it throws more work on the kidneys. Drug as Caffein citras, theocin sodium acetate, etc., encourage urinary excretion. The polyuria thus set up brings down the blood urea fairly rapidly. The renal pelvis should be lavaged with silver nitrate solution 1/10000 to 5000 daily. Catheters should be removed after 48 hours. Open operations of pyelotomy or nephrostomy are indicated in (1) Where one fails to pass up ureteral catheters. (2) Where anuria recurs. (3) Where uræmia is manifest.

It should be done under local anaesthesia with addition of gas and oxygen where necessary. After bringing the kidney out the renal pelvis is exposed on its posterior aspect and incised in its long axis and a drainage tube with its end cut obliquely is fixed into renal

pelvis by couple of catgut sutures. The tube becomes loose in 8-10 days. Some prefer a nephrostomy into lower calyx followed by insertion of a drainage tube into it.

If the exposed kidney is found disorganised or contains a large giant stone the opposite kidney should be exposed and its pelvis drained.

A kidney with acute obstruction of ureter is found to be swollen, congested and plum coloured and its pelvis is distended with cloudy blood-stained urine.

Polyuria after these operations is a good sign, but oliguria is a bad sign. Blood urea estimations are carried out daily. A falling blood-urea is a good sign. Mortality is practically nil if operation is done within 48 hours of onset, but rises steadily to 25 per cent on the third day, 30 per cent on the fourth day 42, per cent on the fifth day and so on.

Treatment of Impacted Stones in the Ureter.—This consists in aiding the patient to pass the stones with the least damage to his urinary organs.

Medical treatment is indicated in cases of gravel or calculi not more than 1 cm. in diameter. In cases of renal colic a hypodermic injection of atropine with papaverine and Tr. Ammi Visnaga 5—10 c.cs. well diluted, by mouth is advised. This is combined with ingestion of large amounts of fluid.

The contra-indications for medical treatment are :—

(1) Where signs of renal back pressure are present.



Stones in right ureter. This patient had a ureteroceles which was filled with stones. Diathermy cauterisation of the ureteroceles was done and patient passed 60 stones.

(2) Presence of chronic parenchymatous nephritis, as fluids cannot be forced in these.

(3) Evidence of obstruction in the lower urinary passages as enlarged prostate, urethral strictures, etc.

(4) Chronic hyperpiesis. Here fluids should not be forced in

(5) If urine shows presence of infection.

Cystoscopic methods are very successful in recently impacted stones of 5—10 mms. diameter.

If stone shows no signs of moving after 4—6 weeks of medical treatment cystoscopic manipulations should be tried. Ureteral catheter size 4 Charrier is passed up and attempts made to slip it up past the stone. If held up injection of couple of c.cs. of 0.2 per cent pentocain with two drops of adrenalin is injected. This reduces local spasm and congestion. After a few minutes interval further attempts may succeed and catheter slip upwards. This is shown by a free flow of urine. Another catheter is now passed along the first one. Both are left in for 24 to 48 hours. Renal pelvis is daily lavaged with silver nitrate solution 1/10000. Before their removal two c.cs. of 2 per cent papaverine solution is injected. This is followed by forcing in fluids by mouth. While removing they should be twisted several times. This may cause the stone to move down while catheters are slowly pulled out. But for stones, in the abdominal portion of ureter, with a transverse diameter of 1 cm. and a vertical one of 2 cms. an open operation is advisable. Such stones can

only be passed after much suffering and damage to ureteral mucosa and the kidney, as most of them are of calcium oxalate. Phosphatic stones are the result of infection and cystoscopic methods should not be attempted for fear of setting up pyelonephritis. A long cylindrical stone is usually "nested" and has to be removed by open operation

Stones in pelvic ureter.—Stones in the intramural part of ureter should be dealt with by cystoscopic methods as slitting the ureteral meatus with diathermy electrode or cutting instruments.

Stones above the intramural part of ureter.—The ureteral meatus is first slit up with diathermy electrode and the ureter above is gradually dilated followed by injection of papaverine solution or glycerine, etc. The stone moves down into the bladder in a few days.

Indications for open operations.—(1) Stones in the abdominal ureter, 1 cm. in diameter or more.

(2) All stones over 1.5 cms. in diameter

(3) Where nesting of stone and peri-ureteritis are present,

(4) Where kidneys show hydro or pyo-nephrosis.

(5) Where cystoscopic manipulations have failed.

(6) Where cystoscopy is badly tolerated, or ureteral manipulations cause severe reactions.

Operative treatment.—Where the kidney above is disorganised by

hydro or pyonephrosis or contains a giant stone and the opposite kidney is adequate to carry on the urinary excretion, nephrectomy is indicated. The removal of stone is done at the same sitting if easily accessible or deferred to a subsequent operation depending on the condition of the patient.

Where the renal function is good on the affected side though containing stones, the ureteral stone is removed first and then the stones in the kidney either at the same sitting or at a subsequent date.

Uretero-lithotomy.—The abdominal spindle is exposed by a lumbar incision prolonged downwards parallel to inguinal ligament. The pelvic portion is exposed best by a subumbilical median incision. The stone is palpated and fixed by the thumb and index finger of left hand and an incision is made directly over the stone and extended upwards for one centimeter. After removing the stone the ureter below is dilated by bougies. The incision in the ureter is closed by Lambert stitches of fine catgut and wound closed with drainage.

Tuberculous Risk in Life Insurance

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The subject of tuberculous risk in life assurance was suggested by the large number of claims which came to my notice owing to the death of proponents occurring within one or two years of the acceptance of the risk by the company. This certainly is due to the difficulty the examiners have in correctly interpreting the facts made out at the time of the examinations. In the very nature of things no single man's experience is good enough to be depended on in assessing a life. The general appearance of the proponent, the family history, the personal history, the previous history, history of exposure to infection and special examination for possible tuberculosis have all to be fully considered before giving an opinion on tuberculous risks. Different doctors have stressed different points and a careful medical referee will try to utilise everybody's experience so that while the proponent is given a fair valuation, the company's interests are not sacrificed. The medical examiner is really a "Referee" who has no selfish motive, (at least he ought to have none!), who stands between the proponent and the insurance company and who is expected to give a just verdict which favours no party. I shall try to give you briefly what the important points to consider are, and how to value them.

General appearance:—The thin person, who is obviously undernour-

ished and under weight, naturally comes under suspicion. Every insurance company requires height and weight to be recorded. It is presumed that when the weight is 20 per cent. less than what it ought to be for the height and the age, the person is not a good life. Before finally deciding on this point you would take into consideration the chest and its expansion (*i.e.*, the respiratory capacity), its formation and the family history. If there is obvious retraction in one of the *infra* or *supra* clavicular spaces or if there is defective movement on one side or any part of the chest, if there is obvious displacement of the apex beat and if the chest expansion is poor, if there are enlarged veins on the chest wall the life is risky. It is common to be told that the person belongs to a "wiry" family who have all been tall and thin and long lived. It may be so; but if physical examination of the chest shows the above signs the life cannot be considered safe.

Whether it should be totally rejected or accepted with a load depends on other things, *e.g.*, constant rapid pulse, somewhat raised temperature, the persistent rise of pulse and temperature on moderate exertion ought to make you reject the life even if you do not find active signs of lesion.

Occasionally external appearances are deceptive. A person may

appear to be plump and well built and yet may have a cavity with thick adherent pleura. Unless a thorough physical examination is made and the party is submitted to a good cross examination with reference to his previous illnesses and occupation, such a case is likely to be accepted and the company will be the loser.

Again the external appearances may not be helpful in incipient cases. Hence a thorough detailed examination will be needed.

Family history:—This is a point which requires careful consideration. I have sometimes seen cases recommended to be rejected because a sister, aged 22 died of tuberculosis after her second puerperium. If the sister developed the disease after she married and gave birth to a child, and lived most part of her married life with her husband it would be unfair to reject or load the life of her elder brother who appears to be of sound health simply because his sister died of tuberculosis. It has to be remembered that tuberculosis is very catching to infants, to a less extent to children, to a still less extent to youth, and adults are almost immune. Hence the brother ought not to be considered a bad risk on account of the sister contracting tuberculosis after marriage. A similar argument holds good as between a wife and a husband. George Florschütz says that "In medical selection one must certainly consider the risk of infection when it is so evident as in conjugal intercourse, but in general, as far as life insurance is concerned one may regard tuberculous infec-

tion as purely a matter of chance". According to statistics supplied by him "Of 1428 deaths from tuberculosis there were but eleven in which the husband or the wife of the deceased was tuberculous". But with the average Indian with his poverty, overwork and life in congested tenements the chances of risk are considerable. Certainly they are more than in the cases of attendants in Tuberculosis hospitals and Sanatoria. Such lives ought to be accepted with a load so long as the proponent is healthy at the time of proposal.

Fishborg working on the data available concludes that "While the death-rates of infants descended from tuberculous stock is very much higher than that of others, adults of this class have not been shown to develop phthisis to a degree as to bar them from insurance. Familial tuberculosis affects mainly infants: the susceptible are weeded out during the first few years of life". Others develop a certain amount of immunity. If they catch the infection in later life the disease is likely to run a chronic course. Hence Fishborg is of opinion that "After careful examination those with a family history of tuberculosis should be given rated policies when found otherwise acceptable". I usually give them a short endowment policy if they have passed twenty-seven. If they are still in their teens I recommend postponement of policy.

Previous History.—If an adult, say, aged about 25 wants to insure his life and he shows evidence of having suffered in childhood from tuberculosis of glands, bones or joints in the scars or deformity I

would not advise a rejection. Who is there who has not had tuberculosis at some time of his early life? What about the persistent cough, the frequent colds, the chronic diarrhoeas of childhood. The x-ray has shown what a number of adults have sclerosed or calcified hilum glands. These evidences of past lesions survived point to the individual possessing a higher resistance than normal and ought not to disqualify the person. At the same time we notice that an attack of influenza or pneumonia may set up (and statistics do support the statement) acute miliary tuberculosis. Hence people who show scars of past tuberculous disease ought to be heavily rated or considered for endowment. Straight whole life policies should not be given to them. The American medico-actuarial investigation of 1914 showed that among insured persons who gave a history of bone tuberculosis the mortality rate was 190 per cent of the expected mortality. The longer the period of good health that intervenes between such early extra-thoracic tuberculosis and the date of insurance the less the incidence of mortality; for example, according to the same authorities, where more than ten years have elapsed before the application, the mortality ratio was only 120 per cent of the expected mortality.

Pleurisy.—Every text book has mentioned that about 95 per cent cases of pleurisy are tubercular in origin; that a very large percentage of people who recover from pleurisy develop pulmonary tuberculosis sooner or later. The actuarial investigation has shown that if the pleurisy has occurred within five

years prior to insurances the death rate is three times the normal; five to ten years prior to application, about twice the normal. If the pleurisy has occurred more than ten years prior to application, it need not be considered too seriously and may be accepted for a rated life or endowment. The others have to be rejected and I advise rejection. But Anderson (Am. Rev. Tuberc. 1928) pleads for greater concession. He says "Recovered cases over thirty years of age which have regained their normal weight, in which there is no family history of tuberculosis, and the applicants, weight does not fall below the family characteristic *after five years* may be accepted at standard rates". But though his pleading may be good for America it is not good for India and its conditions.

Influenza.—This was considered as a predisposing factor for Tuberculosis. It appeared to be so soon after the influenza epidemic of 1918. Probably the quiescent lesions flared up. When only sporadic attacks are considered they need not weigh too heavily against the proponents. They can be accepted for endowment if the party has passed the twenty-seventh year provided there are no obvious tuberculous lesions. In younger people the risks are fairly heavy and suitable loadings with short term policies are indicated.

Colds.—If Careful investigation locates the lesion as due to only rhinopharyngeal changes, these cases need not be rejected. But in such cases, as there is usually a certain amount of calcium deficiency, first postpone the acceptance for a year and advise the party to be treated for the nose

and throat symptoms and if after that period the lungs are showing no signs of disease except with a small load of 2 to 4 per cent.

Old Tuberculosis of Lungs.—If only suspect, *i.e.*, no T. B. found carefully examine the proponent on different occasions at intervals of months and if you find no suspicious signs then the life may be considered and a suitable load added. If T. B. has been found at any time reject.

Haemoptysis.—The medico-actuarial mortality investigation found the following mortality rates;—In people with

(1) one attack within five years of application the death rate from tuberculosis was five times normal.

(2) one attack between five and ten years of application the death rate was about $3\frac{1}{2}$ times.

(3) One or more attacks, the last more than ten years prior to application the death rate was twice normal.

Risk of Infection.—This need not be considered as a risk except when exposure to massive infection occurs in the wake of an attack of typhoid, influenza, measles or some debilitating disease like diabetes. Generally speaking every one is getting a mild infection every day but that does not mean that the disease will start. It is only when exceptional exposure occurs under exceptional circumstances that one need seriously consider this problem. In Germany no insurance company rejects a proposal simply because of

a history of exposure to tuberculous infection as in the case of one living with a tuberculous consort.

Whenever general appearance, family history, previous history or liability to infection creates suspicion, physical examination of chest must be thorough. For this the body must be uncovered as far as the waist. There must be a good light. The room must be free from noises.

A flat chest often means an old broncho-tracheal tuberculosis. Unless definite active signs are seen these need not be rejected as they are likely to have acquired a certain amount of immunity. *Local retractions* are of very great importance. Be sure of the percussion note in the second and third intercostal spaces slightly to the lateral side of the midclavicular line and also in the supra scapular space. Diminished resonance in these areas are highly suggestive. If on auscultation you hear rales in one of these places only and if these rales persist even on coughing and if they are heard in the same area even on an examination a few days later then you may be certain you are dealing with tuberculous disease. No applicant should be recommended for a policy in whom rales are heard over the upper third of the chest anteriorly or posteriorly. If adventitious sounds of whatever character are heard at one or other of the apices, reject.

In the incipient stage when proposals are likely to be made you are not likely to have adventitious sounds. Look out for the B. V. sounds or diminished breath sounds.

Fishberg gives the following limits:—"If the breath sounds are weak, feeble or absent in one of the apices there is ground for caution. Urging the applicant to cough may provoke rales or crepitations in the same area. In others the expiratory murmur may be prolonged or bronchial in character; in some B. V. sounds are heard. If the resonance over the apex is impaired over the area with feeble breath sounds tuberculosis is to be thought of. Changes in the breath sounds limited to a circumscribed area are more important in this regard than when heard all over the chest". Please take the above hints as helpful when other signs are also present

Constitutional symptoms though important for diagnosis are not likely to be present in people when they propose for insurance. But there is one sign which is never lacking—the rapid pulse. If you suspect rapid

pulse is due to nervousness, postpone examination to another day and if you still find the tachycardia, reject.

If breath sounds are suspicious and pulse rate about 70, postpone for six months

Though a person may be underweight if he shows no signs of present or past tuberculous changes in the lungs, if he is free from sugar and he is not suffering from cancer or other wasting disease he may be passed with a load. Cases which have recently gained weight rapidly require careful scrutiny before being passed as first class. Note whether the tissues feel soft and the skin flabby; if so it is very suspicious and deserves to be put in the second class even if there are no detectable signs in the lungs.

If there be unequal pupils or clubbing of the fingers or atrophy of the pectoral muscles along with other signs reject

The Anti-Pernicious Anæmia Principle.

(A SYMPOSIUM)

J. CHRISTODOSS DAVID, M.B., B.S., PH. D.

Whipple in 1925 showed, as the result of a series of experiments, that liver feeding in dogs, rendered anæmic, produced a much greater beneficial effect than did the largest doses of iron, and it was found that in this condition liver was about four times as effective as spinach. Liver contains both copper and iron and since the beneficial effect could be obtained in simple anæmia with liver ash, it was possible that this effect was due to the mineral content of the liver, but neither iron nor copper has any effect on pernicious anæmia. Minot and Murphy (1926) tried the effect of feeding cases of pernicious anæmia on large quantities of raw liver daily, and found that this produced remarkable relief in the symptoms of the disease. Sturgis, Isaacs and Shaw (1929) pointed out the efficacy of feeding cases of pernicious anaemia with hog's stomach. Working on the knowledge that the gastric juice of patients suffering from pernicious anæmia is almost invariably deficient in pepsin and hydrochloric acid, Wilkinson (1930) fed such patients with beef predigested in the normal stomach and obtained results comparable with those got by means of the liver diet. He failed to obtain relief with beef alone or with beef digested with HCl and commer-

cial pepsin. Castle etc (1928) showed that when normal gastric juice was incubated with beef or some other substances, the mixture when fed to a patient with pernicious anæmia led to a marked reticulocyte response. He then showed that gastric juice alone or beef by itself was ineffective. Other experiments showed that incubated mixtures of pig gastric mucosa and beef also gave positive results. Thus it became apparent that the active agent in gastric juice was originally derived from the gastric mucosa. Castle elaborated a theory on the basis of these experiments of the existence of an "intrinsic" factor in the stomach or gastric juice, and of an "extrinsic" factor in beef or other substances which by their interaction led to the formation of the anti anæmic principle, which is then stored in the liver until required for red cell formation.

The name of "*Haemopoietin*" was given to this *intrinsic* factor or enzyme said to be produced by the glands in the pyloric end and probably in the fundus of the stomach. It is thermolabile and is different from the anti-anæmic factor found in the liver which is thermostable and can be heated in vacuo at 60° C., for prolonged

The Anti-Pernicious Anaemia Principle

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periods. Castle believed that such a specific reaction between the *intrinsic* and *extrinsic* factors occurred in the gastrointestinal tract of all normal individuals and that the basic defect leading to the development of pernicious anæmia was the inability of the gastric mucosa to secrete the *intrinsic* factor and the failure of the normal specific reaction to occur. However, it has been difficult to reconcile all the known facts with this hypothesis; for instance, the effectiveness of fresh gastric mucosa alone or of whole dessicated stomach. It has been necessary to assume the presence in this material of some substance acting as the *extrinsic* factor.

The experiments of Greenspon, (J. A. M. A., Jan. 25, 1936), now seem to provide a simple explanation for the known facts without hypothesizing the existence of an extrinsic factor. When dessicated stomach was incubated with pepsin and hydrochloric acid and subsequently given to a patient with pernicious anaemia a reticulocyte response did not occur. Stomach tissue was then depepsinised and then administered; a definite hæmopoietic effect resulted. The depepsinised tissue incubated with pepsin and hydrochloric acid was ineffective; but when it was incubated with hydrochloric acid alone reticulocytosis was obtained. Thus it was demonstrated that (1) the pepsin content of normal hog gastric mucosa could be removed without destroying the anti-pernicious anæmia principle, (2) peptic activity destroys the anti-anaemic principle and (3) HCl alone does not inactivate this principle.

Greenspon administered calcium carbonate to two normal subjects to diminish the acidity of the gastric juice; the latter was then aspirated into a cold container and immediately neutralised. This was given daily to a pernicious anæmia patient; contrary to Castle's results with untreated gastric juice, a reticulocyte response of 14 per cent occurred on the seventh day. Thus it was shown that when peptic activity was sufficiently diminished or prevented by neutralisation and low temperature, the principle in gastric juice alone is an efficient anti-anæmic agent. Castle has stated that the active principle in gastric juice is destroyed by heating to 60-70°C., for half an hour, or to 40°C., for forty-eight hours. In view of the fact that gastric juice is an acid solution of pepsin which attains maximum activity at 40°C., it seems likely that at this temperature the anti-pernicious anæmia principle is destroyed by peptic activity.

On the basis of these results Greenspon has interpreted Castle's findings—the beef or other source of "extrinsic" factor incubated with normal gastric juice binds the pepsin and prevents it from inactivating the anti-anæmic principle which otherwise occurs unless the precautions adopted by Greenspon are used. The enzyme, pepsin has a strong affinity for protein, such as that in beef and fibrin. When such protein is in contact with pepsin in a fluid menstruum, the pepsin is adsorbed to the protein. So the beef served to protect the anti-pernicious anæmia principle and not as a substrate for the action of the so called "*intrinsic*" factor.

It is therefore no longer necessary to assume the existence of an *extrinsic* factor.

When Castle and Strauss obtained positive results with mixtures of gastric juice and *autolysed yeast* as they had with gastric juice and beef, the extrinsic factor became identified with *vitamin B 2*. Autolysed yeast was believed to serve as the *extrinsic* factor in the manner of the beef of earlier experiments. Inconsistent with this idea is the fact that while beef *per se* had been found ineffective, autolysed yeast has now been shown to be moderately effective in pernicious anæmia, and as strikingly effective as liver in the pernicious anæmia of the tropics. This action of autolysed yeast cannot apparently be therefore due to the presence of the so-called *extrinsic* factor, nor is this hæmopoietic factor apparently the stomach principle or the liver factor, though it does resemble the latter in being thermostable and soluble in 70 per cent alcohol. A possible clue is furnished by the fact that it is definitely more effective in the pernicious anæmia of the tropics than in the Addisonian type. The former is a much less severe condition, and shows less damage to the gastric mucosa. It would appear then that autolysed yeast is more effective when there is less damage to the secreting gastric mucosa. Is it possible that autolysed yeast contains elements that are capable of stimulating the cells that elaborate the gastric anti-anæmic agent or that these elements furnish material for the synthesis of the latter? (*Greenspon*).

The relationship between the anti-pernicious anæmia principle in

the stomach and the liver is at present not clear, though there is hardly any doubt that a definite relationship exists. Present knowledge suggests that the stomach mucosa is the seat of production and that the liver stores the active principle but does not form it. Is it possible that the thermostable principle in the liver is a *hormone* and that the stomach factor is its precursor or alternatively the thermostable factor in the stomach is of the nature of a *kinase* through the action of which the active liver principle is formed? (*Greenspon*). It may be said that the stomach principle presents a certain resemblance to insulin, since each is elaborated by a glandular structure which also produces digestive enzymes capable of an antagonising action.

The first effect of this treatment is the rapid increase of reticulocytes in the blood from 15 to 40 per cent of the total red cells. At the same time haemoglobin is formed and as a result both the number of red corpuscles and the total haemoglobin content of the blood rise steadily, but as the former rises more rapidly the colour index falls even below unity. The reticulocytes now decline. There is increase in uric acid excretion due to destruction of the nuclei of the *megaloblasts which have been caused to mature in a normal manner* and lose their nuclei to become normal erythrocytes. Therefore large red cells disappear. Bilirubin content of the blood falls to normal. The achlorhydria, however is unaffected.

While liver treatment does not influence cases with involvement of the postero-lateral tracts of the

spinal cord, treatment with gastric substance produces great improvement in them. This is said to be due to the presence in the gastric secretion of another principle to which the name, "*Neuropoietin*" has been given. This is said to be essential to the normal nutrition of the central nervous system and in its absence degeneration of the posterior

and lateral columns of the cord occurs.

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 Greenspon. 1936. *J. A. M. A.* Jan. 25.

Clinical Memoranda.

A CASE OF MALIGNANT ENDOCARDITIS DUE TO HAEMOLYTIC STAPHYLOCOCCUS AUREUS.

REPORTED BY DR. S. K. SUNDARAM, B.A., M.D.

Mr. N, a Hindu male, age 30 a clerk, was admitted in Dr. M. R. Guruswami Mudaliar's wards in the General Hospital, Madras, on the 4th March 1936, with unconsciousness and fever of a day's duration.

Patient went as usual to his office the previous day, but returned home with fever at 1 o'clock. He vomited once. He did not complain of shivering or headache. The temperature rose to 105 degrees F. in the evening. Patient retained consciousness till 10-30 at night.

Patient was having "rheumatic" attacks for the last five years. Two years back he was confined to bed for a month and a half. Ten days back he had fever which lasted for a week. The fever was continuous for two days and then remittent.

Patient was married and had two children.

On Physical examination on admission, the patient was a plumpy, anæmic individual, unconscious, slightly cyanosed. Alae-nasi were active. Throat was not inflamed or congested. Pupils were dilated but reacted to light. Kernig's sign was negative.

The apex beat was visible and palpable in the fifth left intercostal

space an inch below the left nipple. The impulse was strong and forcible, and associated with a thrill. The percussion boundaries of the heart were $3/4$ " external to the left nipple in the fifth intercostal space on the left side and an inch to the right of the right lateral sternal line on the right. The sounds were very loud and rapid. There was a harsh systolic murmur in mitral area well heard even over the left intercapular region. The second sound was very much accentuated over the pulmonary area, and also over the area of impulse.

There was nothing else of note, except that the capillary resistance test was negative.

Perpheral blood film showed striking polymorphonuclear leucocytosis, confirmed by a total count of 28,100 per c. mm. Urine was drawn for examination and was dark coloured, acid, had a specific gravity of 1024, contained no sugar, but had albumin and plenty of blood; and under the microscope plenty of red blood cells and a few pus cells.

Blood and urine were sent for culture. A hæmolytic *staphylococcus aureus* was grown from both.

Though the outlook was desperate patient was given antistreptococcal serum, soda salicylas intravenously

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and intervenous glucose after blood letting. Pulse rate which was 120 on admission went up to 180 before death the next after-noon.

The only reason for reporting this case is the rarity of positive cultures of staphylococcus from blood. Recently there have been increasing reports of staphylococcal food poisoning outbreaks and septicæmias. We are not aware of a proved case here in Madras. Positive staphylococcal cultures are

usually considered as contaminants and ignored. In the case reported the same variety of staphylococcus was grown from blood and urine and it was hæmolytic. The presumption is therefore in favour of a genuine staphylococcal septicæmia, with a focus in the mitral valves.

My thanks are due to my chief M. R. Guruswami Mudaliar and the Superintendent of the General Hospital, Madras, for permission to report this case.

A CASE OF COMPLETE HEART BLOCK.

REPORTED BY S. K. SUNDARAM, B.A., M.D.

G., a police constable, aged 28 years, Hindu, was admitted in Dr. M. R. Guruswami Mudaliar's wards in the General Hospital, Madras, on the 5th December 1935, with a complaint of breathlessness of five days' duration. The trouble started suddenly as he was going to duty after his day's meal. He vomited, felt better and went on to work. Subsequently he got breathlessness after every meal, relieved by vomiting which would come on an hour after the meal. Appetite was good. Giddiness was the only other symptom associated with the breathlessness.

There was no previous history of dyspnoea, and no history of sore throat. Patient admitted to having had fever off and on with pain in the limbs.

Patient was a non vegetarian, used to smoke and occasionally to drink. He was married, but had no children.

On physical examination on admission patient was somewhat

pale, but well nourished. The positive findings of note were a very slow pulse at the wrist of 32 per minute and an apparently corresponding apical rate. Patient was put at absolute rest in bed and on glucose and barium chloride, 1 grain b. d. He was to have atropine and adrenalin by subcutaneous injection if he felt faint or had convulsions. The pulse rate taken hourly varied from 32 to 12 and was not affected by adrenalin and atropine. With the lower rates he became weak, and fainted, and was resuscitated with adrenalin and atropine. B. P. on admission was 100/55 mm of mercury and showed no striking variation. The pulse rate too never went up above 32.

On careful examination on the evening of the day of admission, it was noticed that the præcordial rate was apparently three to four times the pulse rate; synchronous with the radial pulse and carotid thrust there were palpable beats over the præcordium and audible double

sounds. In between them there were palpable single beats and audible single sounds over the region of the heart. These were very well felt and heard over the second and third left intercostal spaces and were synchronous with visible and palpable jugular pulsations.

There was no fullness of the jugulars. The left border of the heart on percussion was an inch and a half outside the left nipple in the fifth intercostal space.

On the strength of the single and double sounds described above the first diagnosis of heart block of the third degree was revised in favour of a dominant ectopic rhythm, the majority of the ectopic beats being considered too feeble to open out the semilunar valves. Barium chloride was accordingly stopped from the 7th December and patient was started on quinidine sulphate, 2 grains t. d. He was also given calcium gluconate with a view to reduce the neuromuscular irritability which, it was thought, might be responsible for the crop of extrasystoles. The numerical and spatial relations between the single and double beats were not constant.

As the apparatus had at the time gone out of order, an electrocardiogram could not be taken before the 13th December. The one taken on that date and all subsequent records showed complete dissociation of auricles and ventricles. Copy one of the earlier tracings is attached, (I) and also copy of a radial sphygmographic record taken on the 12th instant. The single beats and sounds synchronous with the jugular pulsations then were

auricular in origin and were independent of the idioventricular double beats and sounds simultaneous with the carotid thrust. Their true nature was missed because of the intensity of the auricular sounds and the constant variation of the idioventricular rate. It would have been suspected had greater attention been paid to the regularity of each series, the single and the double beats and sounds though independent of each other. In view of the new light thrown by the electrodiagram, quinidine was stopped on the 14th December and barium chloride was reinstituted in the faint hope whether it might not irritate the conducting tissues sufficiently to overcome the block. The only effect it had was to produce an occasional ventricular extrasystole.

On the 16th December the patient's heart and aorta were radiographed. Prints of the skiagram, antero-posterior and lateral views, are reproduced. It shows tremendous enlargement of the left side of the heart. The radiographic findings were confirmed by screening on the 21st December.

Blood had been sent on the 7th December for serum reaction. The Kahn flocculation test was returned as doubtful and the Wassermann reaction as positive. Patient was accordingly put on potassium iodide, half a drachm to start with, going up to a drachm daily, and intramuscular bi-weekly injections of 2 cc of collosol mercury sulphide (Crookes).

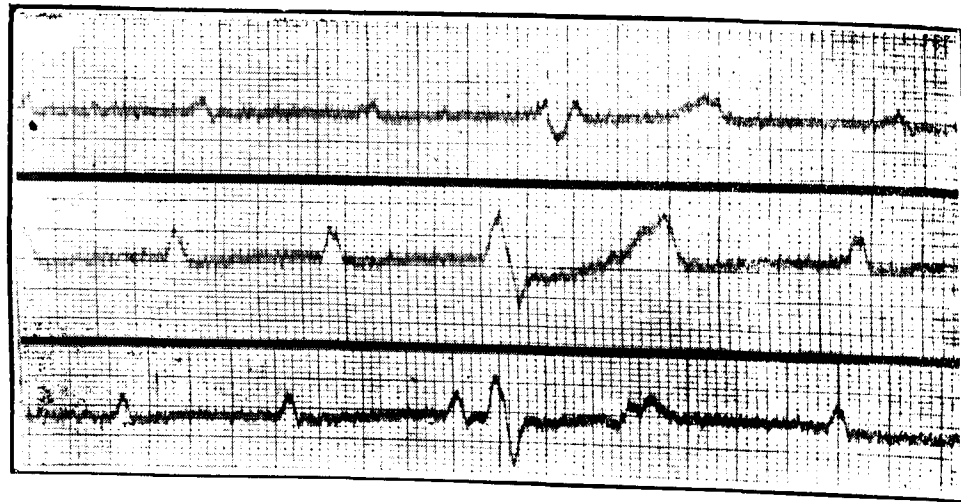
Further note of interest is that on the 2nd January 1936 the auricular contractions were no longer felt or



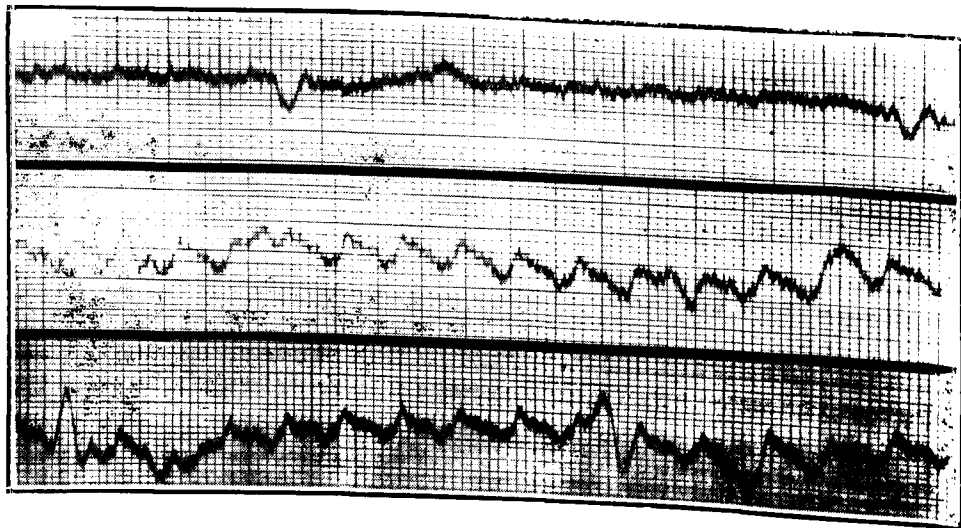
Skiagram of chest. (Antero Posterior view.)



Pulse tracing.



Electro cardiogram I.



Electro cardiogram II.

heard with distinctness. The corresponding jugular pulsations were however present. An electrocardiogram taken on the 3rd January showed no change.

Barium chloride was stopped on the 7th January. From the 17th instant patient began to have 20 minims a day of tincture of belladonna.

An electrocardiogram taken on the 27th January showed striking increase of the rhythmic 'P' waves and the usual independent rhythmic ventricular complexes; a copy of the tracing is attached (II). Corresponding physical changes were present. The jugular pulsations had completely disappeared, there was marked jugular stasis and the auricular contractions could not be felt or heard. The impulse over the third left intercostal space was mild. The liver was increased in size. Röntgenographic signs of cardiac enlargement were unaltered. Of symptoms however there were none. The patient was comfortable, was walking about a little without dyspnoea, had very slight cough and no giddiness or faintness.

On the 12th instant, he was reported to have had two fits. At 10-30 a.m. on the 15th February after considerable hesitation the patient was put on for a second time on quinidine sulphate, 2 grain t. d. On the night of the 14th February the auricular sounds were again heard loudly, having a varying relation to the ventricular sounds. As the patient was being wheeled on to the electrocardiographic department he fainted and had fits. There was at one moment complete ventri-

cular standstill, followed immediately by a succession of coupled beats and later by irregular beats of greater frequency than usual. Atropine and adrenalin were given hypodermically, the foot of the bed was raised and continuous oxygen inhalation was commenced. The patient recovered his consciousness in ten minutes. At noon when he was next examined he had the usual complete auriculo ventricular dissociation.

On the 17th morning at about 8.30 a. m. the patient's condition began to get precarious. He had a number of Stokes—Adam seizures. During two such clinical cardiac standstills intracardiac adrenalin took the radial pulse rate to 52 per minute but the rise was ephemeral. In spite of heroic therapy the patient died at 1 p.m. on the 17th February 1936. Post mortem examination was not available.

Comment.—Points of interest in this case are —

1. The cause of the complete heart block,
2. The inconstancy of the ventricular rate,
3. The intensity of the auricular sounds,
4. The cause of the development of the auricular tachycardia (flutter),
5. The part possibly played by quinidine in the final stages.

1. The cause of the block was either a syphilitic process or a coronary accident. If syphilitic, it was probably not gummatous as treatment was ineffective in overcoming the block. Complete heart block as a rare manifestation of coronary thrombosis is recorded. In the present instance however the patient

had been at work for five days after the initial vascular accident.

2. The inconstancy of the ventricular rate was very misleading. "When there is a widespread disease of the myocardium," however, the idioventricular centre setting pace for the ventricles may "apparently" occasionally show an inconstancy in its performance. Its automaticity for impulse production may at times fail for longer or shorter periods so that the resulting ventricular rate may occasionally become profoundly slow and irregular, 20 or less per minute." (Irving Roth), (rarely 10 or even 2 or 3 beats a minute—White).

3. The intensity of the auricular sounds was so misleading as to put us off the track of the originally suspected complete block altogether.

4. The causation of the auricular tachycardia (flutter) is obscure. Barium chloride had been stopped on the 7th January, but between the 3rd January and the 27th there was no electrocardiographic record taken. The patient was on no other drug that would irritate the heart muscle fibres. Whether it was part of the disease is more than one can say.

5. When auricular tachycardia (flutter) was first discovered on the 27th January, quinidine was thought of with a view to putting an end if possible to the abnormal auricular rhythm. It was prescribed in fact only on the 12th February and in very small dosage. The early onset of the fatal convulsions made one feel whether the quinidine could have been responsible for them. During the earlier fits of the last

two days it was thought that the convulsions might be due to an unsuccessful attempt of quinidine to overcome the block by trying to restore the normal auricular rhythm and forcing it down the conducting tissues.

About this time the American mails brought a report in the Journal of the American Medical Association of the 21st December 1935 of a case of arteriosclerotic complete heart block in a man of 68 years of age. The reporter W. Lawrence Cahall presents electrocardiographic evidence of paroxysms of ventricular fibrillation produced by quinidine and controlled by adrenalin in his case. He quotes authorities to suggest that quinidine (and digitalis) depress intraventricular conduction time in the branch bundles and Purkinje fibres and increases the hazard of a circus movement in the ventricles. But his recommendation of adrenalin to abolish ectopic beats would seem to be against the recognised pharmacologic action of adrenalin to enhance the irritability of the ventricles and stimulate the idioventricular pacemaker.

The whole question turns round the solution of this problem: is the clinical asystole in Stokes-Adams syndrome due to actual ventricular standstill or ventricular fibrillation? Cahall's references are all to Stokes-Adams syndrome, not to proved ventricular fibrillation. In his own case however he gives electrocardiographic evidence of ventricular fibrillation as the cause of clinical asystole. It was unfortunate that in the case here presented we had no opportunities of electrocardiogra-

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phic records being obtained without the patient being sent to the department.

Nathanson indeed in the Journal of the 25th January 1936 questions the Cahall's premises regarding the mechanism of Stokes-Adams syndrome. While admitting recently that ventricular fibrillation is indicated as an occasional cause of Stokes-Adams seizures, he quotes previous experimental and clinical reports to show that adrenaline is the most potent factor in the induction of ventricular fibrillation and is decidedly dangerous in patients predisposed to ventricular fibrillation. Adrenalectomy would seem to decrease susceptibility to ventricular fibrillation because of synergistic increase of ventricular rhythmicity. In fact he made the unchallenged claim before the Central (American) Society for Clinical Research in November 1935 that the ventricular rhythm induced by adrenalin was effectively prevented by quinidine!

It only remains for me to acknowledge my indebtedness to my

chief Dr. M. R. Guruswami Mudaliar and to the Superintendent of the General Hospital, Madras, for encouragement and permission to report the case, to the Medical Superintendent and Dr. C. Todatri of the Barnard Institute of Radiology for the reprints of the skiagrams and the electrocardiograms, and to the student who got up for me the references to the inconstancy of the idioventricular rhythm.

During the stay in hospital of the patient whose case history is given above, we had an old man admitted in our wards for pain on the right side of the chest associated with a pleuritic rub. He gave a history of fits recently. He had a good, steady pulse of about 40 per minute. His electrocardiogram was a surprise: a complete heart block. Before it was received the patient had run away one evening.

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1. Cardiac arrhythmias by Irving Roth
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3. Journal of the American Medical Association, CV: 25 (December 21, 1935), 2054.
4. Ibid, CVI: 4 (January 25, 1936), 314 and 324.

AN INTERESTING CASE OF INTUSSUSCEPTION.

REPORTED BY DR. MISS. A. HARDY, M.B.B.S., M.R.C.P.E.

Mrs. R. D. Anglo-Indian, age 49 years, admitted into the Victoria Caste and Gosha Hospital, Triplicane on January 24th 1936.

Complaint.—Pain abdomen, vomiting, passing several stools containing blood and mucus.

Duration.—8 days.

History.—The patient is a resident of Bangalore—January 16th

she had diarrhoea, about 8 watery stools—this continued for three days—On the 19th morning she took half an ounce of castor oil, and felt much better that day. But on the 20th she had several motions again, and these now consisted of pure mucus and blood, with griping pains in the abdomen and vomiting—she was treated in Bangalore with emetine injections but finding no

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improvement came to Madras for treatment.

Condition on admission.—Well nourished—T 99.6—P. 84 R. 22. Tongue thickly coated.

Abdomen greatly distended—no fluid thrill or shifting dullness.—Tenderness below left costal margin.

Heart and lungs N. A. D—urine normal—Blood picture, nothing special.

On the first day she had six motions made up entirely of mucus and blood.

Microscopical examination showed a number of R. B. C.—not much cellular exudate, a few Charcot—Leyden crystals, and one degenerating cyst (?)

For three days in succession 1 grain of Emetine was injected H. D—but the character of the motions did not change—The patient vomited several times large quantities of dark green liquid—Severe abdominal pain was complained of in the afternoons—which was relieved by the injection of 1/100 grain of Atropine Sulphate.

On the 26th afternoon pain and distension of the abdomen were very great—the patient looked ill with sunken eyes—T. 100—P. 98—R. 26.

An injection of 10,000 units of A. D. Serum was given followed by the oral administration of A. D. bacteriophage 2cc third hourly.

That very night the character of the motions changed and became liquid, dark greenish brown and very offensive—a great deal of flatus was passed. The bacteriophage was continued for a few more days—the attacks of pain were reduced in number and severity—and the tem-

perature did not rise above 99°—the pulse rate ranged between 80 and 88 p. m.

The abdominal distension gradually subsided—and by the 1st of February the patient was free from pain.

But in spite of very carefully regulated diet the motions remained liquid and very offensive. Drugs such as Bismuth—Mist Creta, Tannalbin and Dover's powder and Kaolin were tried—but these made no difference.

As the general abdominal distension subsided a more definite thickening was felt along the line of the transverse and descending colon—On February 20th a very definite lump was felt in the left iliac fossa and a rectal examination revealed a ballooning of the lower part of rectum with a bulging into it of the intestine from above.

On February 21st Dr. Miss. H. M. Lazarus F.R.C.S.E., opened the abdomen, by a right paramedian incision inches long.

There was an intussusception of the ileocaecal valve into the colon, the apex lay low down in the rectum. The intussusception was easily reduced by gently pushing on the apex—The color of the invaginated intestine was normal—and the blood supply good. The caecum was very mobile.

The mesentery of the caecum was transferred to the right side with four interrupted catgut sutures. The peritoneal cavity was closed and the abdominal wall stitched in two layers.

The patient made an uneventful recovery.

Association and Service Notes.

The Annual General meeting of the Association was held on the 12th February 1936. The following members were then declared elected to constitute the Executive Committee of the Madras Medical Association.

President.

Dr. A. Lakshmanaswami Mudaliar.

Vice-Presidents.

Dr. P. Venkatagiri.
„ C. Abbu.

Members.

Dr. P. V. Cherian.
„ J. C. David.
„ G. Dinker Rao.
„ M. R. Guruswami Mudaliar.
„ A. S. Mannadi Nayar,
„ S. Ramakrishnan.
„ A. Srinivasalu Naidu.
„ S. K. Sundaram.
„ S. Thambiah.

The newly elected Executive Committee met on the 2nd March 1936 and appointed the following office bearers:

Secretaries.

Dr. S. Ramakrishnan,
„ S. K. Sundaram.

Treasurer.

Dr. P. V. Cherian.

Editor of the Madras Medical Journal.

Dr. J. C. David.

Members of the Editorial Committee.

Dr. (Miss) A. B. Hardy.
„ P. Kutumbiah.
„ N. Mangesh Kao.
„ M. B. Prabhu.
„ A. Srinivasalu Naidu.

Secretary to the Editorial Committee.

Dr. S. K. Sundaram.

Members have from time to time been informed and have, where necessary been supplied with copies of representations made on their behalf.

It is proposed to refresh the memory of members with a brief resumé of work done and the representations made to the authorities on behalf of the Association.

A number of memoranda were submitted to the Surgeon General in 1931—32 and a deputation waited on the Government regarding retrenchment. It was very regrettable that it was beyond the Association to prevent the sudden retrenchment of 14 members in 1931. They have all been fortunately re-entertained now. In every representation on retrenchment however the Executive have never failed to lay stress on the protection of the interests of the then discharged officers in any further measure of retrenchment.

On all questions of importance the Executive have made repeated representations and have had

individual memorials submitted by all officers on the reduction of civil surgeons' cadre, and the new scales of pay and special pay. In January 1935 the Executive arranged for a deputation to wait on the Surgeon General and presented a representation on all outstanding service grievances. The deputation was fortunate in enlisting the sympathy and support of the Surgeon General on practically all the questions that were discussed. (G. O. No. 3154, P. H. dated 6th December 1936), copy of which would appear to have been circulated to all assistant surgeons, does not deal with the questions as they were raised. It is therefore proposed to give an abstract of the points submitted, the orders of Government on them and further action taken by the Executive.

I. (a) Future reduction of the cadre of the Madras Medical Service, whether as a measure of retrenchment or not, should not prejudicially affect the interests of members in service at the time, including the officers retrenched then awaiting re-employment. Government have noted the request for consideration.

The leave reserve of the General branch should not be abolished. The matter is under the consideration of the Government.

II. The New scales of pay as introduced in G. O. No. 311, Public (Services) dated 13th April 1933, should not operate against the existing assistant surgeons either on promotion as civil surgeons or on transfer to the Bacteriology department. The G. O. of the 13th

April 1933 not only reduced the scale of pay all round but also degraded seven teaching appointments from civil surgeons' to civil assistant surgeons grade. Government have turned down the claim for the old scale of pay on promotion or on transfer, but have not yet passed final orders on the restorations to their original rank of the seven degraded appointments. The Executive Committee still adhere to their original view and have accordingly submitted a petition to the Governor-General in Council.

III. Study leave with study allowances as under Fundamental Rules should be resumed as early as possible. Pending such resumption, ordinary leave out of India, as under F. R. 90 should not be subject to any restrictions re: age, service, etc., except the discretions in individual cases of the leave granting authority. Members are aware that Government have in the meantime released the restrictions on minimum leave (out of India) salary but have not been pleased to liberalise the conditions re: age and service as requested.

IV. The anomaly of civil assistant surgeons holding civil surgeons posts in the grade of civil assistant surgeon should be removed. The matter is said to be under the consideration of Government.

V. Confidential reports on civil surgeons in teaching institutions should be written by the Surgeon General himself and not by the head of the institution. The Surgeon General himself would not agree to this and Government have turned down the request too.

VI. Abolition or reduction of special pays should not affect

existing officers. Government have rejected this claim. The Committee feel that their case is strong and have accordingly raised this question in the petition to the Governor General-in-Council referred to above.

VII. Permanent vacancies in this service should be filled as early as possible. About 7 vacancies in the teaching line remain substantively unfilled for years. The deputation pleaded that some arrangement must be made by means of which these vacancies should be extended, at least provisionally, to approved probationers. This question is still under consideration. The service rules provide for confirmation of approved probationers at the earliest opportunity, with retrospective effect if a vacancy existed.

VIII. Re-entertainment of discharged officers against sanctioned vacancies should be as prompt as their discharge was. Leave reserve was for leave vacancies, not to provide for permanent vacancies. Delay by some weeks had occurred in re-entertainment. Government have been unable to appreciate the justice of this request for recognition by them of their moral obligations to make as immediate bundobust for re-entertainment as for discharge. The question however has ceased to be of practical interest.

IX. The women's section of the service should have their prospects improved by transferring to the service the post of Superintendent of the Caste and Gosha Hospital now reserved for W. M. S. I. The deputation did not ask that new civil surgeoncies should be created

to provide for the promotion of women assistant surgeons as civil surgeons. Government have refused to create such new appointments.

It was also submitted that women assistant surgeons under the new scale of pay should be given the same scale of increment as men assistant surgeons. The new scale for women is 175-20/2-275-25/2-400 and for men 175-25/2-400. Government have not complied with this request.

X. The deputation finally pleaded for the right for the Association of previous consultation in all matters and policy affecting the service.

A petition has now been submitted to the Governor General-in-Council on the 16th March 1936. Members will in due course have copies of the petition circulated to them. They will then be in a position to appreciate what case the Committee have made out for them.

NOTICES Etc.

Zondek-Ascheim Test.

We are asked to announce that the above laboratory test for the diagnosis of pregnancy in the early weeks is done in the Government Hospital for Women and Children, Egmore, Madras. All medical practitioners who wish to have this test carried out for any of their cases many have it done at the Govt. Hospital for Women and Children, Madras. A nominal fee of Rs. 5 will be charged per case. It is now recognised that this is the most reliable laboratory test for the diagnosis of pregnancy in the early weeks.

Gleanings from Current Literature.

Treatment of Enlarged Prostate with Male Hormone (*Lancet*, 22-2-1936, Page 439).—The thesis that some kind of endocrine dysfunction is responsible for benign enlargement of the prostate has attracted much attention from experimentalists in recent months. The general opinion is that the hyperplasia is a response elicited by oestrogen compounds, but McCullagh and Lower, McCullagh, D. R.: (*Cleveland Clin Quart*, January, 1936 P. 3.) elaborate a contrary view that it results from imbalance between two separate normal testicular hormones, secreted by the seminiferous tubules and by the interstitial cells. It will be recalled that Dr. Paul Niehans accepted this view in his paper recommending treatment by "Steinach's ligature II"; but it must be admitted that the evidence in favour of the existence of two such hormones is still somewhat indirect. Gonadectomy in both male and female rats leads to enlargement of the pituitary and to enhancement of its gonadotropic powers. If two rats, the one castrated the other normal, are experimentally combined in parabiotic union, the accessory reproductive organs of the normal animal become hypertrophic, presumably because its gonads are stimulated by the excess of gonadotropic hormone elaborated by the castrated animal's pituitary. If, however, enough male hormone is injected into the castrated animal to save its prostate from hypertrophy, its pituitary does not become over-active, and the accessory repro-

ductive organs of the normal member of the parabiotic pair, do not enlarge. These observations show that testicular hormone influences both the accessory reproductive organs and the pituitary, and the presumption is that whole its effect on the pituitary is an inhibitory one.

McCullagh argues that two distinct substances, with sharply different functions, are responsible for these separate effects. This opinion is founded chiefly on changes observed after irradiation of rats' testes with X rays. Such irradiation leads to degeneration of the tubular elements, while the interstitial tissue remains normal and the accessory reproductive organs hypertrophy. The pituitaries of the irradiated animals also become over-active, in the same way as the pituitaries of castrated animals. Thus a single experimental procedure enhances one testicular function (promotion of growth of the accessory organs) and depresses another (inhibition of pituitary hyperactivity). Indications of similar differential changes in testicular function are provided by other experiments, and McCullagh therefore concludes that the interstitial tissue of the testis elaborates a hormone which governs the well-being of the accessory reproductive organs while the tubular system produces a hormone which prevents the pituitary from becoming gonadotropically hyperactive. As he himself points out much remains to be done, not only in the provi-

sion of new data, but also in the confirmation of older findings and in the resolution of conflicting observations, before this hypothesis can be regarded as sound. Despite these uncertainties, however, McCullagh and Lower advance the following conception of the aetiology of benign enlargement of the prostate. The condition, they suggest, is due to insufficient production by the testes of a hormone—to which they give the name "inhibin"—which normally prevents the hypophysis from secreting too much of its gonadotropic principle, and to a consequent hypophyseal over-activity which stimulates excessive production of the testicular hormone concerned with the growth and maintenance of the accessory reproductive organs, including the prostate. If this view of the aetiology of enlarged prostate is correct, the obvious treatment for the condition is administration of the testicular substance "inhibin." This substance, however, has never been isolated; and accordingly, in his investigation of 76 patients, Lower had, to compromise by giving each the equivalent of 60 grammes of fresh beef testicular material daily. Some of the patients at the beginning of the trial suffered from complete retention of urine, while others had nocturnal frequency and varying amounts of residual urine. Nevertheless as many as 48 reacted favourably, the improvement of symptoms being usually manifest within a week or ten days after treatment was started, and the maximum being reached within 4-6 weeks. But unfortunately the improvement was almost entirely symptomatic, for the size of the

prostate, as determined by rectal examination, had as a rule not altered, nor had any histological changes been induced.

Although he does not favour it, Lower is alive to the possibility that his therapy may actually have been an unimportant factor in the symptomatic improvement of his patients. This is undoubtedly the safe view to take in the absence of any knowledge of the efficacy of crude testicular extracts when given by mouth. In any case, even assuming that the treatment was of value, it is obvious that the material administered may have been useful not because of its problematical inclusion of a substance "inhibin," but because of the male hormone proper which it almost certainly contained. The aetiological hypothesis postulated by McCullagh and Lower is in no way supported by whatever success their treatment may have gained, since male hormone is also indicated in the management of benign enlargement of the prostate on the view that the condition results from the prolonged activity of oestrogens. It is idle, however, to speculate, in the present state of knowledge, on these various issues. One thing only is plain. Several hypotheses regarding the aetiology of enlarged prostate have implied that male hormone would be of use in the treatment of the condition. Information about the chemistry and biology of male hormone compounds has also multiplied rapidly in the past year. It is time, therefore, that male hormone was given a fair and adequate clinical trial in those conditions which experimental work suggests may benefit from its use.

Histidine Treatment of Peptic Ulcer (*Lancet*, Jan. 11 1936).—Mann and Williamson (1919) found that if the duodenal secretions of dogs are diverted into the lower end of the ileum the animals soon develop peptic ulcers like those of human beings and severe nutritional disturbance leading to death in a few weeks. Aron of Strasbourg repeating these experiments in 1933 reported that of five animals thus operated on two died with ulcers where as the other three which had received histidine and tryptophane injections showed no ulcerations at all. These injections were given in the belief that the development of ulcers in the dogs was in some way due to amino acid deficiency resulting from the surgical interference with protein digestion. Further work led Aron to apply his theory to the treatment of peptic ulcer in man, and using intramuscular injections of a 4 per cent solution of histidine hydrochloride—prepared by *Hoffmann-laRoche* under the name of *Larostidine*—he reported very good results in 17 cases. Since this paper was published 80 other records of the use of histidine have been published in various countries. The advocates of this treatment claimed that it largely, if not wholly, takes the place of diet, alkalies and rest in bed. Histidine treatment differs from other treatment advocated for peptic ulcer in that it is based upon the view that peptic ulcer is at least partly a deficiency disease and that the injection of this amino acid will correct part of this deficiency. It does not appear probable that the diet of the patient who afterwards gets peptic ulcer is consistently deficient in protein—in fact many are normally big meat eaters

—and if such deficiency arises thro' faulty digestion or absorption of proteins no case for the failure is known. The effects of drastic interference with the digestive secretions of dogs cannot be applied to man without reserve, and the rationale of histidine treatment requires further support. Judgment of its value must therefore depend largely on clinical experience.

The dose recommended is 5 cc of a 4 per cent solution of histidine hydrochloride given daily by intramuscular injection for a period up to three or four weeks and repeated as required. There are said to be no dangers, the patients need not be kept on a restricted diet, alkalies are unnecessary and rest in bed is usually not required. Relief from symptoms follows as a rule in 2 to 6 days. Some 60 to 90 per cent of cures are recorded. But as most workers have pointed out it is too early to assess the value of this treatment. Disappointing relapses are already known and as Izar (1935) points out histidine is not a specific cure for peptic ulcer, in the sense that it will counteract the cause. If this is so it is unwise to relax attention to diet and other general measures of treatment. The longest case—histories reported hitherto are less than two years, and the word 'cure' is therefore inappropriate to any of them. At the same time the many accounts of relief of symptoms, increase in weight and well being, and removal of clinical and radiographic evidence of active ulceration point to the treatment being in some way beneficial. But the time is not yet come for accepting an entirely new theory of ulcer causation and for abandoning the ordinary rules of diet and management.

Urinary disinfection (*B. M. J.* Dec. 7 1935).—Ketogenic diet was introduced by Clark etc. in 1931 and there has been abundant proof of its efficacy. The bacteriostatic agent in ketogenic diet is B-hydroxybutyric acid in the urine. But this acid when given by the mouth is completely oxidised before reaching the urine.

Attempts therefore have been made to find a related non toxic acid which would exert a similar bacteriostatic effect without being oxidised when given orally and which would be excreted unchanged in the urine. It was recently been claimed that MANDELIC ACID, $C_6H_5CHOHCOOH$, fulfills these requirements and that when given in 12 gram doses daily and the urine rendered strongly acid by ammonium chloride it forms an effective substitute for the more cumbersome ketogenic diet treatment. The drug is best given as the Sodium salt as in the following prescription:—

R		
Mandelic Acid	gr. 45	
Soda Bicarb	gr. 21	
Syrup Aurantii	dr. 1	
Aquam	ad	Oz i.
		Oz i. 4 times daily.

Appropriate doses of ammonium chloride are given to maintain a urinary pH below 5.5. Six cachets each containing 10 grs. were found sufficient per day to attain the desired acidity. The fluid intake is limited in order to ensure a strong concentration in the urine of the mandelic acid. Cases have now been reported of chronic cystitis of several years' duration which have been cured by this simple treatment.

Ordinary pus forming organisms, B. Coli etc., are killed by this treatment.

Treatment of Circulatory failure in Pneumonia—(Abstracted from a report of a lecture by W. H. Wynn in *B. M. J.*, Jan. 11-1936). At the first indication of cyanosis oxygen should be administered. When an oxygen tent is available this should be used, but in most cases it will be administered through a nasal catheter. The cylinder should have a calibrated reducing valve, and two litres per minute passed. When oxygen is required it should be given day and night, and not for so many minutes in each hour or when the nurse thinks fit. One still sees it administered by the futile method of waving a funnel over the patient's face. I am reminded of a remark of a distinguished physiologist that it is as useless to expect to increase the pressure of the oxygen in the alveolar air by administering it through a funnel as to expect to alter the salinity of the ocean by emptying the bladder into it!

With circulatory failure the drug *par excellence* is *adrenaline*. It augments the heart's contraction, constricts blood vessels, and raises blood pressure: 5 to 10 minims can be injected every four hours, increasing, if necessary, to two hourly. *Pituitrin* has no action on the heart, but stimulates contraction of the smaller arterioles and capillaries. It can be used to augment the action of adrenaline—1 cc. every twelve hours, or not more often than every six hours. With both these drugs the point may have been reached when toxic action upon the capilla-

ries has advanced so far as to make them incapable of response. They should be employed at the first sign of failure and it must be recognised that with great toxæmia we may be wholly powerless to combat circulatory failure.

The use of *Digitalis* in Pneumonia has been the subject of much controversy. It was for long out of fashion, and its revival is due to the advocacy in America of its early use in full doses with the idea that if the heart was digitalised early its failure may be prevented. This was due to misconception of the nature of circulatory failure. *Digitalis* has been used to slow the heart, and also with the vague idea that it is a cardiac tonic and therefore must be of value in heart failure. But there is abundant clinical evidence that *digitalis* does not slow the heart in pneumonia.

Its reputation depends almost entirely upon its power of depressing the function of the conducting tissues, a very desirable property in auricular fibrillation but surely not desirable in pneumonia, where we should aim at preserving the normal functions of the heart. From clinical statistics available from American sources it has been shown that for every 100 patients in the control group who died, there were 122 deaths in the *digitalis*-treated group.

Alcohol has probably for long been the most used of all drugs in pneumonia. While it still has its supporters, opposition appears to be growing. In the early stages, it may by its sedative action allay anxiety and promote sleep, but

morphine will do this more effectively. The argument that it is a source of energy has not much weight when so easily assimilable a food as glucose is available. But the chief discussion is concerning its use in circulatory failure. Its reputation as a cardiac stimulant probably arose from its familiar use as a remedy for fainting. The effect on the circulation then is due to reflex action from its irritant effect upon the upper part of the alimentary canal. But this action is fleeting, and it does not follow that the same effect will be produced in gradual circulatory failure in acute fevers. When prescribed in pneumonia in the usual way of so many ounces of brandy every four hours or so, it is its action after absorption which must be considered. Experiments on animals and man show that it has no directed action on heart. But it causes some redistribution of blood. There is dilatation of peripheral blood vessels, flushing of the skin, and therefore a smaller supply for internal organs. *Alcohol* is therefore likely to accentuate the peripheral circulatory failure. There is no doubt that much of the delirium and excitement attributed to pneumonia was actually produced by the *alcohol* given for treatment, and in my early days as a physician, it was not uncommon to see *alcohol* urged for the treatment of active delirium, which was entirely the result of the *alcohol* the patient had already received. With the smaller doses now used severe delirium is less often met with.

Strychnine was frequently prescribed in the past but it is rather out of favour at present. It also

has no direct action on the heart, but is a central vasomotor and respiratory stimulant. It fails to act in toxic depression of the centre or in cases of cerebral paralysis of the vessels.

Many other drugs have been advocated for their action upon the circulation, but mostly with the idea that the heart was primarily at fault. They may have some value in some cases but I have not found one which is of real value in saving life in serious circulatory failure.

Spinal Anaesthesia (LEO DOYLE --*B.M.J.*, Jan. 4, 1926).—The author believes in premedication which in addition to allaying fears in the patient overcomes the tendency to nausea, which is a feature of spinal anaesthesia. The average doses of the drugs given for this are *morphine* 1/6 gr. and *hyoscine* 1/150 gr. Rectal paraldehyde is also sometimes given. The spinal anaesthetic used is novocaine which is put up in ampoules as sterile crystals by the Anglo-French Drug Co., and labelled '*Neocaine*'. The strengths are 10, 12, 15 and 20 cg. The lumbar puncture having been made, 2 cc. of the spinal fluid is withdrawn. A plug is placed on the needle to prevent the further flow of fluid and the crystals in the ampoule are dissolved in the spinal fluid. When solution is complete the fluid is injected back into the spinal dura. As a rule 1 cc. is injected, the cerebro spinal fluid is again withdrawn into the syringe to 3 cc. and the whole finally injected. The lumbar puncture needle is then withdrawn, and through the same skin spot same ephedrine, (up to 0.5

grain) is injected into the lumbar muscles. The patient is then made to lie down and is turned over on to his back, if he were injected lying on his side, he is immediately placed in a slight or moderate Trendelenburg position. The operation may begin after about five minutes. Occasionally the patient will be able to feel touch but not pain. For perineal operations, haemorrhoids, and cystoscopy he uses 10 cg. injected quite slowly below the fifth lumbar spine.

For operations on the inguinal region he gives 12 cg. into the fourth space; for appendicectomies, 12 cg. into the third space; and when he desires complete anaesthesia, 15 cg. into the second space.

An occasional headache that follows may be cured by placing the patient in the Trendelenburg position for a few hours.

Cod-liver Oil in Treatment of Wounds (STEEL, *Lancet*, 1935, 229, 290).—Dressings of lint saturated with crude codliver oil simply covered with a layer of jaconette, have been used with general success for the treatment of burns, suppurating wounds, and other lesions. The dressing is not removed for forty-eight hours, but at the end of twenty-four hours or more often if necessary, it is resoaked with oil. In some cases, at the end of a week, granulations are found to be exuberant. The codliver oil dressing is then replaced for twenty-four hours by zinc lotion, or a paste with a zinc basis. Ease is obtained with the first dressing; the abolition of frequent change of dressing is a

great advantage; healing is rapid and there is an almost total absence of scar tissue. The brown pigmentation found in the healed skin rapidly clears up without further treatment. It is not established what constituent of codliver oil has this marked beneficial and healing action, which is not observed with liquid paraffin and other oily dressings.

Anaesthetics, Oil soluble, in Rectal Surgery (MORGAN, B. M. J. 1935, ii, 938). The author describes the use of a solution in almond oil of procaine base 1.5 per cent butyl para-aminobenzoate 6 per cent. and benzyl alcohol 5 per cent. As much as 30 mls. are injected into the tissues around the rectum preparatory to the treatment of fissure in ano, to remove the irritation of pruritus ani and for various minor rectal operations. Anaesthesia is almost immediate and lasts for periods varying from seven to twenty-eight days. The toxicity of the solution has been shown by pharmacological experiment to be very low, the average lethal dose for mice of 20 G weight being 0.3 mil. The solution is marketed under the name of 'Proctocaine'.

Ether-Oil Rectal Analgesia. GWATHMEY and MCCORMICK (in J. A. M. A., 21-12-1935) describe their modern technique in obtaining analgesia in obstetrics with ether-oil administered through the rectum. The formula for the mixture now used is 2½ ounces of ether, 20 grs, alkaloidal quinine, 45 minims of alcohol, 2 drachms of paraldehyde, and paraffin or olive oil to make up the four ounces. The quinine is first dissolved in alcohol, and the paraldehyde, ether and oil are

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subsequently added in this order; the mixture is then stirred, strained through cotton, bottled and corked. With the specially devised apparatus this mixture can be instilled easily within half a minute. Nembutol is used as the basal anaesthetic. In a long series of cases no maternal or infantile mortality has been attributed to the use of this method. It served as a satisfactory analgesic in 85 to 95 per cent of cases, and most failures are due to faulty technique. It can be started early in the first stage or at any other time during labour; the patient is much more co-operative than in 'twilight sleep' or sodium amytal analgesia. The mixture also induces a satisfactory measure of amnesia, and the average instillation remains effective for two to six hours. It does not prolong labour as a rule and usually the second stage is shortened. No ill effects are produced on the mother or the child; forceps deliveries are decreased in number. Lacerations are no more frequent than with other methods of delivery. It fits in well with gas inhalation anaesthesia during the perineal stage, but chloroform must never be given in conjunction with it.

Congo Red in Typhoid Haemorrhage (SZIRMAI, *Munch. Med. Wchschr.*, 1935, 1403)—Congo red has been used with success in preventing intestinal haemorrhage in typhoid fever. If blood appears in the faeces the author gives 10 mls. of a 1 per cent. solution by intravenous injection, repeated every twelve or twenty-four hours till the bleeding stops. Injection into the muscles is not successful,

Gleanings from Current Literature

In a review of certain recent contributions on **PROGRESS IN INTERNAL MEDICINE under Diseases of Metabolism and nutrition** RUSSEL M. WILDER and DWIGHT L. WILBUR of Rochester, Minn. (A. I. M. 55: 2, Feb 35, 304) summarise *Progress in the study of Metabolism of carbohydrate as controlled by the anterior pituitary and suprarenal bodies*. Contrainsular hormone (Lucke), or the blood sugar-raising hormone is formed in the anterior lobe of the pituitary body. The substance has not been identified chemically, but it possesses unmistakable biologic properties. It is certainly not identical with the gonadotropic and thyrotropic hormones, but thus far it has been separated from the growth hormone. It is distinguished from the pituitary hormone of fat metabolism of Anselmino and Hoffmann by filtration. It is secreted into the cerebrospinal fluid and under special conditions can be demonstrated biologically in the fluid. Its immediate action is on the sugar centres in the brain stem. Consequently it is ineffective when these centres are neutralized by pharmacologic means (or destroyed by experimental lesions?). In turn, under the influence of the hormone, the brain centres activate the suprarenal glands, the stimulation passing from the centres to the suprarenal glands by way of the sympathetic nervous system. For this reason, the action of the pituitary hormone is interrupted by pharmacologic (ergotamine, barbituric acid derivatives, general narcosis) or mechanical inhibition of the respective sympathetic nerve fibres as well as by extirpation of the suprarenal glands. The thyroid

gland is not involved. The end effect, elevation of the level of the blood sugar, is a result of the release of epinephrin, but the anterior lobe of the pituitary body, and not the suprarenal glands, is the regulator; the liver with its store of glycogen occupies the centre of the stage as the effector organ. The possibility of nervous inhibition of the mechanism of the pancreas for the production of insulin, which would result in hyperglycaemia, is ruled out in Houssay's experiments by the activity of the hormone in the absence of the pancreas.

Possible application of these observations in the treatment of diabetes are: surgical removal of one suprarenal body produces no evidence of suprarenal insufficiency and therefore can be of no significance therapeutically. Bilateral sympathectomy is out of question because of fatal consequences. Ergotamine depresses blood sugar in diabetic patients, but in doses too near the range of toxicity (Cesa-Bianchi and Moretti). Denervation of the suprarenal glands has a favourable influence in partial diabetes in animals (Ciminata, Takats and Cuthbert). Bilateral splanchnic section in animals (Rupp) and in cases of diabetes in man (de Takats and Fenn) exaggerate the effect of insulin and are encouraging. Denervation of the liver alone does not influence the tolerance for dextrose (de Takats, Donald). In spite of the association of acromegaly and diabetes, Von Noorden considered the existence of a type of diabetes caused by a pituitary disturbance which is independent of disease or of abnormality of the insular system was

highly improbable. There is no evidence to incriminate the pituitary body in cases of diabetes unassociated with acromegaly. Changes in the pituitary in diabetics when present, have not been demonstrated to be primary. Whether the course of diabetes can be modified by measures directed toward suppressing the activity of the pituitary body remains to be seen. Hutton's claim for intensive roentgen irradiation of the pituitary body has not been confirmed. Administration of oestrogenic substance in large doses suppresses the activity of the anterior pituitary in animals, but clinical reports are not available and are not free from risk in our present state of knowledge. Complete suppression of the pituitary might be followed by the atrophy of other organs, notably the suprarenal cortex.

Heredity in diabetes: Potentiality for developing diabetes is inherited as a mendelian recessive (Pincus and White, Joslin Diabetic Unit). The number of offspring with diabetes in 23 conjugal families and the age at onset have been correctly predicted. When both the parents are diabetic all the children are predestined to have diabetes. If a diabetic marries a carrier of potentiality for diabetes $\frac{1}{2}$ the offspring are predestined. If a carrier marries a carrier, $\frac{1}{4}$. If a diabetic marries a non-diabetic, none.

The influence of magnesium, as reported by Hans Franke of Breslau, in promoting marked glycogenesis, even when administered with adrenalin, is astonishing.

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Diabetes Mellitus, its differentiation into Insulin-Sensitive and Insulin-Insensitive types: H. M. HIMSWORTH, Dy Director of the Medical Unit, University Medical College Medical School, London, ex-Beit Memorial Research Fellow (*Lancet*, 18-1-36, 127.).—Two different types of disease can be distinguished as causing the symptom complex of diabetes mellitus. One, the insulin-sensitive, appears to be caused by deficiency of insulin, is acute in onset, is more common in the young and lends itself to high CH diet, for like the normal individual the insulin-sensitive diabetic react to the increased amount of dietary CH by becoming more sensitive to insulin.

The other type, the insulin-insensitive, is apparently due not to lack of insulin, but to lack of an unknown factor which sensitises the body to insulin, is insidious in onset, often discovered fortuitously, is more common in but not confined to the elderly, will not tolerate high CH diet because of the inability to react to increase in dietary CH by increase in sensitivity to insulin.

A test to differentiate the two types is worked out: Blood sugar estimations are done on capillary and venous blood to test the tolerance to glucose alone and with simultaneous insulin (given intravenously; the glucose being given by mouth without nausea and faintness being present at the time; 30 g of glucose and 5 units of insulin per sq. m. of body surface in the tests reported). Precautions other than to ensure absorption from the stomach of glucose are: all patients must be receiving approximately the same

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amount of CH in their diet, as insulin sensitivity of a normal subject depends on the CH utilized; excessive loss of sugar in the urine should be guarded against; conditions must be basal as exercise will affect the test.

The capillary venous blood difference (the A. V. difference) after glucose alone is considerably augmented by insulin in normal subjects, and insulin-sensitive diabetics but not in insulin-insensitive patients; showing that in the normal individual and in the insulin-sensitive diabetic insulin promotes storage of glucose in the peripheral tissues while it is unable to exert its action of effecting the transference of sugar from the blood to the peripheral tissues in the insulin-insensitive patient.

The insulin-sensitising factor is suggested as an activator of insulin. Whether it is a definite substance or a condition of the tissues in general which facilitates the action of insulin is not definitely known.

Tuberculosis Survey of the U.S.A. J. A. M. A. cv: 23 (7-12-35), 1855—1916.—A tuberculosis survey for 1933 in 1934 made by the Council of Medical Education and Hospitals of the A.M.A. for the U.S.A.—covering 471 tuberculosis hospitals and sanatoriums, 740 tuberculosis departments of hospitals and 29 preventoriums,—shows that 95,198 beds are available for tuberculosis patients throughout the states for a total mortality amounting to 74,564 in 1933 (of which only 21.7 per cent occurred in institutions). Construction planned or in progress will add another 6,661 beds. Of 67,021

adults, 7.5 per cent were reported as "arrested," 9.8 per cent as "apparently arrested," 11.6 per cent as "quiescent," 30 per cent "improved," 17.2 per cent "unimproved," and 23.9 per cent died.

The ratio of physicians to patients varied from 1:28 to 1:70.

The total replacement value (land, buildings, equipment) approximated to 330,000,000 dollars, representing an average of 3,455.30 dollars per bed. The annual cost of tuberculosis hospitalization exceeds 70 million dollars, average cost per patient per day is 2.37 dollars in a sanatorium, 2.95 dollars in a tuberculosis department, and 1.39 dollars in a preventorium.

In sanatoriums there is a nursing staff of 7,370, exclusive of attendants (of whom 4,258 are graduates), for an average daily census of 56,325, patients.

Of 601 institutions, comprising 471 sanatoriums, 101 tuberculosis departments and 29 preventoriums, 47 obtain part or all of their income from the federal government, 170 receive state funds, 294 county funds, 105 city support, 24 receive income from fraternal organizations, 8 from industrial agencies, 52 from endowments, 104 from gifts, 254 are supported in part or entirely by pay patients.

Of 290 tax supported and 130 private institutions, representing a total of 81,583 patients (70,078 in tax supported and 11,505 in private institutions), 84.4 per cent receive free treatment, 9.2 per cent pay in part, 6.4 per cent pay full rates. In private institutions, of 11,505, 4,964

received free care, 2,863 were part pay, 3,678 paid in full.

The average daily census is approx. 82,000. The average stay in sanatoriums was 166 days, in tuberculosis depts 101 days.

Of the 95,198 total beds, 64,997 were in sanatoriums, 28,534 in tuberculosis depts, 1,667 in preventorium.

121,706 patients were admitted during a 12 month period, and 118,700 discharged.

In 1910 the mortality of respy tuberculosis was 136 per hundred thousand, and for other forms 24.3. In 1932, 56.4 and 6.4 respectively.

Of 89,237 patients, 86.1 per cent were tuberculous, 9.1 per cent non-tuberculous, 4.8 per cent were unclassified. Of the tuberculous 87 per cent were pulmonary, 8.7 per cent childhood type, 4.3 per cent non-pulmonary.

The uses and abuses of modern gland products in gynæcological disorders by EMIL NOVAK (before the 86th Atlantic session of the A.M.A. 1935, in *J.A.M.A.* 105: 9, 31/8/35, 662.) Following "the brilliant results of thyroid feeding in cases of thyroid hypofunction it is appalling to think how many billions of ovarian tablets had to be ingested before the profession was convinced of the inefficacy of the method..... That there is still a vogue for this form of treatment is an excellent illustration of the painful slowness with which new knowledge permeates professional practice..... While the cold truth is that all these older

preparations for oral administration are entirely or almost entirely inert, the person who believes they are no longer used, or that there are no longer doctors with pencils which reflexly write for ovarian tablets at the mere mention of any functional disorder, would believe that there are no longer people who carry horse-chestnuts in their pockets to ward off rheumatism.

Amenorrhoea.—Endocrine treatment is definitely useful in the definitely hypothyroid cases, but of little value in the other types.

Dysmenorrhoea.—Progestin or pregnancy urine preps perhaps of some use in some cases of primary dysmenorrhea to correct the endocrinopathic defect. Far more important is it to correct the constitutional, environmental or psychogenic factors that are so often concerned.

Functional Uterine Bleeding (metropathia haemorrhagica).—Progestin substitutional, anterior pituitary-like preps from pregnancy urine helpful too (though they have no luetinizing effect in the human being). Indicated in severe bleeding very young individuals. Where there is no reason to fear cancer diagnostic preliminary curettage is not necessary. PV is always wise. In periodic bleeding, give 100 to 200 units of pregnancy urine daily for 1 to 2 to 5 or 6 days, from the onset of the bleeding. In metrorrhagia begin at once. Post pituitary extract in 0.5 to 1 cc doses will sometimes enhance their value. Nearer middle age, curette and follow up if necessary with organotherapy. In approaching menopause X-rays or radium are sensible. When there is definite

evidence of hypothyroidism, thyroid is indicated

Vasomotor Menopausal Symptoms.—Reassurance, bromides, œstrin, substitutional.

Sterility.—Endocrine factor if thyroid defect in either partner is most easily corrected. Thyroid is frequently employed even in the cerebro-hypophyse—gonadal variety. Remember in the treatment of sterility possible defect in the male, anovulatory menstruation (?) due to delicate quantitative balance between the follicle ripening and luetinizing hormones), defective germ plasma in the male as well as in the female. Improve the constitutional and endocrine status of the couple in every way; re: constitutional element, factors such as diet, psychic conditions and overwork.

Gonorrhoeal Vulvovaginitis of Children.—œstrin, recently by the vaginal route as medicated vaginal cones.

Undescended Testis.—Oestrin. Pregnancy urine.

For a discussion of reproductive endocrinology refer to Emil Novak. Some newer aspects of reproductive physiology, *Am. Journ. Obst. & Gynec.*, to be published;

Endocrine mechanisms in functional gynæcological disorders, *Surgery, Gynec. & Obst.* 60: 330 (Feb) 1935; *Gynæcological aspects of endocrinology*, *B.M.J.* 2: 553 (Sept. 23) 1933.

In the first Dixon Memorial Lecture before the section of Thera-

peutics and pharmacology of the Royal Society of Medicine on the 11th December 1935, Sir Henry Dale deals, as a fitting memorial to Dixon's interest in the actions of alkaloids and organic bases which reproduce the effects of autonomic nerves, with modern developments in this field of research. (*Proc. Roy. Soc. Med.* XXVIII, 319.)

Dixon was early interested in the suggestion that autonomic nerves transmit their effects by releasing at their endings, specific substances, which reproduce their actions. It is now generally recognised that parasympathetic effects are so transmitted by release of acetylcholine, sympathetic effects by that of a substance related to adrenaline, called "sympathin" by Cannon in two combinations representing the augmentor and the inhibitor actions of the sympathetic.

Very recent evidence indicates that acetylcholine by virtue of its other ("nicotine-like") action, also acts as transmitter of activity of synapses in autonomic ganglia, and from motor nerve to voluntary muscle.

The terms "Cholinergic" and "adrenergic" have been introduced to describe nerve fibres which transmit their actions by the release at their endings of acetylcholine and "sympathin" respectively. It was long ago known that in regeneration of peripheral efferent, afferent fibres, preganglionic fibres, sympathetic and para-sympathetic, post-ganglionic para-sympathetic and voluntary motor fibres can replace one another, but not post-ganglionic sympathetic

fibres, and vice versa. In terms of the new chemical nomenclature cholinergic can replace cholinergic fibres, and adrenergic can replace adrenergic fibres; but fibres of different chemical function cannot replace one another. The exact mode of transmission of sensory neuronic impulses, peripheral vasodilator and central, is not clearly established yet.

The bearing of this new evidence on conception of the mode of action of "neuromimetic" drugs is discussed. Pilocarpine and arecoline, quite unrelated to acetylcholine, produce a similar parasympathetic effect, and tyramine and the related ephedrine stimulated the sympathetic nerve endings. The pharmacological action can now be more clearly defined.

Annual Reports etc.

EXTRACTS FROM ANNUAL REPORT

OF

THE UNION MISSION TUBERCULOSIS SANATORIUM AROYAVARAM --1934—35.

In judging the value of sanatorium treatment one must not only examine the immediate results of the treatment at discharge but also, what is after all more important for the patient, the after-results of the treatment. It is common to hear it said that patients who have been in a sanatorium may be fairly well when they leave, but that they usually break down very rapidly some time after they have left the special care of the sanatorium. Whether this statement is true or not can only be decided by a careful investigation of the after-histories of these patients.

One of the chief factors in such an investigation is to know whether only very early cases are included, or also advanced cases, and, if both are included, the proportion between the two.

There is an idea in India, shared even by some prominent doctors,

that a tuberculosis sanatorium treats only early cases which might be cured anywhere by rest, fresh air and good food. This conception is totally out of date and is not in accordance with what is found in modern sanatoria.

During the last twenty to thirty years, all over the world, patients with the disease in the advanced stages have been admitted in steadily increasing numbers to sanatoria, because the modern sanatorium treatment has revealed the fact that it is often just in the most desperate cases that the best results are obtained.

In this Sanatorium during the last ten years we have admitted considerably more advanced cases than during the first five years.

This is seen in the following table :—

The stages of the disease in patients admitted during 1916-30.

		Patients admitted.	I Stage.	II Stage.	III Stage.
			Per cent.	Per cent.	Per cent.
1916-20	...	807	29'5	46'5	24'0
1921-25	...	737	19'8	25'6	54'6
1926-30	...	1,231	22'5	24'3	53'2

It will be seen that during the last ten years more than half the number of patients were in the third or the most advanced stage of the disease.

During the years 1916-25 there have been discharged 1,544 patients who have been away from the Sanatorium for fully five years or more in each individual case. Omitting 580 untraceable cases we find that out of 964 patients discharged, which number includes the most advanced cases, 492 or 52.0 per cent were alive after five years and that 46.5 per cent were doing full work. These figures, with the untraceable omitted, are, in spite of this omission, probably fairly correct for various reasons not given in detail here.

The results of the treatment are

Percentage of patients discharged as 'clinically well during the three five-year periods; 2,775 patients.

	I Stage.	II Stage	III Stage.
	Per cent.	Per cent.	Per cent.
1915-20	86.9	62.7	24.7
1921-25	93.1	73.6	23.1
1926-30	94.8	76.8	34.3

As the investigation has shown that improved immediate results mean improved after-results we have every reason to hope that the still further improvement of the immediate results in 1926-30 will mean corresponding increase in the number of patients living and working 5 years after discharge; this investigation will be made in 1935.

The improvement so strikingly

brought out far better by considering the fate of the patients both with regard to the different stages and to the immediate results on discharge.

This investigation has revealed that much better results were obtained among the patients treated during 1921-25 compared with those treated during 1916-20. The most striking difference is found among those discharged as 'much improved', and especially among those in II and III Stages. This is of great importance as it confirms our statistics for the immediate results on discharge. In the following table it will be seen how much better the results are year by year. The table comprises those patients who have been discharged as 'clinically well', that is to say, those who are discharged as 'arrested' and 'much improved'.

brought out in the last table is due to the modern development of sanatorium treatment. The routine in a sanatorium which has kept pace with modern discoveries and experiences in the treatment of tuberculosis, makes it an institution entirely different from the pioneering sanatoria in which the so called 'open-air treatment' was carried out. The backbone of modern sanatorium treatment is not only

fresh air, good food and other hygienic measures, but is a special treatment, carried out best under open-air conditions, consisting of a change between rest and graded exercises regulated according to the resisting power against the disease in each individual case. The regulation of this change is in a modern sanatorium not only based upon the experience gained during half a century from the observations of the clinical symptoms of the patients in relation to their rest and exercise, but is now also based upon guiding facts obtained by examination of the blood, such as the sedimentation test of the red blood corpuscles and differential counts of the white blood cells. The modern research on the immunobiological aspects of tuberculosis has not only explained why this change of rest and graded exercise constitutes the all-important basis for the whole treatment, but it has also helped to improve the treatment in many ways.

There are now also at our disposal, in a modern sanatorium, methods and remedies which in many cases give the greatest support to the sanatorium treatment proper, and often bring about the most surprising results even in the most advanced cases. These methods and remedies are Artificial Pneumothorax treatment, and other operations like Phrenic-exaeresis. Among modern remedies should be mentioned injections of various heavy-metal salts, calcium injections, and autovaccines. The old remedy, tuberculin, is of help as well in certain selected cases. To this may be added the laboratory research, making possible the treatment of complications on a

real scientific basis. This is especially necessary in the tropics.

It is worth pointing out that improvement in the results of modern sanatorium treatment is especially noticeable amongst the most advanced cases, where improvement was most needed, and thereby the real value of this treatment is demonstrated.

The investigation of the after-histories brings out one more fact, and that a most astonishing one. It shows very distinctly that the patients in the I and II Stages of the disease have practically as great a possibility of getting on well later in life whether they are discharged as 'arrested' or as 'much improved'. This is manifested most clearly when the last five-year period, 1921-25, is considered.

Nothing better demonstrates the value of sanatorium treatment than these good after-results of the treatment for the patients discharged as 'much improved', compared with those discharged as 'arrested.' Those who are discharged as 'much improved' still show signs of having the disease to a considerable extent. They have nearly always tubercle bacilli in their sputum and rales and other physical signs of the disease to be heard in their lungs at the time of discharge. They have nevertheless become 'clinically well', which is to say that they are able to be exposed to the higher degrees of graded exercises, without showing any symptoms of activity of the disease, either through the clinical symptoms or by examination of the blood. This is because they have been sufficient-

ly long under the Sanatorium treatment to have had the immunobiological defence of the body worked up to such a extent that it is able to guard them against intoxication from the foci and against the power of the tubercle bacillus to create new lesions or extend the old ones.

The whole investigation is summed up as follows:—

1. The investigation of the after-histories comprises 1,544 patients discharged during 1916-25 and who have all been discharged from the Sanatorium for a period of 5 years or more.

2. About one-fourth only of the patients were early cases while more than one-third were in the most advanced stage of the disease.

3. 1,544 patients, 580 could not be traced 5 years after discharge, but an examination of the records of these patients in relation to the stages of the disease on admission and the immediate results on discharge, compared with those of the patients traced, shows very little difference between the two groups. Judging from this the after histories of the two groups may be expected to be very similar, and therefore percentages, omitting the untraced, are in this investigation approximately correct.

4. Of the 964 patients traced, including the most advanced cases, 51.0 per cent were living 5 years after discharge, and 46.5 per cent were doing full work.

5. Examined with regard to the stages of the disease on admission of the patients to the Sanatorium the after-histories show that in I

Stage out of 257 patients traced, 214 or 83.3 per cent were living 5 years after discharge, in II Stage out of 324 patients 207 or 63.9 per cent, and in III Stage out of 383 patients 71 or 18.5 per cent.

6. Examined with regard to the immediate results of the treatment on discharge, the after-histories show that in I Stage of the patients traced among those discharged as 'arrested' not less than 87.6 per cent were living five years after, of those as 'much improved' 81.3 per cent and of those, as 'improved' 75 per cent. In II Stage the corresponding figures are 83.3, 68.8 and 50.0 per cent. In III Stage the number of 'arrested' is too small to calculate as a percentage, while of those 'much improved' 50.0 and of 'improved' 21.4 per cent were living. It should be remembered, as stated above, that practically all those who are living after 5 years are doing full work.

7. An improvement of the immediate results of treatment on discharge of the patients in the second five-year group is followed by a corresponding improvement in the after-results.

8. In the second five-year group the patients discharged as 'much improved', in the I and II Stages, have been shown to have a chance in life, 5 years after discharge, almost equally as good as that of those discharged as 'arrested' in the same stages. This was not so in the first five-year group. The difference is due to the benefit received by the second group from the later development of modern sanatorium treatment.

Current Topics from other countries.

RUSSIA

M-Pavlov—In the death of Pavlov at the age of 86 (27th February 1936) the world has lost an eminent physiologist of international reputation. He was a Nobel prize-man, having been elected to that distinction in 1904, in recognition of his researches on the functions of the digestive glands. Professor Pavlov was the recipient of numerous honours—he was foreign member of the Royal Society (1907), elected member of the Russian Academy of Sciences (1907), and Hon. Fellow of the Royal College of Physicians (1928). He was awarded the Copley medal in 1918. As director of physiological laboratories in the Russian Academy of Medicine and the Institute of Experimental Medicine, he attained world wide fame and carried out extensive investigations on the problems of digestion, of cerebral activity and the theory of reflexes

Current Science.

LONDON

The Reform of the Medical Curriculum.

The reform of the medical curriculum has been under discussion for some time. The report of a committee of the General Medical Council (*B. M. J.* 20th July 1935, p. 210) was circulated to the licensing bodies and the deans of the medical schools for their observations. As a result of the

replies a revised report has now been submitted to the council, of which the following are the main points.

Pre-registration Examinations.

Before beginning the medical curriculum proper an examination should be passed in general education, chemistry (theoretical and practical), the elementary principles of the chemical combination of elements, physics (theoretical and practical), the elementary mechanics of solids and fluids, the elements of heat, light, sound, electricity and magnetism, elementary general biology (including practical work), fundamental facts of vegetable and animal structure, life history and function, and introductory embryology. The examination in biology may taken after registration in the period of professional scientific subjects,

The Medical Curriculum.

The period of study from registration to diploma should not be less than five years. The first two years should be devoted to professional scientific subjects with an introduction to clinical subject. Throughout the whole period of study, attention should be directed to the measures by which health may be assessed and maintained and to the prevention of disease. The professional scientific subjects include dissection of the entire cadaver, anatomy of the living body,

embryology, histology, the elements of genetics, general physiology, the normal reactions of the body to injury and infection (as an introduction to general pathology and bacteriology) and the elements of normal psychology. In the second year, instruction, should be given in the methods of clinical examination, including physical signs, the stethoscope and the ophthalmoscope, the examination of body fluids and introductory pharmacology.

The Period of Clinical studies.

The period of clinical studies occupies the third to the fifth years, during which clinical instruction should be continuous. Students should not pass to this period until they have passed the examinations of the first and second years. A minimum of three years should be given to clinical study in an approved hospital. The medical training includes a clinical clerkship for six months, a continuous period of not less than a month's residence in a hospital or nearly, a clinical clerkship of not less than one month in a children's ward or hospital, regular attendance in an out-patient department for three months, regular instruction and demonstrations in applied anatomy and physiology by the teachers of those subjects as well as those of clinical subjects, instruction in therapeutics (including dietetics, prescribing, physical therapy and nursing) children's diseases and welfare, acute infections, tuberculosis, psychology, mental diseases and deficiency, dermatology, radiology and vaccination. The surgical training includes

a surgical internship for six months, during which time the student should spend the greater part of his time at the bedside and in the out-patient department, a continuous period of not less than one month's residence in a hospital, regular attendance in an out-patient department for three months, surgical methods, including physical therapy, minor operative surgery on the living, administration of anesthetics (not less than ten times), a course of operative surgery, regular instruction and demonstrations in applied anatomy and physiology by the teachers of these subjects and those of clinical subjects, disease in infancy and childhood, ophthalmology including refraction, otology, rhinology and laryngology, surgical radiology, venereal diseases, orthopedics, and dental diseases. The training in midwifery, gynecology and infant hygiene includes systematic instruction, the applied anatomy and physiology of pregnancy and labor, clinical midwifery, maternity and gynecologic practice for six months, not less than two months' residence in a maternity hospital during which the student should attend at least twenty cases under supervision, antepartum and postpartum care, and management of the puerperium and new-born infant. Pathological and bacteriological instruction includes general and special pathology (functional and structural) morbid anatomy, clinical and chemical pathology, general and clinical bacteriology, and immunology. Other subjects of instruction are pharmacology, materia medica (including practical pharmacy), hygiene and public health, forensic medicine, and the legal and ethical obligations of physi-

cians, including national health insurance and other acts of parliament. It will be noticed how exceedingly practical is the curriculum, of which many of the requirements are new.

(J. A. M. A.)

PARIS.

The Lack of Sanitation in France.

In the Concours medical, Dr. J. Noir emphasizes the shirking of their duty by the authorities in the matter of sanitation, public hygiene and simple cleanliness. For more than fifty years public education has been compulsory in France and hygiene is given a prominent place in every school. But the people remain about as ignorant in hygiene and sanitation as in past centuries. An example would have to be given by the administrations, which in France are under Government control. Consider the buildings in the prefecture of the Seine or in any bureau in France. They sometimes are dilapidated and too often nobody worries about cleanliness; the result is awful. In a lot of Government buildings, for instance, the duty of cleaning the windows is entrusted to two different departments: the outside to some ministry, the inside to the local authority. The result is that when one side is clean the other is dirty.

The ministry of public health, about which the hygienists indulged in beautiful dreams, is a portfolio to be given to some politician, who will be superseded by another one, equally inadequate, when he begins to learn something about his job. Only one of the ministers of public

health has been a physician or some other competent person since the creation of this ministry.

Dr. Georges Schreiber, in the bulletin of the Parti social de la sante publique, points out that the public health law of 1902 is without virtue, because the mayors who are in charge of it do not worry about it. In Paris, where the police should take more pains to enforcing the law, nobody cares; the simpler regulations, such as forbidding the exposure of eatable goods to dust, and the obligation to wrap bread and fruit, are neglected. The food may be pawed over by anybody, and the flies may help themselves first; anybody may spit on the ground. The police never arrest any one or, if they do, the intervention of some alderman releases the offender.

Some departments, directly under the control of authorities and managed by technicians, are better. For instance, the inspection of meat or milk, in the slaughter houses or dairies. In some cases, private initiative has succeeded in bettering the conditions of a whole sanitary department; of Touring Club, for instance, exerts good control over the country hotels, and the automobile associations have made tolerable the policing of the roads. But, on the whole, one can hardly hope for a great advance in general sanitation in France except by the education of the public, which is a long and hard task.

(J. A. M. A.)

Nota Bene.

The journal has entered, let us hope, on a new lease of life. It requires the support of all our members. Its columns are open to the publication of interesting clinical memoranda, results of original work and observations, and extracts from other journals which are bound to be of interest to the readers.

The association in recent years has deserved well of its members. No stone has remained unturned to stem the tide of retrenchment which has come like a tidal wave over our unsuspecting heads. Money has been spent on circulars, letters and the printing of memorials to the local Government and to the Viceroy. Therefore your financial aid is as important as your moral support.

The president's foreword needs no seconder. But as editor, may I also raise my feeble voice in entreating all fellow members of our service to sink personal differences for a common cause and one and all support the association and the journal.

The Secretary and Treasurer would be much gratified if every one of our members who receives a copy of this number promptly sends back a cheque or money order of Rupees five being the annual subscription.

The next number of the journal will be published by the 15th of July and MSS for publication may be sent to the Editor, Department of Pharmacology, Medical College, Madras, until the 15th June 1936.

—J. C. D.

The
Madras Medical Journal

THE OFFICIAL JOURNAL OF THE MADRAS MEDICAL ASSOCIATION.

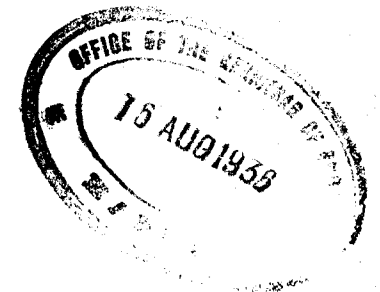
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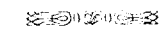
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Haemorrhage after removal of Tonsils*

By

P. V. CHERIAN, M.B.B.S., F.R.C.S.E., F.R.F.P.S.G., D.L.O.

I have chosen haemorrhage after removal of tonsils as my subject for to-day's lecture. That it is a very important subject can be realised from the numerous articles written on the subject and also from the various instruments designed to arrest the bleeding. But it is satisfactory to know that the percentage of people who bleed after complete tonsillectomy is infinitesimal compared to the number of tonsils removed. The general public and even some members of the medical profession have an idea that operation for removal of tonsils is a minor one without danger. This is due to two facts:

(1) First, only very few cases of bleeding are reported.

(2) Secondly, operations for removal of tonsils has reached such an efficient standard at the present time that bleeding is very rare.

Still, no surgeon worth his name performs tonsillectomy without having all appliances ready to meet the emergency. It is important to bear in mind that no patient should be allowed to leave the table before the tonsillar beds are dry and free from haemorrhage. Haemorrhage from tonsillar beds should be treated just like haemorrhage in any other part of the body—arterial, venous, or ordinary oozing. Haemorrhage must have been very common before the advent of the present methods of complete removal of tonsils, *i.e.*, during the days when tonsillotomy or partial removal of the tonsils was practised instead of tonsillectomy. Morel

* University Extension Lecture—January, 1936.

Mackenzie himself records only one case where haemorrhage endangered life. Several eminent authors have recorded fatal results from haemorrhage. H. W. Lock reported 332 cases of death after operations on the nose and throat which were previously unreported. Of these, 43 occurred from haemorrhage after tonsillectomy and two after removal of adenoids. It should however be borne in mind that careful pre-operative preparation and post-operative care would reduce the risk of haemorrhage to the absolute minimum. No case of fatal haemorrhage occurred in my wards though a few cases have bled enough to cause alarm. I have never yet encountered a case of uncontrollable haemorrhage.

In this connection, there is only one case worth recording from my wards. This was a young boy aged 16 in whom tonsils were enucleated by dissection. Patient left the table dry but towards the evening bleeding commenced. Clamps were applied first. This did not stop bleeding. On the next day the patient was put on the table and the pillars were stitched together over a pad of gauze. This was removed after 24 hours. But bleeding started again and the pillars had to be stitched over again. This too did not stop bleeding and the patient was very weak and was in an alarming state. Bleeding stopped only after my colleague Dr. N. Mangesh Rao did a blood transfusion for him. I mentioned this case specially as it is the only one in my experience of over 10,000 cases that defied all the usual methods of arresting haemorrhage. Haemorrhage is apparently more

frequent when sharp instruments are used, e.g., when a sharp guillotine is used haemorrhage is more frequent than in the use of a blunt one. Many operators contend that haemorrhage is less in removal with the guillotine than in enucleation by dissection. There may be some truth in this but then it is completely over-shadowed by the fact that in dissection bleeding is very much better brought under control. Here I am afraid I will have to digress a bit and say a few words in favour of enucleation by dissection specially the method I practice. I can see no other way where the operator can get as good a view of the pharynx as by use of Boyle Davies gag. The gag is fixed with Negusis Jack. Light is reflected into the mouth from the head mirror and the operator behind the head of the patient. Here the operator is able to follow every step of the operation and the minutest bleeding point can be secured and ligated. It is only on very very rare occasions that I have been called to see a case that has bled later. This is not the case when the guillotine is used. Here it is almost a blind operation. It is very difficult to pick out the bleeding points and the surgeon unless he is also well versed in the dissection method has to depend on ordinary pressure to stop the bleeding. In my view removal by dissection is a method of choice, and it seems to me that it is pure luck that there are not more cases of haemorrhage after the use of the guillotine. Absence of haemorrhage also to a great extent depends on the technique of the operation and the skill or otherwise of the operator.

Classification of Haemorrhage.

This may be *primary*, *reactionary* which is in the great majority of cases continuation of the primary haemorrhage which has been overlooked specially when the guillotine has been used and occurring a few hours after operation and *secondary* taking place sometime later. Some people get repeated attacks during the first few days. This is exceedingly rare. Secondary haemorrhage occurring a few days after the operation from the separation of the slough is very rare. I have not come across a case yet. The pre-disposing causes for haemorrhage are:

- (1) Want of pre operative preparation.
- (2) Operating on tonsils when inflamed.
- (3) Age, usually young adults especially females bleed more than children.
- (4) Menstrual periods, pregnancy and menopause.
- (5) Fibrous tonsils. Here from the excessive amount of the fibrous tissue the blood vessels do not contract properly after removal as in normal cases and give rise to haemorrhage.
- (6) Alcoholism, Nephritis and Syphilis.
- (7) Suppuration as in quinsy, anaemia, leukaemia, cardiac diseases, renal diseases, haemophilia, benign and malignant tumours and finally irregular distribution of blood vessels.

The exciting cause is really clumsy manipulation in inexperienced hands. If the muscular bed of the tonsil is damaged or too much tissue is removed it naturally leads to haemorrhage. Exertion too soon after operation also may give rise to bleeding. This bleeding however can be avoided by paying careful attention to the selection of cases and then preparation. Several things can be done before operation to stop bleeding. My practice generally is to give a dram of *calcium lactate* in three doses the previous day. The difference in bleeding is remarkable in those who have taken calcium and those who have not. By taking calcium the coagulation period is considerably diminished. *Adrenalin* may be used but here after its effect passes off there is a tendency to secondary haemorrhage. *Pituitrin* is a very efficient drug 1 to 2 c. c. may be injected hypodermically about half an hour before operation. This considerably diminishes the coagulation time and is a very satisfactory method. The tonsil itself may be used to arrest bleeding. The tonsil tissue has a thromboplastic action. So after removal of tonsil it may be replaced into its fossa and held there firmly for about two minutes. Tonsil extract also has the same action. Even human serum may be used. 15 c. c. intravenously or 20 to 40 c. c. subcutaneously. Horse serum can also be used. The effect comes on in 24 to 48 hours and lasts for about 3 weeks. Another material used is *coagulose* which is in powder form and can be used on the surface or dissolved and injected. *Haemoplastin* is very useful as its maximum effect is reached from 1 to

2 hours. Bovine serum is also useful.

Arresting Haemorrhage during operation.

Majority of them stop spontaneously in a few minutes. If it does not and the bleeding continues profusely the bleeding points should be looked for and ligated. Haemorrhage occurring sometime after operation. Here again the bleeding should first be stopped by applying pressure with plain gauze or a gauze soaked in turpentine. If this does not stop it the bleeding point should be ligated. But if the bleeding point cannot be found the pillars should be sutured. But the most troublesome bleeding is the general oozing that takes place in some cases. Here no bleeding points can be seen and the bleeding in some cases is fatal. This may be controlled by ordinary pressure or a haemostatic clamp. It must however be said that it causes great discomfort and distress to the patient and the retching and the coughing may cause bleeding from the opposite tonsillar bed. It is really unsurgical and old fashioned and its use can only be justified as a very temporary method till the arrival of the surgeon. To send a patient from the theatre to the ward with a clamp in the throat is not surgery. There are again a very few cases where the internal carotid artery comes too near the tonsillar bed forming a loop on itself. This can never be injured in the careful dissection method which is a great advantage this method has over the use of guillotine. In any case it must be acknowledged that according to the present day

method of removing tonsils by dissection bleeding can be completely controlled and the patient can leave the theatre with the throat practically dry. It is a good plan in cases of post-operative haemorrhage to give an injection of morphia and atropine, the dose varying with the age of the patient. This controls the nervous excitement of the patients, reduces blood pressure and prevents vomiting. Good number of cases stopped bleeding with this treatment. Other methods are the injection of calcium, adrenalin, pituitrin, sera etc. It seems to me that there is a feeling that ligation of the common carotid may arrest uncontrollable bleeding. This is not so, due to the marked collateral circulation through the circle of Willis. Then again it is a much more serious operation than the removal of tonsils and need not be done at all. I must sum up by mentioning a few points by adhering to which risk of post-operative bleeding can be reduced to the absolute minimum.

(1) Cases in which operation is contra-indicated due to general condition should not be operated on.

(2) No patient should be operated on unless in a hospital or nursing home. This operation should be done in a private house only when all the conveniences are available to meet any emergency.

(3) Careful pre operative preparation, e.g., administration of calcium, etc.

(4) The Co-operation of Expert anaesthetist. According to Irwin Moore, in no operation are the services of an expert anaesthetist of a

greater value and the success of the operation and the question of haemorrhage may be in no small way dependent on his skill.

(5) Adoption of methods by which haemorrhage can be stopped before the patient leaves the table.

(a) Position of the patient at operation *i.e.*, recumbent extended head position and the wet Boyle Davis gag. This gives the best view of the tonsillar fossae, and all bleeding can be controlled.

(b) Skilful operation avoiding damage to pillars of the fauces and musculature of the tonsil bed.

(c) Use of blunt instruments in preference to sharp ones.

(d) Ligaturing all bleeding points. Some surgeons as a routine measure even temporarily stitch the pillars together.

(e) And finally very careful post-operative treatment is essential. The patient should be under very careful supervision for some time.

He should be kept in bed in the lateral position. So that if any bleeding does occur it will flow out of the mouth. It is also advisable to keep the mouth open with a gag between the teeth. This would keep the mouth open and prevent swallowing. Expectoration should be prevented as it may disturb the clots in the tonsillar fossae and start bleeding. If the patient is very restless on recovering from the anaesthetic an injection of morphia should be given. From the experience gained by several specialists and handed down to us, from the large number and the variety of instruments at our disposal and from the easiest and satisfactory way of completely removing the tonsils we are not only enabled to remove any type of tonsils, but we are able to prevent and control haemorrhage both at the time of operation and afterwards. Removal of tonsils is a safe and popular operation now and the key note of our work should be to choose our cases properly and do the operation skilfully.

Percain in Spinal Anaesthesia

By

CAPTAIN D. K. NARAYANA RAO, M.B. (CAL.), A.I.R.O.

Spinal anaesthesia is used all over the world and is being increasingly employed in large hospitals in India. Its introduction in smaller institutions in the Presidency where there is only one Medical Officer with inadequate staff and no trained anaesthetists, will be a step in the right direction. Many drugs have been employed for this purpose like Stovain, Novocain, Pantocain and others. My experience with Percain in this hospital for over 18 months is the only excuse for writing an article on the subject.

Chemistry.—Percain is a quino-line derivative—(Butyloxy-Cinchonic acid diethyl-ethylene diamide hydrochloride).

It is readily soluble in water, stands boiling well and can be combined with Adrenaline with advantage. It has got a specific action on sensory nerves in concentrations which do not injure the surrounding tissues. The anaesthetic action lasts for a considerably long time and is not permanent. It has however got a fairly high toxicity even in low concentrations, demanding proper care in the preparation, dosage and choice of cases.

The two alarming dangers associated with it are: Respiratory and Cardiac failures. Respiratory failure brought about by an over dosage or

injudicious choice of case is difficult to overcome by CO₂ or other respiratory stimulants. Artificial respiration is the only way of overcoming this danger and must be persisted in. Fortunately this is not of common occurrence and occurred only once in my series of 82 cases. Cardiac failure is due to high concentrations of the drug reaching the myocardium. This may be due to accident, e.g., injection of the solution into a small vein when giving intradural injection or due to the rapid absorption of the drug injected into the Spinal canal. Hence it is imperative to see that injection of the fluid into the theca is not done until and unless clear C. S. fluid flows in a steady stream and only high dilutions of 1 in 1,000 or 1,500 are used. If proper care is taken with regard to these details, this danger need not be dreaded.

Blood Pressure.—The chief and constant feature in common with other Spinal anaesthetics like Novocain etc., is the fall in the Blood Pressure. This is due to its depressent action on sympathetic roots, causing dilatation of blood vessels. This can be counteracted by drugs like Adrenalin and Ephedrine. I, therefore, invariably give 1 tablet of Ephedrine, 10 minutes after the spinal injection and there has been no trouble afterwards.

Percain in Spinal Anaesthesia

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Preparation of the solution.—I use two strengths of Percain—1 in 1,000 and 1 in 1,500 in 0.5 per cent of chemically pure Sod. Chloride in freshly prepared double distilled water as ordinary tap water may contain some alkali, which precipitates percain. It should for the same reason be stored in non-alkaline Jena flasks. Percain is sold in ampoules ready for use but we make our own solutions from the powder, which is more economical. Stock solutions are said to keep well indefinitely but after 10 days some fungus growth is usually seen. This can be remedied by boiling and fitting the containers with rubber stoppers. The specific gravity of the solution thus made is somewhere about 1.003—much lighter than that of C.S. fluid whose Sp. Gr. varies from 1.006 to 1.008. Gravitational diffusion does not take place with these light solutions as with heavy ones. A column of anaesthetic fluid bathes a definite length of the spinal roots limited in proportion to the volume injected and by virtue of its dilution and low Sp. Gr. there is no upward spread towards the neck to involve the phrenic roots nor any toxic effects due to absorption into general circulation.

Proper technique.—I follow the method of Howard Jones. Patients are made to lie in the right lateral position, with the thighs flexed and drawn well into the abdomen and the head also bent, so as to get the back well arched and spaces between the spines well defined. The site of the injection is previously prepared and covered with sterilised dressings. A subcutaneous injection of Novocain is given and a sharp, short-bevelled rustless needle

is introduced into the appropriate site depending upon the nature of the operation and the stillette withdrawn. C. S. fluid will flow in a steady continuous stream, if the needle is in the Subarachnoid space. The syringe with Percain Sol. is then attached and injection given slowly taking about 4 seconds for each c.c. injected. The patient is then put in the prone position and the table placed in a slight Trendelenburgh position, say for 5 minutes. As the solution is lighter it floats up and de-sensitises the posterior nerve roots. The patient is then turned on to his back and allowed to remain so throughout the operation with the head a little lower than the buttock. In about 10 minutes the required anaesthesia and relaxation are obtained. The level of analgesia is tested by applying a towel clip at various levels till the patients winces.

Dose.—Dosage according to Howard Jones is ascertained by measuring the spine from the 6th C. V. to the mid point of intercrural line in inches and deducting 4 in the case of males and 6 in the case of females. The figure thus arrived represents the correct dosage in c.cs. In India, however, a larger margin is to be made on account of poorer physique and lowered vitality. 6 and 8 will be the proper deductions. In my practice, I have noticed that 6 to 8 c.cs. of 1 in 1,000 solution for operations below the Umbilicus and 10 to 12 c.cs. of 1 in 1,500 for abdominal cases work quite satisfactorily without any toxic symptoms.

The immediate effects of injection on the patient:

1. A feeling of warmth.
2. Numbness of the lower extremities extending to the trunk and relief of pain specially in hernia and obstruction cases.
3. Heaviness of the limbs with inability to move them.
4. Nausea, thirst and a feeling of suffocation.

To combat these :—

1. Application of cold round the face and neck ;
2. Encouraging the patient to breathe deeply ;
3. Increasing Trendelenberg position.

Nausea and a large fall in Blood Pressure were particularly in evidence when stomach and intestines were handled but disappeared soon after relieving the tension.

Percain was used in 82 cases which are tabulated as follows :—

Strangulated Hernia	...	15
Ordinary Ing. Hernia	...	27
Hydrocele	...	11
Appendicitis	...	1
Piles	...	1
Fistula in Ano	...	1
Gastro Jejunostomy	...	3
Stricture urethra	...	1
Cancer Penis	...	3
Elephantoid scrotum & penis...	...	12
Laporatomy (tubes, obstn., vol- vulus)	...	4
Faecal Fistula	...	1
Perineorrhaphy	...	2
Total	...	82

Ages : 19 to 60 years.

Complications.—In none of these cases was there any respiratory or cardiac failure. The fall of blood pressure was a constant feature, though mild in many cases, the fall varying between 20 to 30 m.m. There were no deaths.

The only sequela was headache lasting from a few hours to a day or two, which was relieved by A. P. C. powders. Patients complain of inability to lift the limbs ; but this lasts on an average from 4 to 6 hours. Patients after returning to bed are placed with the head low and the foot of the bed raised for 6 hours after which they are placed in the horizontal.

Conclusion.—In spite of its toxicity even in high dilutions and depressing influence on the respiratory and circulatory systems, I am of opinion that with a judicious choice of cases excluding those of extremes of age, cardio vascular disorders like myocarditis, V. D. H., arterio-sclerosis, high degrees of anaemia, which are distinct contraindications, and with proper care as regards dosage and correct technique, Percain is a powerful and satisfactory spinal anaesthetic, superior to Novocain.

I should like to express my sincere thanks to my chief, Captain J. S. MacMillan, I.M.S., Superintendent, Government Headquarters Hospital, Cocanada, who kindly permitted me to use Percain in the hospital and contribute this article to the Madras Medical Journal.

Pyelitis in Children

By

DR. M. B. PRABHU, M.D., M.R.C.P. (ED.) M.M. (LOND.)

Pyelitis may occur in adults or children. It is more common in the latter. Though frequent in childhood, it is often overlooked. This is because the symptoms do not often suggest involvement of the urinary system. Sometimes the picture is one of irregular fever—continuous, remittent and attended with rigors and the case is mistaken for malaria. In my experience, a larger number come with fever and persistent diarrhoea suggesting enteritis. Respiratory symptoms may be dominant the case appearing one of influenza or capillary bronchitis. Occasionally the nervous symptoms may suggest the case to be one of meningitis, only few cases are seen with a history of fever and burning sensation and pain on micturition.

The affection is more common in females than males. The affection may reach the pelvis of kidney in one of the following ways either an ascending infection from the urethra, or a blood infection, or a spread of infection from the bowels direct or *via* lymphatics or a descending infection from the kidneys.

Diagnosis.—Pyelitis will not be missed if systematic urine examination be made in every case, particularly when there is fever. Fresh specimen should always be examined and in girls, a catheterised specimen may be necessary.

The naked eye appearance of urine is suggestive and this useful point should never be overlooked. Urine is slightly turbid and opalescent and does not clear on standing. It has a fishy odour. This odour is not often present.

Reaction is acid. On testing for albumen there is generally a slight or moderate amount.

It is the microscopic examination that clinches the diagnosis. If the centrifuge deposit is examined, pus cells appear all over the field and very few casts or epithelial cells.

Treatment.—The broad lines of treatment are given in all the books. In actual practice these are likely to fail as certain important details are either overlooked or just given a passing mention with the result that the treatment becomes disappointing.

The line of treatment is as follows :—

A. Rest in bed.

B. Non-irritating diet—Glucose water, orange juice, barley water. Sago or rice congee are also be administered.

C. Intestinal antiseptics—calomel in fractional doses may be administered.

D. Drugs to combat the infection in the pelvis. In the very large majority of cases, the organism responsible is B-Coli Communis. This does not thrive in alkaline media hence alkalies are administered in the first instance. The essential thing for success is to give sufficient alkalies to make the urine alkaline and to 'maintain' it alkaline. Prescribing alkalies 3 or 4 times a day is nearly useless. They have to be administered every 2 to 3 hrs. day and night until the urine remains constantly alkaline, each specimen of urine being examined with litmus paper to see its reaction. Then in 24 to 48 hours there is marked amelioration of symptoms. The alkalies are continued in smaller doses but just sufficient to

keep the urine alkaline for a few days more. Afterwards hexamine is administered as an urinary antiseptic preceded by acid-sodium phosphate. This is continued for a few days. Alternate administration of alkalies and hexamine is sufficient in the majority of cases. Other urinary antiseptics like pyridium or neotropine and caprokol are useful in resistant cases.

Auto-vaccine is useful in the chronic types. More recently Ketagenic diet has been advocated in cases of pyelitis. Diet consists largely of fats the proportion of fats to carbohydrate being about 5 : 1. Children get sick on a diet like this hence this treatment is not suitable in childhood.

On Hypnotics

By

J. CHRISTDOSS DAVID, M.B.B.S., PH. D.

A hypnotic might be defined as a narcotic drug used to enable the patient to get sleep which is due to him and desired by him. If we know the causes that prevent natural sleep, the removal of such obstacles may be all that is necessary to cure insomnia. The factors that ordinarily prevent sleep are pain, and mental and emotional excitement, such as worry or grief. Pain is relieved by anodynes, like morphine and the removal of this cause helps natural sleep to occur. Mental and emotional excitement are relieved by moderate doses of a narcotic drug, big enough merely to make the mind less active. A particular case of the latter is the dread of not sleeping. But if the patient believes that his doctor has it in his power to give him some sleep-producing drug, then the mere administration of anything under the guise of a hypnotic is enough to remove the dread. If this fear of not sleeping occurs constantly, night after night, sleep fails to come and then a new habit—the *no-sleep habit* is learned. Often the conflict between the two possible outcomes (sleep or no sleep) is so acute that a condition of general reflex instability is produced (neurasthenia). Under these conditions the original sleep habit is not readily learnt again except by going back to nursery days, *i.e.*, bringing the adult back to the life of a child as far as possible; in other words, carrying out a rest cure. Hypnotics therefore act in one of four ways:—

(i) By relieving pain, (ii) by permitting sleep to occur—sedative doses of narcotics—the SLEEP PERMITTERS, (iii) by restoring hope—the PLACEBOS and (iv) by inducing narcosis—the SLEEP COMPELLERS—which are used to break down the 'No-sleep' habit. Large doses are necessary.

The demand for a reliable hypnotic is great, because insomnia is a common complaint, and hence the enterprise of organic chemists has flooded the market with several hundreds of compounds of this class. The general properties of these compounds are similar but minor differences are important in the case of drugs like these, which are given frequently and require to be given in doses sufficient to produce a definite physiological reaction. An ideal hypnotic must satisfy certain criteria. It must be capable of producing a reliable hypnotic effect and it must do this without any preliminary excitement. No irritation of the stomach or gut must be caused and absorption must be easy and constant so that the hypnotic effect follows at a regular interval after the administration of the drug. Dangerous side actions on circulation or respiration must

not be caused. The drug must be broken down in the body and detoxicated so that cumulation does not occur. Tolerance should not be produced and a habit should not be induced. There must be a sufficient margin of safety between the dose required to produce hypnosis and that which produces medullary depression.

No drug exists with these qualities but they are all claimed for each hypnotic as it appears and only after some years are the disadvantages of the drug discovered, by which time fresh compounds have been placed on the market.

It might be convenient to classify the more important hypnotics before considering their action. They fall into two main groups :—

1. *The Pain Killers* like Opium, and the Coal-tar analgesics and

2. *Those that do not relieve pain* :—These may be considered under certain heads :—

i. Alcohol.

ii. The Halogens.—Chloral Hydrate, etc.

iii. The Sulphones :—Sulphonal, etc.

iv. Urea chain compounds :—Carbromal or Adalin, Urethane.

v. Barbituric Acid derivatives :—Barbitone, Phenobarbitone, Amytal, Evipan etc.

vi. Aldehydes :—Paraldehyde.

vii. Depressants of Motor functions as well :—Bromides, Mg.

viii. Deliriant Alkaloids :—Hyoscine and similar alkaloids.

Alcohol.—Ethyl alcohol is the chief ingredient in intoxicating beverages which are commonly taken as 'Pick-me-ups' and as incentives of social intercourse or of jobs to be done. In the absence of these incentives, the preliminary stage of apparent stimulation may be wanting or completely absent and then the drug acts as a hypnotic. This effect is obtained with ease proportionate to the patient's previous abstinence and this must be remembered when prescribing. It is no better than other hypnotics but as Micks aptly states : "It scores by its psychological appeal. The strict teetotaler persuaded to take a mild night cap is so certain that it will knock him out, that he immediately composes himself to a safe and discreet sleep. The respectable old lady ordered to take a glass of whisky for the first time in her life takes such a guilty pride in the experiment that her mind is wandering in phantasies which border on sleep almost before the potion has been swallowed. A drug is often taken with the gloomy apprehension that it will fail and so it does fail; but if the draught is an alcoholic beverage, everybody knows that the spirits first make you drunk and then put you to sleep." One must not forget that if too much of alcohol is given in acute diseases like pneumonia, it might itself induce delirium.

Chloral Hydrate.—Acetaldehyde, CH_3CHO has some hypnotic effect but introduction of Cl in the molecule intensifies the effect.

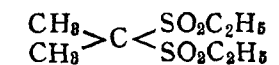
CCl_3CHO . H_2O is chloral hydrate. This is a somewhat volatile and

deliquescent crystalline compound which breaks down in alkaline solutions with the formation of chloroform. But no such decomposition takes place in the human body. It was first introduced into medicine as early as 1868 as hypnotic and naturally its drawbacks and dangers are very well known. Text books usually print warnings that chloral hydrate is a particularly dangerous drug in cases of heart disease. But it has not been actually demonstrated that chloral hydrate is any more toxic in full doses to the heart or vasomotor centres than any of the other narcotic drugs. It must be realised that all narcotics are dangerous to patients with heart disease of any kind, for in these cases a slight depression of the respiratory centre is much more serious than in normal cases, since depression of respiration means shortage of oxygen in the blood and this would lead to inefficient nutrition of an already diseased heart. As Micks says "All narcotics are perfectly safe in patients with weak hearts or heart disease until the point is reached where they exert their full narcotic action and then a slight increase in the dose which might not affect a normal individual is just enough to stop the action of the respiratory centre in the debilitated."

Chloral hydrate sleep comes on peacefully and unpleasant after effects are absent. Since it is broken down in the body into urochloralic acid and excreted in the urine, persistence of action is not seen as in the case of some of the barbiturates. Chloral is absorbed rapidly and so is an excellent and mild hypnotic in the usual doses. It acts better in combina-

tion with opium and bromides and this is a favourite prescription. It is one of the best and safest sedatives to give to a child, for example in infantile convulsions, and to stop the squalling of a teething baby. An effective and safe dose in a healthy child is 1 gr. for each year of its age. Idiosyncrasy sometimes occurs and so it should not be used in full narcotic doses and it is better not to exceed the pharmacopoeial dose. The safety margin is also variable. It is an irritant and should not be given in concentrated solution. Intense congestion of the stomach was a marked feature in a fatal case of poisoning which occurred in the Madras General Hospital. The production of a chloral habit must not be lost sight of. Chopra mentions the habit of adulterating alcoholic beverages with chloral hydrate which is becoming more or less widespread in North India.

Sulphonal.—The sulphones are derived from CH_4 by the displacement of H by alkyl or alkyl-sulphone groups. Sulphonal has the formula :



The hypnotic action is connected with the ethyl radicles and is further enhanced by replacing the remaining methyl radicles by ethyl, (one replaced in Trional and both in Tetronal).

The sulphones were first introduced in 1888. They are little used now-a-days. They have no advantages over other surer and safer hypnotics. Their action is slow and comes on irregularly. The excretion also being slow, cumulation may occur. Fatty degenera-

tion of the liver and haematoporphyria are changes observed. Sulphonal owing to its slow action may conceivably be used in insomnia of old age where the subject goes to sleep normally but wakes up in the middle of the night and cannot sleep anymore. In such cases a dose of sulphonal taken at bed time may induce effect at the time when the person is liable to get his sleep broken.

Urea Chain Compounds.—Urea is not hypnotic but it was suggested that by a rearrangement of the atoms a group with narcotic effects might be produced. The formula for urea is usually written

$\text{CO} < \begin{smallmatrix} \text{NH}_2 \\ \text{NH}_2 \end{smallmatrix}$. The chain compounds are formed by replacing one of the NH_2 groups. These are generally feeble in action with a wide margin of safety and being broken down in the body to urea are free from toxic effects.

Carbromal or Adalin is an example and is chemically bromoethyl-butyl-carbamide. It is a white tasteless insoluble powder. The bromide ion does not take part in the hypnotic action. So it cannot be used for the same purpose as bromides. It may be given about half an hour before retiring and is a mild hypnotic.

Hedonal or methyl-propyl carpinal urethane is more powerful. Both are given in dose of 15 to 30 grs.

Experience with members of the urea group has been rather disappointing, and with other types of hypnotics now available their clinical use has but little justification.

The Bromocarbamides like *Carbromal* and *Bromural* are rather mild and ineffective sedatives and hypnotics. They possess practically no analgesic effect and they act very similarly to the bromides.

Barbituric Acid Derivatives.—This series was discovered and introduced by Nebenthan in 1896.

Urea is commonly written $\text{CO} < \begin{smallmatrix} \text{NH}_2 \\ \text{NH}_2 \end{smallmatrix}$. Malonic Acid is $\text{CH}_2 < \begin{smallmatrix} \text{COOH} \\ \text{COOH} \end{smallmatrix}$. Malonyl $\text{CH}_2 < \begin{smallmatrix} \text{CO} \\ \text{CO} \end{smallmatrix}$ is the acyl radicle of malonic acid. It cannot exist by itself, but enters into compounds just as the acetyl radicle forms compounds. Barbituric acid or Malonyl urea is written: $\text{CO} < \begin{smallmatrix} \text{NH-CO} & \text{H} \\ \text{NH-CO} & \text{H} \end{smallmatrix}$

the malonyl radicle replacing a H atom in each of the NH_2 groups. The studies of Fischer and Von Mehring in 1903 established that while barbituric acid is physiologically inert the substance obtained by replacement of the two hydrogen atoms by ethyl radicles is a powerful hypnotic in animals and man. Since the introduction of Ethyl barbituric acid or *Veronal* a long series of barbituric acid derivatives has been prepared by substitution with various side chains. These have been marketed under various trade names. About 60 barbiturates are known but it is possible to create 1225, each containing no more than 6 carbon atoms in a radicle. The potency and duration of action are largely affected by the length of these side chains; and as these

On Hypnotics

drugs are rendered inert by the oxidation of their side chains, it follows that the least stable of these produce hypnosis of the shortest duration. The following table taken from Mutch indicates the relationship between trade names, chemical composition and structure. For obvious reasons only the more com-

mon and important ones are listed here:—

Table—(Mutch. B. M. J. 1934,319)
The Relationship Between Trade Names, Chemical Composition and Chemical Structure of the Barbituric Acid Group.

Allurate (in Allonal)	Allyl Isopropyl Barbiturate	C_6H_7 C_3H_5 C_3H_9 >B
Amytal	Iso amyl Ethyl B.	C_2H_5 C_2H_5 >B
Barbitonum	Diethyl B.	C_2H_5 C_2H_5 >B
Butobarbital	Butylethyl B. (Soneryl, Neonal)	C_4H_9 C_2H_5 C_2H_5 >B
Dial	Diallyl B	C_3H_5 C_3H_5 >B
Evipan	N—Methyl C.C. Cyclohexenyl Methyl B.	C_6H_9 CH_3 >B
Ipral	Calcium Ethyl, Isopropyl B.	C_2H_5 C_3H_7 Ca >B
Luminal	Phenyl Ethyl B (Gardenal)	C_6H_5 C_2H_5 >B
Nembutal	Na. Ethyl Isomethylbutyl B. (Pentobarbital)	C_4H_9 (CH_3) C_2H_5 Na >B
Pernocton	Na. Butyl Bromallyl B.	C_4H_9 $\text{C}_3\text{H}_4\text{Br}$ Na >B
Phanodorn	Cyclohexenyl Ethyl B.	C_6H_9 C_2H_5 >B
Prominal	N—Methyl Ethyl Phenyl B.	C_6H_5 C_2H_5 CH_3 >B

(While the barbiturates are generally either poorly soluble or insoluble in water their sodium compounds are very soluble).

In general the mode of action of all the barbiturates is the same, and the duration of sleep depends primarily on the so-called essential elimination of the hypnotic. This elimination, in turn, is determined mainly by the fixation of the barbiturate by the tissues, by the destruction of the drug within the body, and by the rate of excretion. On the whole, barbiturates with alkyl radicle are relatively stable compounds, while barbiturates with complex cyclic radicles, such as *Evipan*, become unstable and are easily decomposed within the body; hence the persistence of effect of these compounds is independent of excretion through the liver or kidneys. Hence the barbiturates can be classified according to the persistence of effect into the *Stable*-slowly decomposing and exerting a prolonged effect, like, *Veronal*, *Luminal* and *Dial*; and the *Unstable* like *Evipan*, *Amytal*, *Nembutal* etc., quickly decomposing and having a short lived effect. When a massive hypnotic dose is administered to the rat, the animal will sleep for about four hours after nembutal, five hours after pernocton, six to thirty hours after amytal, eighteen or twenty-four hours after luminal, dial and allurate, and eighteen to thirty-six hours after barbital (Barlow *et al* 1931).

The detailed mechanism of action of the barbiturates on the central nervous system, although widely investigated, is not adequately known. The greatest concentration of the barbiturates is found in the

diencephalon, especially the thalamus, in contrast to the cerebral hemispheres. This is of particular significance in the phenomenon of sleep. The barbiturates are at their best in the treatment of insomnia, for the restlessness of insanity, to reduce worry and apprehension and to obtain a tranquil state of mind and they are especially useful when other hypnotics, such as chloral are contraindicated, as in fatty heart. They are not truly analgesics but when mixed with usual analgesics each augments the other's action. A hypnotic dose is followed by dreamless sleep which varies in length according to the side chain contained in the derivative as already indicated. The patient wakes up refreshed but some lassitude may persist.

All barbiturates are antidote to strychnine and cocaine and are sometimes given with procaine as a protective measure and to increase the analgesic effect.

The excretion is mainly in the urine. After small doses repeated, as much as 90 per cent. has been recovered from the urine but with larger doses the percentage decreases to about 59 per cent. of the amount given. In the case of the stable ones, elimination is slow and may extend over a period of 10 days and individual tolerance may be explained by rate of elimination. In a general way, compounds which are effective in small doses are excreted rapidly and have a shorter period of action. Those whose side chains are oxidised quickly are destroyed so rapidly that the duration of their action does not depend on their excretion.

Barbiturates do not cause the development of tolerance even after prolonged use and hence the necessity never to go beyond the ordinary dosage. Habit formation does take place but is not identical with morphine habit. Patients may crave the further use of the drug and psychic disturbance may follow but no untoward symptoms result from withdrawal. A natural idiosyncrasy to the drug is present sometimes in high strung, nervously hypersensitive individuals. They may complain the day after, of symptoms of lassitude, confusion, dull headache, vertigo, a heavy sensation over the eyes, visual disturbances; and at times emotional difficulties get accentuated. These occur less commonly with the unstable derivatives. Sometime myalgic or arthritic pains may be complained of. Allergic reactions may also develop in certain cases, specially with those with a tendency to asthma etc.

As a result of slow accumulation of the drug, subjective or objective nervous manifestation may appear. The most common of these is a gradual loss of ambition, impairment of capacity for concentration and an increasing desire to sleep especially after meals. The clinical manifestations may sometimes be more bizarre and if one did not know that the patient was taking barbiturates may be difficult to understand. Vertigo, hallucinations, impairment of the functions of the ocular muscles, tremors, paresis, changes in reflexes and appearance of pyramidal signs can further complicate the clinical picture. These manifestations closely simulate the picture of encephalitis lethargica, acute psychic depression, general

paresis, delirium tremens and cerebral vascular thrombosis. These manifestations disappear on discontinuance of the drug.

The oxidation of the compound takes place in the liver chiefly, and in disease of this organ barbiturates are dangerous and may produce profound narcosis and death. Barbiturates do not poison the liver but the liver fails to decompose the drug. Because the presence of impaired liver or kidney function, vascular disease, hyperthyroidism, diabetes, congestive heart failure and severe anaemia have a tendency to predispose to the toxic effects of the barbiturates, their use in these conditions requires special care. When a toxic dose is given intravenously death is rapid due to respiratory paralysis. When a fatal dose is taken by mouth death occurs more gradually. Death may be caused by respiratory paralysis but more frequently it is due to vasomotor collapse and secondary bronchopneumonia.

In instances of mild poisoning withdrawal of the drug is sufficient to remove the symptoms. In severe cases, gastric lavage with rather warm pink permanganate or saline solution should be done, even if treatment has been delayed because with the onset of coma absorption from stomach may be retarded. The head should be kept low in order to prevent aspiration pneumonia. Before the removal of the stomach tube 30 to 60 G. of mag. sulph. in solution may be introduced into the stomach. In view of the fact that certain phases of carbohydrate and lactic acid metabolism are disturbed, the intravenous injection of glucose with insulin has

been favoured by some. In order to increase the excitability of the central nervous system *coramin*, which exerts a powerful stimulation, particularly on the medullary centres has been advocated. But its action is fleeting. The most promising line of treatment is with *strychnine* and *ephedrine*. Phenobarbitone controls strychnine convulsions in animals and this action seems to be reversible. Ephedrine can counteract sleep and can stimulate centres in the brain stem.

The Clinical uses of the barbiturate: will depend on their persistence of effect. The long acting hypnotics like, *Veronal*, and *Luminal* are used for insomnia and the latter especially for controlling convulsive states such as epilepsy in which disease it is superior to bromides. They act as antidotes in poisoning with cocaine and procaine. Although they are not analgesics in ordinary doses, when mixed with usual analgesics each augments the other's action. Examples of such combinations are the following proprietary mixtures:—

Allonal.—Amidopyrine with allurate.

Cibalgin.—Amidopyrine with dial.

Compral.—Amidopyrine with trichlor ethyl urethane.

Veramon.—Amidopyrine with barbitone.

The popular use of such combinations has not been attended with any untoward results because the dose of the barbiturate in these mixtures is small. But cumulative

poisoning may arise since amidopyrine has a short action, but barbitone a persistent one so that if a foolish person takes a couple of tablets to relieve pain and repeats the dose in a few hours time when the effect of the amidopyrine is wearing off he may easily absorb a dangerous dose of barbitone. Moreover the amidopyrine is not without danger as in recent years many cases of fatal agranulocytosis have been reported.

In the treatment of epilepsy with *Luminal* it is better to combine treatment with bromides to start with as it occasionally happens that luminal has no marked effect on the fit incidence for the first few days of administration. In a new case the initial dose should be $1\frac{1}{2}$ gr. at night, increasing the dose to 3 gr. per day. The treatment should be kept up continuously. If for any reason it is decided to discontinue luminal this should be done gradually decreasing the dose and increasing the amount of bromides. Sudden withdrawal produces a risk of *status epilepticus* supervening. Tyler Fox (1927) found that 30 per cent. of cases of epilepsy showed permanent benefit, 33 per cent. temporary benefit, 33 per cent. were unchanged and 6 per cent. were made worse. Luminal has also been recommended for the treatment of hyperemesis gravidarum in which case Sodium luminal 3 to 5 gr. made into a suppository with cocoa butter with the addition if needed of $1\frac{1}{2}$ gr. of benzocaine to ensure complete absence of irritation may be introduced into the rectum. The effect commences in 15 to 20 minutes. (Blumenthal 1929). The treatment is best given in the even-

ings. The hypodermic injection of 3 to 6 grs. of Luminal sodium or gardenal sodium has been recommended to control the convulsions of eclampsia.

The unstable barbiturates whose action is of short duration because of the instability of their side chains are used widely nowadays as **basal narcotics**. Some are also administered intravenously as general anaesthetics. Their short lived action is an advantage when it is intended just to put one to sleep and then sleep will continue without the further action of the drug.

Nembutal is given intravenously as a basal narcotic. 7 gr. in 10 cc. at the rate of 1 cc. per minute. Injections are stopped as the patient ceases to talk incoherently and falls asleep. It may also be given by mouth in doses of $1\frac{1}{2}$ to 3 gr. coupled with morphine. 9 gr. may be given in divided doses to produce partial amnesia in labour.

Sodium Amytal.—(3—9 gr.—maximum dose 15 gr.) may be given intravenously. It is readily destroyed in the body, and drowsiness, yawning, and sleep develop while the drug is actually being delivered into the blood. About 15 gr. given before full dilatation of the os can be relied upon for painless labour.

Sodium Soneryl has similar action and is used orally as a hypnotic.

Sodium Evipan is unstable in solution and so the solution must be made afresh before injection. The action is so evanescent that it cannot be employed to procure a longish period of quiet or unconsciousness

before the administration of the main anaesthetic. It cannot be used to put the patient to sleep in his bed prior to transference to the theatre and so cannot be regarded as a good basal narcotic. But administered intravenously it is an admirable means of inducing general anaesthesia, rapid and pleasant in its action. Sometimes respiratory depression and excitement follow the narcosis. For intravenous use, a solution, 1 G. in 10 cc. of distilled water is run in at the rate of 1 cc. in 15 seconds; an average of 3 cc. produces quick unconsciousness.

These compounds can be used safely only by those who have had much experience and are familiar with the literature concerning such use. While fairly safe for minor operative procedures, their use for prolonged operations needs such care and accurate dosage that the casual user may well avoid them for such purposes.

Paraldehyde.—Paraldehyde is a polymer of acetaldehyde, $(CH_3COOH)_3$ and is the nastiest medicine there is. It is most unkind to give a helpless patient anything so nasty if there is any other hypnotic available. Its maximum effects last for so short a time that it often fails. The occasions are few in which some other pleasanter drug or combination of drugs cannot be used with greater advantage. It is rapidly absorbed taken by the mouth and is excreted mainly through the urine, also the lungs, enough to make its action short lived. With doses of 60 to 120 m. in adults the patient quite suddenly becomes unconscious 5 to 15 minutes after taking a dose. For a few minutes it is hard to wake him

and he is in a state of moderately deep narcosis but then he becomes only slightly unconscious. If he is free from pain and in need of sleep and in a dark room he may continue to sleep. Otherwise he may wake up, and be in a state of drunkenness, singing and talking wildly as after an anaesthetic. In pneumonia, paraldehyde makes the tired brain unconscious, but at the same time the toxins of the fever may readily produce delirium. When used by itself in this disease it often produces a short period of unconsciousness lasting a few minutes and then some hours' loss of self control in which the toxins of the fever taking the brain unguarded readily excites a wild delirium. Such a delirium is harmful as it increases muscular exertion and thus overworks the heart. So by itself it is unsuitable for producing rest and sleep in pneumonia. It has also been recommended in *delirium tremens*, where there is inability to sleep night after night. It acts quickly causing unconsciousness followed by the sleep of exhaustion. But it must be remembered that an alcoholic is a drug addict and even with this noxious medicine a habit may be formed. When given by rectum the absorption is slower and it is used in this way as a basal narcotic. It is used intravenously also and is safe in small operations. But this is not without danger as it may cause circulatory collapse and pulmonary oedema. It should not be used in the presence of gastric or duodenal ulcers. If used continuously it may cause severe injury to the liver.

Bromides.—The bromides produce a general depression of the central nervous system which can

be maintained for as long as desired and for this reason bromides are used in diseases such as epilepsy, where it is necessary to keep the central nervous system depressed for months or even years. The slow, continuous action of bromides is largely dependent upon the peculiar slowness of their excretion. The reason for this is that the kidneys and the body tissues are unable to distinguish between bromides and chlorides and hence bromides freely replace chlorides in the tissues and the kidneys excrete these two salts indifferently. After prolonged administration of large doses of bromides, one-fifth of the total halogen content of the tissues may consist of bromides. This replacement does not interfere with the normal behaviour of the body tissues except in the brain whose irritability is greatly reduced. Direct electrical stimulation of the motor cortex produces convulsions but after large doses of bromides this effect is lost. Hence the use of bromides in epilepsy. For this purpose large doses are taken but the salt intake having to be controlled makes the dosage rather uncertain, as an increase in the intake of common salt increases the excretion of bromides and a salt free diet causes accumulation of bromides in the body cells. So luminal with or without bromides is preferred.

As a hypnotic, bromide is not of much value by itself, as its action is limited, no matter how much is given. It is impossible to produce profound narcosis by bromides and if a gross overdose is administered, one may comfort himself with the thought that nothing worse than a deep sleep will befall the patient. Very large doses may only produce

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mental confusion without sleep. Hence it is useless for this purpose unless combined with other drugs like chloral hydrate. In patients suffering from depression or involuntary melancholia, and sometimes in febrile conditions, large or even average doses of bromides may induce further mental depression or confusion. Long continued use of bromides may also in rare cases result in disturbance of memory, ataxy, tremor, sexual impotence and cachexia. These symptoms disappear on withdrawal of the drug. The skin reactions to bromides consists in the appearance of reddish papules or of a confluent rash forming superficial carbuncle-like skin eruptions. They may involve the whole body or only the face and limbs. The skin lesions depend on the sensitisation of the skin and occur more readily if there is impairment of kidney function.

The kind of patient for whom bromide is most suitable is the excitable child. Children require but little to persuade them to go to sleep but in an adult the hypnotic action of bromides is often most disappointing. There is no significant difference in the action of the bromide salts of potassium, sodium and ammonium.

Hyoscine.—Hyoscine is used as a sedative in restless and maniacal patients. But Micks warns against its use as the drug is most untrustworthy as a narcotic even in sedative doses, as it may produce considerable excitement. Collapse from overdose is recorded and occurs suddenly. Temptation to repeat the dose in vigorous maniacal cases should be resisted strongly as in big doses it is dangerous.

Morphine.—Morphine is a narcotic, differing from the others by having a very marked effect on the perception of pain and the control of respiration. Morphine relieves pain, however severe it may be, in doses which are not markedly stupefying. But it is not constant as a hypnotic. True, a quarter of a grain will send most people to sleep, but in some cases there will be some hours of preliminary excitement which may be accompanied by distressing nausea, and on waking from the slumber induced by morphine the recipient will not necessarily feel refreshed. By itself it will give sleep to most of those who are kept awake by pain, but it is not safe to assume that it will do so in every case, and it is often necessary to prescribe some other purely narcotic drug in addition to morphine. In painful illness if the brain is excited by worry or by the toxin of the fever a mere pain killer does not necessarily prevent sleeplessness. To make a patient continually drowsy is not a common aim of therapeutics, but sometimes it may be necessary as in cases of thrombo-phlebitis of the femoral vein where the patient is best kept quiet and constipated. And opium or any of its derivatives is admirably suited for this purpose for the reason that there is no other powerful drug so constant in its action and so free from cumulative effect.

The Coal Tar Analgesics—The coal tar derivatives, namely, acetanilide and phenacetin from aniline, phenazone from phenyl hydrazine and amidopyrin which is a derivative of phenazone, as well as the salicylates and acetyl salicylic acid are sometimes used as

hypnotics in cases of insomnia due to painful conditions. These possess a very definite selective action on the pain-centre but the intensity of their action is very limited, and increasing the dose does not increase the analgesic effect.

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Some Observations On The Evolution Of The Conception, Diagnosis And Treatment Of Anaemias.

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INTRODUCTION.

There are some branches of medicine in which progress is painfully slow and others in which it is rapid beyond recognition. Except in endocrine medicine, in no other department of medicine have such rapid strides been made as in our conception, diagnosis and treatment of anaemias during the last decade. It is the object of this paper briefly to review this progress.

causes of anaemia as malaria, ankylostomiasis, chronic haemorrhage, haemolytic infections, etc. It was admitted that in certain unknown special circumstances hookworm infection or other causes which normally resulted in "secondary" anaemia could produce a "primary" anaemia. But the only recognised cause of "primary" anaemia other than pernicious anaemia was *dibothriocephalus latus* infection.

OLD CLASSIFICATION.

Anaemias were at the beginning of the decade under review broadly divided into "primary" and "secondary." The outstanding example of "primary" anaemia was Addisonian pernicious anaemia. Its outstanding characteristic was marked megalocytosis, with a colour index of over one. The other well known "primary" anaemia of the time was chlorosis. Chlorosis had however a "secondary" anaemia picture, so-called because microcytosis and hypochromia and a low C. I. were present in chlorosis, as an iron deficiency anaemia; and they were characteristic of anaemias secondary to the then recognised common

OLD DIAGNOSIS.

The usual method of diagnosis was by examination of the peripheral blood film. In doubtful cases the colour index was worked out to clinch the diagnosis. A megaloblastic anaemia was the surest proof of "primary" anaemia. It was recognised however that pernicious anaemia could be diagnosed in the absence of megaloblasts.

OLD TREATMENT.

Arsenic was the remedy par excellence for pernicious anaemia. We now know that arsenic acts by non-specific stimulation of the bone-marrow. Iron was mostly useless in pernicious anaemia. It seemed

however to enhance the action of arsenic. We now know that in the later stages of treatment of pernicious anaemia, when liver extract has increased the red cell count and produced a relative poverty of haemoglobin content, iron is necessary to raise the blood to the normal level. Next to arsenic, intestinal antiseptics were much in vogue in the treatment of pernicious anaemia. This was in consonance with Hunter's theory of its haemolytic origin. Splenectomy had its advocates, but was not popular. Blood transfusion was recognised as a life saving measure in emergencies.

Iron in some form or other was used in all "secondary" anaemias. Dosage was very insufficient, though in chlorosis blaud's pill was given in increasing dosage. Organic iron was still not out of favour. Even to-day enterprising manufacturing firms are finding a good market for preparations of haemoglobin put up as most readily assimilable! Parenteral route was considered more efficacious than oral. Injectio Ferri was in fact included for the first time in the 1932 British Pharmacopoeia, but in a couple of years Witts who was largely instrumental in its inclusion regretted it, for iron by injection is no more effective than iron by mouth and the margin between the toxic and therapeutic doses of parenteral iron is very narrow.

DIFFERENTIATION OF "PRIMARY" ANAEMIAS.

The next step in the evolution of anaemias was the differentiation of "primary" anaemias. Haematologists began to recognise that

morphology of the peripheral blood alone was hardly enough to diagnose pernicious anaemia. A number of conditions other than addisonian pernicious anaemia were found capable of causing a peripheral blood picture simulating that seen in pernicious anaemia. It has already been pointed out that infestation with the fish tapeworm always caused a picture of pernicious anaemia. Ankylostomiasis could give a similar blood picture, but rarely. Sprue was soon discovered as a more frequent cause of a "primary" than of a "secondary" anaemia. Other conditions which could also simulate in their blood picture pernicious anaemia were non-tropical sprue, pellagra, idiopathic steatorrhoea (whether identical with non-tropical sprue or not), chronic diarrhoea from any cause, intestinal tuberculosis, intestinal anastomosis and other short-circuiting operations, gastrectomies, and gastro-enterostomies, gastro-colic fistulae, cancer of the stomach, pernicious anaemia of pregnancy, in fact, any condition which interfered with the manufacture or absorption of the haemopoietic factor now known to be essential for the complete maturation of the red cell. Aplastic anaemias too could cause difficulty of diagnosis.

ACHLORHYDRIA IN ANAEMIA.

Many of the disease states enumerated above could with care be differentiated. The first non-haematological sign of pernicious anaemia to be recognised was achlorhydria. Absence of free hydrochloric acid in the gastric juice of patients with pernicious anaemia was noted in 1886, but the credit for the insis-

tence on its supreme diagnostic importance must go to Hurst. The achlorhydria must now be so absolute as to be histamine-refractory. The constancy of histamine-fast achlorhydria in relation to addisonian pernicious anaemia is such that, even after the dissociation demonstrated by Meulengracht¹ of acid from "haemopoietin" (Castle's intrinsic factor) production, no case will be accepted as true addisonian pernicious anaemia if free hydrochloric acid is present or could be produced in the gastric juice, unless other incontrovertible evidence is offered. Such evidence has been forthcoming just in a handful of cases. The underlying atrophy of the gastric mucosa, due either to congenital defect or to progressive damage by gastritis, was till very recently considered as irreversible. Jones, Benedict and Hampton² have recently shown by gastroscopic observations that the structural changes in the gastric mucosa in pernicious anaemia are reversible, as the lingual changes in it and sprue are. Achlorhydria is not so constant or so absolute in other "primary" anaemias as in pernicious anaemia. It plays a considerable role in "secondary" anaemias as well, for hydrochloric acid facilitates iron absorption.

BILIRUBIN CONTENT OF BLOOD.

There are a number of other laboratory data which are not of absolute value in the differential diagnosis of pernicious anaemia from other "primary" anaemias. A positive indirect van der Bergh reaction is present in all anaemias associated with increased haemolysis, whether the haemolysis is the

cause of the anaemia or the effect. Where however haemolysis is the cause, the bilirubin retention will be higher and associated with increased reticulocytosis. In pernicious anaemia as in other "primary" anaemias, not directly due to haemolysis, the reticulocytes in untreated cases will be normal or subnormal. In sprue and so-called tropical macrocytic anaemias the icterus index will rarely be so high as in untreated cases of pernicious anaemia.

MATURITY OF THE POLYMORPHONUCLEAR LEUCOCYTE.

Increased maturity of polymorphonuclear leukocytes is considered a very important confirmatory sign of pernicious anaemia. Cooke³ describes two kinds of hypermature polymorphs in pernicious anaemia, one in which the nuclear segmentation is increased, the other in which the size of the cell is increased, sometimes to gigantic dimensions. But if there is any point in the modern view of haemopoiesis, it is inconceivable that, in pernicious anaemia alone of all "primary" anaemias, there should be hypermaturity of the polymorphonuclear cells. Is there however a gastric leukopoietic factor which controls the growth of the white cells? If there is, it may be intimately associated or be identical with Castle's intrinsic factor which promotes growth of the red cell. In that case, hypermature polymorphs may go with that "primary" anaemia which is due to lack of intrinsic factor. So long ago as 1915 hypermaturity of the polymorphs was described in Madras⁴ in association with "primary" pernicious anaemia

of pregnancy. Whatever the significance of aged neutrophils, one thing seems to be clear. Actual leukocytosis or a relative neutrophilia or a shift to the left of the neutrophils puts pernicious anaemia out of account. It is difficult to find leukocytosis in pernicious anaemia, even in the presence of sepsis.⁵

POIKILOCYTOSIS.

A few minor morphological changes in the blood have been described as characteristic of addisonian pernicious anaemia, and as not present in the other "primary" anaemias. Davidson⁶ attached diagnostic significance to the oval shape of the bigger red cells in pernicious anaemia as opposed to their round shape in other "primary" anaemias, sprue anaemia for instance. The oval cells were called megalocytes, the round macrocytes. This distinction is not borne out in practice and should not be, in view of the present day conception of the factors controlling maturation of the red cell. Whether the arrest of maturation is due to lack of Castle's gastric or food factor or to malabsorption of the hæmopoietic factor which results from their interaction, the effect on the development of the red cell should be the same. The difference, if any, should be merely quantitative. The oval shape is merely an expression of poikilocytosis. Davidson²⁹ has recently presented a unified conception of all "megalocytic" anaemias, due to specific defect of anti-pernicious anemia principle of liver. He has differentiated them from "macrocytic" anaemias arising from prolonged stimulation of the bone marrow, as in chronic hæmolytic

anaemia, malignant malaria, lead poisoning, leukopenic and terminal leukopenia, Hodgkin's disease, malignant infiltration of the bone marrow.

MORPHOLOGY OF THE RED CELL.

Piney⁶ of all English hæmatologists made a special differentiation of the nucleated red cells in pernicious anaemia and other "primary" anaemias. He made out that the "megaloblasts" of pernicious anaemia were distinct from the "macronormoblasts" of other "primary" anaemias, and represented a reversion to the embryonic type of red cell formation. All causes which normally brought about a "secondary" anaemia could, in subjects with predisposition to embryonic reversion, produce a picture of "primary" anaemia. He there found a facile explanation for one's constitutional predisposition to pernicious anaemia. Piney's megaloblasts could only develop into megalocytes, while the post-natal normocytes were evolved from macronormoblasts.

Turnbull's⁷ view of the evolution of the red cell is more in consonance with observed facts. There are four signs of maturity of a red cell, the size, the shape, the cytoplasmic staining properties and the nuclear structure. Maturation of the red cell, while normally uniform in respect to all the four criteria, may in disease states be arrested at different stages of each and give rise to hybrid cells which cause confusion. Growth in size is from big to small, in shape from oval to round, in staining of cytoplasm from blue to gray to pink, and in nuclear structure from reticular, through

several gradations, to pyknotic and from pyknosis to complete extrusion or dissolution of nuclear material through the reticulocyte, the analogue on vital staining of the polychromatic cell. The degree of poikilocytosis, anisocytosis, polychromasia or basophilia, punctate as well as uniform, and the number and variety of nucleated red cells give a quantitative expression to the qualitative defect of factor or factors necessary for maturation of the red cell. The ultimate qualitative defect is the same in all "primary" anaemias.

CLINICAL FINDINGS IN PERNICIOUS ANAEMIA.

There have been described some clinical associations of addisonian pernicious anaemia which are said not to occur in other "primary" anaemias. It has long been known that in addisonian anaemia the patient is almost always well built. Absence of wasting would be reconcilable with severe anaemia, if the anaemia were solely due to lack of a specific factor, to wit, the intrinsic (gastric) factor and there were no other defect. It is such a lack or defect that is postulated in addisonian pernicious anaemia. In the other "primary" anaemias the defect is either nutritional, and therefore likely to be multiple, or due to interference with intestinal absorption, and therefore apt to be associated with impaired absorption of the body building materials.

Davidson⁵ lays stress on the extreme degree of anaemia in pernicious anaemia compatible with more or less normal activity. It is certainly surprising to see the number

of patients with pernicious or pernicious-like anaemia who do not take to bed. Whether this peculiarity is characteristic of addisonian pernicious anaemia to the exclusion of other "primary" anaemias is more than one can say.

Reference may incidentally be made to the disguises under which pernicious anaemia may masquerade. Davidson⁵ instances gastro-intestinal disorders and indefinite fatigue. I have come across the latter as the sole symptom of pernicious anaemia in an elderly gentleman who showed marked clinical improvement with a reputed stomach preparation. Two of his children, whom I have had a chance of examining, have a typical megalocytic picture and have frequent attacks of glossitis and occasional diarrhoea. One of them gave practically a flat base line curve for free HCl on fractional gastric analysis and is now having wide-spaced injection of liver extract to prevent a full blown anaemia. His lingual and gastro-intestinal symptoms are at any rate kept in abeyance. I have had a chance too of following the striking reticulocyte response to injection of a well known liver extract in an elderly woman with megaloblastic anaemia whose sole symptom was marked asthenia of six weeks' duration.

NERVE SYMPTOMS OF PERNICIOUS ANAEMIA—S. C. D.

The association of signs in varying degree of postero-lateral degeneration with addisonian pernicious anaemia has long been described. The neural symptoms may vary from peripheral paraesthesiae to

outspoken symptoms of subacute combined degeneration. The signs too may vary from a mere loss of vibration sense or a slight rhombegism or a change in a reflex to marked ataxia and paraplegia, and signs of cortical degeneration too. Such constancy of association of nervous involvement would seem to be rare in "primary" anaemias other than pernicious anaemia. It must be conceded that such close relationship between the haematological and neurological manifestations of pernicious anaemia and of both with histamine-refractory achlorhydria is very striking indeed. It is quite likely that lack of the gastric haemopoietic factor is so closely associated with defect of the neuropoietic factor, whether the two are the same or different, and want of both with absence of free HCl as to be of clinical diagnostic value. In the other "primary" anaemias the intrinsic gastric factor is not absent and presumably the neuropoietic factor is present too. The "primary" anaemia picture in them is due either to defective diet or absorption and is not accompanied by symptoms of nerve degeneration.

PRICE JONES'S CURVE.

A passing reference must be made to the diagnostic value of Price Jones's curve. It is however a laborious procedure.

VOLUME INDEX.

The Americans prefer the more rapid volume index calculated from the haematocrit value. They claim that volume and colour indices of over 1.25 occur in no other condition than in pernicious anaemia. It has already been pointed out that it

is futile to expect diagnostic aid in doubtful cases from changes in the red cells alone.

EVE'S HALOMETER.

Eve's halometric reading is not dependable, but is a rough and ready reckoner. Pijper's bloodcelltester⁸ is a new diffraction apparatus for measuring the mean diameter of the red cells and the extent of anisocytosis and poikilocytosis. If its value is confirmed, it will give at a glance a fund of information.

HCl TREATMENT OF PERNICIOUS ANAEMIA.

In regard to treatment of pernicious anaemia Hurst's emphasis on the etiological significance of achlorhydria led to the routine administration as substitution therapy of one to two drachms of dilute hydrochloric acid, B.P., twice or thrice daily. Since the introduction of specific liver treatment Hurst was among the first to recognise that want of hydrochloric acid need not be made up in the absence of gastro-intestinal symptoms, chiefly diarrhoea and flatulence. When the acid is given it must be given in effective dosage. It is more constantly indicated now in sprue and other diarrhoeic states associated with anaemia.

EVOLUTION OF LIVER TREATMENT OF PERNICIOUS ANAEMIA.

It was for a long time recognised that a rich protein food hastened remission in pernicious anaemia. The Chinese seem to have known in the twentieth century B.C. the value of liver in anaemia. They used crow's liver. Liver soup was

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empirically used in the treatment of sprue.

But it was not till Minot, Murphy and their co-workers demonstrated in 1926 that liver was effective in pernicious anaemia that the foundation was laid for the present day specific treatment with liver or liver extract of pernicious and other "primary" anaemias. The epoch making experiments of Castle and his co-workers from 1928 onwards have completely revolutionized our conception of pernicious anaemia. They laid low the haemolytic toxic theory of the origin of pernicious anaemia, presented the modern conception of the disease as a conditioned nutritional deficiency, based on an intrinsic gastric defect. They brought together the rival schools of primary haemolysis arising from gastro-intestinal toxins led by Hunter and primary bone marrow defect sponsored by Ehrlich. Neither was wholly right. The defect was gastric in origin, but not toxic. The fundamental derangement was in the bone marrow, but the marrow dyscrasia was not primary; it was not secondary however to haemolysis.

Though it is fairly clear that pernicious anaemia is a nutritional disorder, the toxic theory of its origin is now and again raising its head. Mermod and Dock⁹ confirmed that colloidal dye was effective in treating pernicious anaemia and evoking reticulocyte response in guinea-pigs. Congo red is notably anti-toxic and its reported effect makes imperative a re-exploration of the old theory that pernicious anaemia is due to excessive absorption or deficient detoxication of noxious substances derived from the gastro-

intestinal tract. Wakerlin and Bruner¹⁰ have since found in urine of untreated pernicious anaemia patients a thermolabile, toxic, reticulocyte decreasing factor, not present in normal urine or in urine of treated patients.

If bone marrow could thus be depressed, experimental production of pernicious anaemia should become possible. Miller and Rhoads¹¹ by feeding swine with a modified form of the diet which produces black tongue in dogs have produced a symptom-complex, not unlike that of pernicious anaemia; it is relieved by liver extracts.

ANTI-PERNICIOUS ANAEMIA LIVER FACTOR.

The liver principle effective in pernicious anaemia is a relatively small, predominantly basic, nitrogenous compound, thermostable and readily extracted by alcohol. Subba Rao, Jacobsen and Fiske¹² separated from potent liver extracts three substances, two of which were obtained in crystalline form; one was identified as l-tyrosine and the other was believed to be a complex purine. The identity of the third fraction was not ascertained. The three together and separately produced a marked reticulocytosis in guinea pigs and the mixture was clinically effective in pernicious anaemia. Dakin and West¹³ have in the meantime isolated an active material, which yielded on hydrolysis an aminohexose and a number of amino acids, viz, lysine, arginine, glycine, leucine, hydroxyproline and aspartic acid. Pyrimidine or purine bases were absent. The substance was slowly decomposed by pepsin and more rapidly by erepsin. Pancreatic juice had no effect.

CASTLE'S (GASTRIC) INTRINSIC FACTOR.

The liver principle is elaborated in the body by the interaction of two factors, an intrinsic gastric factor and an extrinsic food factor. It has not yet been synthesized outside the body. The intrinsic factor is a thermolabile, non-alcohol-soluble enzyme, not identifiable so far with any of the known peptic secretions. There is no chemical or easy biological test to detect its presence. Its presence in gastric juice can only be proved by a clinical experiment, by administering it in conjunction with a source of extrinsic factor to a patient with undoubted pernicious anaemia and noting the response of the patient's bone marrow. Recently the intrinsic factor has been said to produce a reticulocyte response in guinea pigs¹⁴ and rats¹⁵. This has to be confirmed and it has to be proved too that the intrinsic factor in its preparation is not contaminated with the extrinsic factor. Till the intrinsic factor is chemically identified and an undoubted test for its presence is found, it is difficult to maintain that pernicious anaemia is a distinct disease entity, separate from the other liver principle deficiency anaemias.

Recent work would in fact seem to bring all the liver principle deficiency anaemias closer together than before. There is evidence to show that intrinsic factor is hardly completely absent in any case of pernicious anaemia. If it were, it should be impossible to account for the spontaneous remissions of pernicious anaemia which were characteristic of the disease even before the

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advent of liver therapy. It is indeed one of the defects of Castle's intrinsic factor theory that it does not adequately explain the spontaneous remissions of pernicious anaemia. Morrison's¹⁶ concept of the presence of heteropic gastric tissue, demonstrated in Meckel's diverticulum for instance, and of exhaustion and, with rest, of recovery of the intrinsic factor cells in the stomach does not solve the difficulty. Meckel's diverticulum is a rare congenital anomaly. It has yet to be demonstrated that intrinsic factor is secreted elsewhere than in those parts of the stomach and the short length of the duodenum which contain Brunner's glands and to which Muelengracht¹ has localised haemopoietic secretion. Isaacs and Goldhamer¹⁷ have shown a quantitative reduction of gastric juice in pernicious anaemia and re-increase on effective treatment of the anaemia. Goldhamer¹⁸ has found the intrinsic factor in the gastric juice of patients with pernicious anaemia in relapse, and he instances the production in patients with pernicious anaemia, who apparently have no intrinsic factor in their gastric juice, of some mature red blood cells despite the specific conclusion that the intrinsic factor must be present in order to accomplish this. He suggests that the defect in gastric secretion in pernicious anaemia is quantitative rather than qualitative. This robs pernicious anaemia of its position as a definite disease entity. Pernicious anaemia then becomes merely the manifestation of the severest degree of liver principle deficiency. Castle and his co-workers¹⁹ have themselves recently offered evidence in that direction in their observations

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in Puerto Rico on a hundred severe sprue cases and subsequent experiments on animals.

Morris and his co-workers²⁰ claim that concentrated gastric juice contains a haemopoietic factor effective in pernicious anaemia seemed at first to disprove the need for interaction of the intrinsic factor with an extrinsic factor before it could become haemopoietically effective. The difficulty was got over by the suggestion that the haemopoietic activity of *addisin*, the haemopoietic factor obtained by Morris and others in concentrated gastric juice, was due to the provision of extrinsic factor by desquamated gastric cells and partially digested food or from protein substances known to be present in the gastric juice. A similar explanation was offered for the effectiveness of stomach preparations in pernicious anaemia; the extrinsic factor was obtained from the ground gastric muscle and desquamated cells. The clinical effectiveness of autolyzed yeast in undoubted cases of pernicious anaemia, either at the beginning of treatment or later on, was in the first instance hard to explain on Castle's theory. It was thereupon suggested that the intrinsic factor was not completely absent in all cases of pernicious anaemia and that the interaction between the intrinsic and extrinsic factors proceeded on the basis of the law of mass action. If there were a relative poverty of intrinsic factor, it could be made up for by excess of extrinsic factor, and *vice versa*.

GREENSPON'S THEORY.

In order to obviate these strains on Castle's theory and on the basis

of a well planned series of experiments Greenspon^{21 and 22} suggested that there was only one haemopoietic factor, the gastric factor. Its effectiveness only on incubation with beef muscle or autolyzed yeast, Greenspon explained as due to the inactivating effect of gastric pepsin; this was removed by absorption by protein food material. The "extrinsic" factor was thus done away with. The gastric anti-pernicious anaemia factor, *Wilkinson and Klein's haemopoietin*, and the liver anti-pernicious anaemia factor were identical. Greenspon explained the action of the source of the extrinsic factor as one of binding the pepsin in the gastric juice or mucosa and releasing the anti-pernicious anaemia factor from the inhibiting action of pepsin. The effect of autolyzed yeast, instead of serving as a plentiful source of extrinsic factor, was stimulation of cells that elaborated the gastric hormone or supply of material for the synthesis of the latter. Pernicious anaemia of the tropics was defined as a less severe condition than true Addisonian pernicious anaemia and showed less damage of the gastric mucosa and was more responsive to autolyzed yeast. Davidson had earlier shown that some genuine cases of Addisonian pernicious anaemia could be effectively treated with marmite alone. Greenspon compared the anti-anaemic agent of the stomach to insulin. Each was elaborated by a glandular structure, which also produced a digestive enzyme, pepsin and trypsin respectively, capable of exerting an antagonistic action. The liver stored the stomach principle, which was possibly a precursor of the former, or a kinase which promoted formation of active liver hor-

none. Using the knowledge that the anti-anaemic agent of the stomach was inactivated by pepsin, Greenspon greatly improved the potency of preparations of stomach tissue developed by Sharp and by Sturgis and Isaacs and of concentration of gastric juice with inconsistent results by Morris.

Klein and Wilkinson had shown that the anti-anaemic principles of liver and stomach were different, because of their different heat stabilities and different solubilities in 70 per cent alcohol. Greenspon quietly brushed aside this objection on the ground that an active agent in an impure mixture frequently showed a different vulnerability to heat. Ungley and Moffett²⁸ have recently tested Greenspon's theories. They found that depepsinized gastric juice and pepsin-free extracts of pyloric mucosa had little or no haemopoietic effect when given by mouth unless interaction with a source of extrinsic factor (e.g., autolyzed yeast) was allowed. In these circumstances the role of the extrinsic factor could not be attributed to absorption of pepsin, since none was present. The effect of intrinsic and extrinsic factors given simultaneously was considerably greater than the sum of effects, if any, produced by the two factors given under conditions designed to prevent their interaction. This interaction of the intrinsic and extrinsic factors does not require incubation outside the body. Since autolyzed yeast in the dose employed (12 g. daily) required interaction with normal gastric juice or pyloric extract to render it effective for blood regeneration, it probably acted by virtue of its content of

extrinsic factor, and not because it stimulated the elaboration of the gastric hormone or furnished material for its synthesis.

Hanes, Hansen-Prüss and Edwards²⁴ have also fed five cases of untreated pernicious anaemia with normal gastric juice treated with strict adherence to Greenspon's technique and have failed to get subjective or objective improvement. They wonder if the extrinsic factor was present in Greenspon's experiments in the patients' stomach or in the donors' gastric juice.

Ungley and Moffett's experiments were primarily undertaken to test Dakin's suggestion in a personal communication about the possible identity of the intrinsic factor with pepsinogen. Records of 14 cases showed that pepsinogen and the anti-anaemic factor were dissociated physiologically and anatomically.

Other attempts to identify the intrinsic factor were by spectroscopic observations²⁵ of gastric juice. It is suggested on their basis that the selective secretions of the stomach are due to a vitamin B complex substance. Argentaffin cell rich tissue, present in stomach, intestines and other incretory organs, produce haemopoietic substance. They are said to be diminished in pernicious anaemia.²⁶ Enös and Kunos found however that intestine of starved hens, which was very rich in argentaffin tissue, while it effected improvement in Bartonella anaemia of rats, gave very inadequate results in pernicious anaemia in man, but favourable results in "secondary" anaemia.

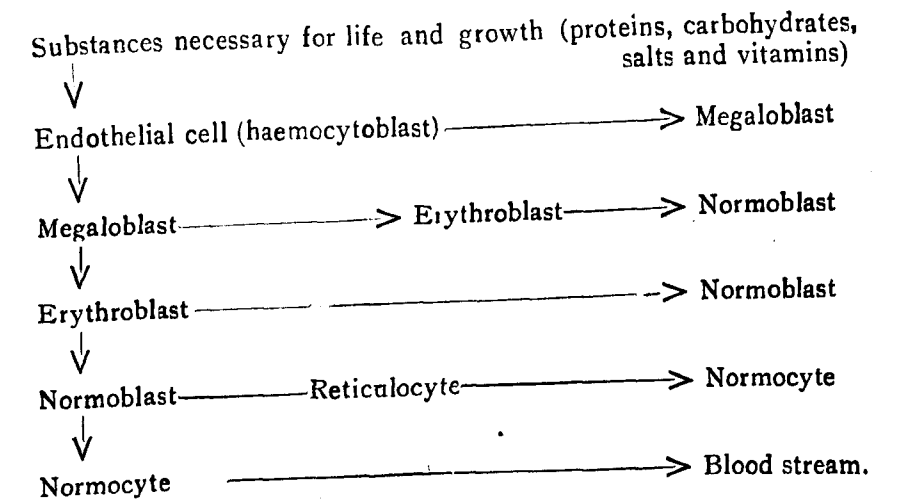
CASTLE'S (FOOD) EXTRINSIC FACTOR.

Castle's extrinsic factor is soluble in water and in 80 per cent alcohol, and is thermostable at 120° C for 5 hours. It is present in muscle meat, wheat germ, rice polishings, eggs and possibly tomatoes. Liver and liver extract contain, in addition to fully formed active principle, a considerable amount of the extrinsic factor. Marmite, an extract derived from autolyzed yeast, is a rich source of extrinsic factor, but dried

yeast is apparently inactive in this respect. . . . Strauss and Castle originally suggested that the extrinsic factor might be vitamin B₂, but other workers have been unable to identify it with any known portion of vitamin B complex (Ungley).²⁷

The exact mode of action of the anti-pernicious anaemia principle of liver is not unknown. A deficiency of it arrests red cell development at or near the level of the haemohistioblast. Haden²⁸ presents the life history of the erythrocyte in a succinct tabular form thus :

LIFE HISTORY OF THE ERYTHROCYTE.



Active life of from two to six weeks.

Death by fragmentation and engulfment by reticulo-endothelial cells.

End products : iron and bile pigments.

Arrest of development at each of the stages indicated will result in the appearance in the peripheral blood of the premature red cells shown in the same horizontal line. The arrest of development may be due to specific or non-specific deficiencies. It is interesting to note that Davidson²⁹ talks of prolonged severe deficiencies, other than specific liver principle deficiency, as likely to cause by excessive normoblastic reaction a peripheral macrocytic blood picture. Similarly Prof.

Bence³⁰ of Budapest, basing his observations on gastrectomized dogs, believes, that in man as well, pernicious anaemia presents in the beginning stages a microcytic, hypochromic alteration of the blood picture, but it is not open to medical observation.

Future alone will show whether these observations will strike at the very root of the specificity of some of the known factors for complete maturation of the red cell. Be that as it may, there are to-day four recognised specific deficiencies which arrest development of the erythrocyte at definite stages.

PRESENT DAY CLASSIFICATION OF ANAEMIAS.

Before enumerating manifestations of the known specific deficiencies, a few remarks will not be out of place on the present day classification^{28, 7, 31} of anaemias on a morphological basis. There is no doubt that classification of anaemias, as of any disease, is best etiological. Because of the imperfection of our knowledge of etiology, we have to be content sometimes with a classification based on a study of the changes in the blood in regard to size and haemoglobin content. It is time that description of an anaemia as primary and secondary goes altogether.

DIAGNOSTIC CRITERIA.

On such a basis with laboratory data comprising

1. The red cell count,
2. Haematocrit reading,
3. Haemoglobin content, as estimated by a standard haemoglobinometer and not by the Tallqvist's scale,

4. The volume index, V.I. (relative mean volume of the red cell),

5. The colour index, C.I. (relative mean haemoglobin content of the red cell),

6. The bile pigment content of the plasma (icterus index, I. I.),

7. The reticulocyte count, R. C.,

8. The diameter of the red cell, qualitative changes in the stained cells, the number and types of white cells, the platelet count, and the coagulation and bleeding times, which may be of help in some cases,

Haden²⁵ classifies anaemias as follows:

1. *Normocytic and Normochromic*.—V. I. and C. I. normal; found in acute haemorrhage, aplastic anaemia and simple depression of bone marrow.

2. *Normocytic and Hypochromic*.—V. I. normal, C. I. low; found in early iron deficiency, chronic haemorrhage (I. I. low or normal).

3. *Macrocytic and hyperchromic*.—V. I. and C. I. increased; found in liver factor deficiency anaemia (I. I. ++, R. C. low), and accelerated destruction of rbc sometimes (I. I. ++, R. C. ++).

4. *Macrocytic and normochromic*.—V. I. increased, C. I. normal.

5. *Macrocytic and hypochromic*.—V. I. increased, C. I. low.

6. *Macrocytic and hypochromic*.—V. I. and C. I. low; found in

prolonged iron deficiency and chronic haemorrhage.

LIVER PRINCIPLE DEFICIENCY ANAEMIA.

Liver principle deficiency will cause arrest of development of the red cell at the haemocytoblastic stage or below it and cause a reversion of haemopoiesis to the megaloblastic type. The peripheral blood picture will be of the macrocytic and hyperchromic type in pure deficiencies of the liver principle. In dual deficiencies of iron as well as of liver principle, one may get the macrocytic and normochromic or even macrocytic and hypochromic picture.

IRON DEFICIENCY ANAEMIA.

Iron is necessary for the normal division and growth of normoblasts and formation of haemoglobin. Iron deficiency will therefore cause a reversion to the normoblastic type of erythrogenesis, with a corresponding peripheral blood picture of simple hypochromia or hypochromia with microcytosis. In mixed deficiencies one is likely to get all the possible permutations and combinations of changes in size and in pigment content.

THYROXINE AND VITAMIN C. DEFICIENCY ANAEMIAS.

Two other specific deficiencies are recognised to-day. One is thyroxine deficiency, generally giving rise to a simple hypochromic anaemia. No amount of iron in such an anaemia will restore the blood condition to normal unless one recognises the thyroid factor and rectifies its defect. Vaughan mentions a magalocytic hyperchromic anaemia associated with myxoedema! The other specific deficiency known is that of vitamin C. Anaemia in scurvy may be due not merely to the mechanical blood loss, but also to the lack of the specific factor. Sub-clinical scurvy will cause anaemia that will respond to vitamin C alone. Such an anaemia is generally normocytic, occasionally macrocytic³².

MECHANISM AND MANIFESTATIONS OF LIVER PRINCIPLE DEFICIENCY.

Liver principle deficiency or macrocytic anaemia may be due to one of five factors, mentioned below with the corresponding clinical conditions noted against them:

Deficiency	Resulting or associated clinical condition.
(i) food	Tropical macrocytic anaemia, Sprue (Castle, Minot), Pernicious anaemia of pregnancy (relative).
(ii) gastric	Addisonian pernicious anaemia, Gastric carcinoma, Gastro-intestinal operations, Gastro-jejunal-colic fistula.
(iii) absorption	Tropical sprue (Fairley), Non-tropical sprue, Idiopathic steatorrhoea (Coeliac disease),

Dibothriocephalus latus infestation,
Chronic diarrhoeas.

(iv) storage Cirrhosis of the liver.

(v) utilization Wilkinson's achrestic anaemia.

Many leading haematologists are very lukewarm about Wilkinson's achrestic anaemia. Minot³² objects that because an anaemia does not respond to liver, it does not imply that there is inability to utilize or mobilize the material needed by the pernicious anaemia patient. Because purpura cases do not respond to orange juice they cannot be deduced as cases of scurvy failing to utilize vitamin C. Davidson³³ is very cautious in accepting achrestic anaemia as a disease entity. He wants further information and thinks it possible that some of the seven cases then described by Wilkinson and Israel³⁴ might be chronic aplastic anaemia. Further informations has since been forthcoming. At the time of Davidson's and Minot's criticism only one case of achrestic anaemia had come to post mortem. Post-mortem liver extract from this case was found to be active when injected into another patient with pernicious anaemia. Wilkinson and Israel³⁵ have since reported on four more cases, three of which died in spite of massive liver therapy and repeated blood transfusions; the livers of these patients who died were rich in

active material. There seems little doubt left about the existence of achrestic anaemia as a disease entity.

MECHANISM AND MANIFESTATIONS OF IRON DEFICIENCY.

Haemoglobin deficiency is the feature of "iron deficiency anaemias," and this may arise from lack of material other than iron needed to build up the haemoglobin molecule, so that all or some of the conditions referred to for clarity as "iron deficiency anaemias" may be primarily dependent on some more subtle or extensive defect. They can however be cured or permanently arrested by iron therapy. Chlorophyll apparently enhances utilization of iron, Whipple's liver fraction, effective in post-haemorrhagic anaemia, is distinct from pernicious anaemia factor of liver and may be one of the factors other than iron. Role of copper is not finally settled yet (Minot)³². Pyrrole derivatives like bile pigments and cytochromes of yeast are other potentiating factors (Witts)³⁶.

Iron deficiency or hypochromic anaemia may be due to

deficient intake resulting in nutritional or milk anaemia of infants and microcytic hypochromic anaemia of older children and adults, possibly chlorosis, and, relatively, hypochromic anaemia of pregnancy;

deficient utilization resulting in idiopathic hypochromic anaemia of (anacidity) Witts, hypochromic anaemia of preg-

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nancy, hookworm anaemia, hypochromic anaemia associated with idiopathic steatorrhoea and other chronic diarrhoeas including early cases of sprue, hypochromic anaemia associated with organic lesions of the gastro-intestinal tract, like gastric carcinoma, gastro-intestinal operations, intestinal obstruction;

deficient utilization,
blood loss from

mechanical causes: trauma, peptic ulcer or cancer, uterine bleeding, hookworm anaemia and abnormalities of blood or blood vessels like purpura, haemophilia, hereditary haemorrhagic telangiectasis;

accelerated destruction as in haemolytic anaemias due to infections and poisons (malaria of the greatest importance to us);

chronic haemolytic icterus (acholuric jaundice),

sickle cell anaemia, paroxysmal haemoglobinuria, acute haemolytic anaemia of Lederer, erythronoclastic anaemias of infancy: icterus gravis neonatorum, icterus non-gravis neonatorum, congenital hydrops foetalis,

It will be noticed that some of the anaemias are put down to iron deficiency arising from deficient intake as well as from defective absorption. Anaemia of pregnancy for instance may be due to actual deficiency of diet or due to relative deficiency caused by hypochlorhydria. Presence of hydrochloric acid in the stomach is essential to effect the maximum absorption of the iron intake, probably because iron in whatever form it is taken is converted to ferrous chloride in the stomach before absorption. Iron is absorbed chiefly in the duodenum.

Average daily requirement of iron is 6 to 11 mg. per male adult. The female adult requirement should be a little larger to allow for monthly losses, amounting on the average to 12 mg. per month. The pregnant and lactating woman should increase her iron intake to 15 to 20 mg. daily. Growing children require 0.6 mg. of iron per kg. of body weight. In calculating the iron content of foodstuffs allowance must be made for availability of this iron. This varies in different foods. Iron content of milk falls during lactation. Cow's

milk contains less of iron than human milk. Infants fed purely on milk are likely to develop nutritional milk anaemia unless extra iron is supplied.

Hookworm anaemia was for long considered due to a toxin secreted by the hookworm. But the anaemia resulting from ankylostomiasis is never associated with evidence of haemolysis, such as increased icterus index and reticulocytosis in an untreated case. It responds very rapidly to massive doses of iron even before the worms are removed by anthelmintic treatment. These two observations have promoted the belief that hookworm anaemia is due to mechanical bloodloss and/or to interference with absorption of iron. It has long been known that the hookworms never stick to one site. They are constantly on the move in search of fresh pasture. All the rejected sites continue to ooze blood. It is also believed that the worm infestation may reduce gastric acidity. A conditioned deficiency of iron is thereby produced. The worms may also produce intestinal catarrh and impair absorption of iron.

Dual deficiency is fairly common in intestinal disorders, and will be manifested by a combination of signs of iron and pernicious anaemia factor deficiency.

OTHER DYSHAEMOPOIETIC ANAEMIAS.

Red cell development may be interfered with by depression of bone marrow function in idiopathic aplastic anaemia, in cachexia, chronic intoxication (tuberculosis, nephritis, chronic sepsis, etc.) metabolic

disturbances, chemical poisons (lead, NAB, benzene and gold), radioactive substances (internal as well as external), malignancy or infiltration of marrow by tumour or leukaemia or lymphadenoma, leucoerythroblastosis associated with carcinomatosis, myelomatosis or osteosclerosis (marble bone disease of Albers-Schonberg and myelosclerosis), and with Cooley's anaemia.

APLASTIC ANAEMIA.

Aplastic anaemia is a diagnosis that is apt to be made when there is no response to treatment particularly of a macrocytic anaemia. This should be avoided. Till recently pathologists were content to examine the long bones in autopsy or biopsy for evidence of haemopoietic activity. In severe untreated anaemias it used often to be found that there was no sign of activity of the marrow in the long bones. It has now been shown that the vertebrae, ribs and sternum are a better guide to the state of the marrow under stress. Peabody¹⁹ has emphasized this. Castle and his co-workers¹⁹ have verified Peabody's conclusions in their examination of the sternal marrow in sprue anaemia in Puerto Rico.

If a patient with pernicious or pernicious-like anaemia does not respond to treatment it is easy to fall back on aplasia as the cause of failure of response to treatment. It is essential to remember that infections, severe damage to vital organs, arteriosclerosis, increased or altered metabolism will inhibit response to treatment. In regard to the inhibiting effect of infection, comparable to its effect on insulin, it has been

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noted that even an ordinary cold is enough to interfere with the curative effect of liver. Pyelitis is another very common cause, especially in women.

UNCLASSIFIED ANAEMIAS.

Splenic anaemia and von Jaksch's anaemia form a group by themselves of unclassified anaemias.

LIVER EXTRACTS.

From the introduction in 1926 of feeding of liver amounting to not less than half a pound daily to the reported isolation by Strandell¹⁸ in 1935 of a liver fraction 2 mg. of which in water given intramuscularly is markedly haemopoietic, it is a very far cry. Strandell's method has not been published. Dakin and West have however obtained by "Reinecke precipitation" a 1 per cent. yield of the dry liver extract. Intravenously, 75 mg. doses have produced maximal reticulocyte responses. Wilkinson²⁸ has carried Dakin and West's purification further and produced maximal reticulocyte response with 18.36 mg. representing 665-1332 g. of liver. He reports that further fractionation is in progress.

Cohn, Minot and their co-workers had in 1930¹⁸ obtained liver extracts active intravenously in doses as small as 25 mg. daily. But their methods were very costly and involved considerable loss in fractionation. Parenteral liver extracts introduced by Gänsslen¹⁸ and Castle¹⁸ were derived from 5-20 g. of liver and were 30 to 100 times more effective than by the oral route.

Now that potent liver extracts are available feeding of liver and

peroral administration of liver extracts have gone out of date. They are slow in action and are more expensive in the long run. Stomach preparations are not available for parenteral use.

RETICULOCYTE RESPONSE TO TREATMENT.

The effect of liver extract is specific in all macrocytic anaemias. The reticulocyte response is a measure of the potency of the extract as much as it is a criterion of correct diagnosis. It is a quicker measure of therapeutic response than rise in red cell count and of haemoglobin. The total reticulocyte response is the same, independent of the route of administration and is always obtained on full quantitative supply of the defective factor. It is inversely proportional²⁹ to the initial red cell level and can be mathematically calculated⁴⁰ in advance of treatment. The rate of reticulocyte increase is however entirely dependent on the dose of the extract and its rapidity of absorption. It is here that parenteral liver extracts score over oral therapy.

The specificity of reticulocyte response can be used to fix the exact defect in a given case of macrocytic anaemia. Provided the patient's condition is not bad one may try, after a suitable control period without treatment and before each course, marmite, liver or its preparations or stomach extract, parenteral liver extract in succession. If marmite gives a reticulocyte response the anaemia is due to food defect, if marmite does not and peroral liver or stomach tissue does, the anaemia is due to intrinsic defect and therefore true Addisonian pernicious

anaemia; if both marmite and liver or stomach extract by mouth prove ineffective and injection of liver extract proves efficacious, the anaemia is due to defective intestinal absorption. This check on the differential diagnosis is hardly practicable.

There is one fallacy to be guarded against in the interpretation of the reticulocytosis test. The one stimulus to bone marrow activity is anoxaemia. Oxygen deficiency from any cause will stimulate erythropoiesis and will be accompanied by the tell tale evidence of increasing reticulocytosis. If however any of the inhibiting factors, infection arteriosclerosis, etc., are present, the bone marrow will not respond to supply of the specific element till the inhibiting factor is removed. Malarial anaemia, for instance, will, within limits, be cured by destruction of the parasites with quinine alone, without any haematinic treatment. Anaemias due to infection or intoxication will not respond to drugs so long as the infection or intoxication is left uncontrolled.

The reticulocytosis test is so specific that it is used to test the clinical efficacy of any new remedy for anaemia. A remedy for a specific defect should produce a sufficient reticulocyte response in a patient with the defect which it is said to make good. This test is equally efficacious for liver extracts and for iron containing preparations. The so-called double reticulocyte test⁴¹ is more sensitive than the single reticulocyte test. The double test compares the new remedy against a standard of known efficacy. After an initial control period without treatment, a course of the new

remedy is given in the first instance and its reticulocyte response charted out. After a control period long enough to let the reticulocyte response become minimal and remain as such, a course of the standard remedy in equivalent dosage is administered and its reticulocyte response measured too. If the second course produce a reticulocyte increase over the basal level, it follows that the new remedy does not come up to the level of the standard; if it does not, it does not follow that the preparation under trial is better than the standard. The test must be repeated in the reverse order. The new drug must produce a reticulocyte increase after the response to the standard has died out, before it can be accepted as better than the standard. This double reticulocyte test is a dependable check on the efficacy of new advertised drugs; to rely on the amount of original liver extracted from is fallacious, for there is bound to be varying loss of active material in the process of preparation.

MODERN IRON TREATMENT OF ANAEMIA.

The chief advance in iron treatment of anaemias is in the large dosage given, far above the pharmacopoeial dose, in the established superiority of inorganic preparations, and among them of the ferrous salts, and in the preference by choice of peroral therapy. On theoretical grounds ferrous chloride is the best, but it is a severe gastric irritant. The following table taken from Witts³⁶ gives the average effective daily dose of the common preparations of iron, the average effective dose being defined as the

dose which produces an average increase of over 1 per cent of haemoglobin a day in a sufficiently large sample of patients with achlorhydria and anaemia, when the initial haemoglobin level does not exceed 50 per cent and when the period of

observation is not less than 25 and not more than 40 days. The rate of haemoglobin regeneration in man rarely exceeds 2 per cent a day, and is inversely proportional to the initial haemoglobin level.

Preparation.	Daily dose in g. or cc.	Iron content in mg.	Utilization.
Metallic.—			
Fer. redact.	... 1.5 to 6.0	1,200 to 1,500	0.5 to 2.0
Ferrous.—			
Ferrous chlor.	... 0.25-0.5	100-200	12.5-25
Ferrous sulph. exsic.	... 0.6	180	14
Ferrous lact.	... 1.5	300	8
Pil. Ferri. carb. (Blaud's pill).	3.0-4.0	300-400	6-8
Ferric.—			
Liq. Ferri. perchlor.	... 8.0	400	6
Ferric cit.	... 2.0	400	6
Idozan (ferric hydrox.)	... 30-45	1,500-2,250	1.1-1.7
Soluble ferric oxide	... 35	1,000	2.5
Complex ferric.—			
Fer et am cit.	... 4.0-8.0	800-1,600	1.5-3.0
Injection.—			
Inj. Fe B. P.	... 5.0-10.0	16-32	100

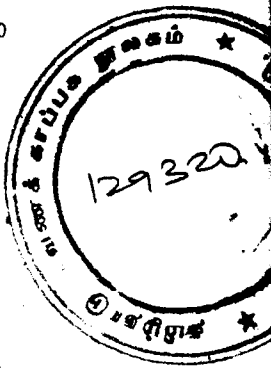
The percentage utilization is calculated as blood iron corresponding to 100% Hb=50 mg. per 100 cc.; blood volume=5 to 1. Thus 1% rise of Hb=gain of 50/100 multiplied by 50=25 mg. of iron as Hb.

The most active preparation of iron is not necessarily the most suitable. Medical choice is governed by a number of additional factors such as price, palatability, tolerability, durability and ease of prescription. All things considered, the scale preparations are favoured in doses of 90-120 grains a day. Ferrous sulphate is equally efficacious in doses of 9-12 grains a day. The ferrous salts tend to oxidise in solution. This may be inhibited by avoiding overdilution and making

up the mixture with glucose and/or acid. In solid form they are apt to cause vomiting. Tablets may become hard and insoluble unless freshly and carefully made. Reduced iron, (30 grs. a day), colloidal iron and Blaud's pill (45-60 grs. a day) are also used.

The triumph of modern iron therapy is in its prophylactic use in pregnant and lactating mothers⁴² and in nursings⁴³. It is a good practice to make it a routine to give every normal pregnant woman 9 grs. daily of ferrous sulphate and to every bottle-fed infant 3 grains of the salt or equivalent doses of other preparations. Where there is actual deficiency of haemoglobin large doses will be required.

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Just as liver extract given parenterally in pernicious and pernicious-like anaemias relieves the lingual and gastro-intestinal symptoms and signs in addition to restoring the blood condition to normal, iron relieves the soreness of the tongue, the fissuring at the corners of the mouth, the dystrophy of the nails, the atrophy of the skin and the bruising and the menorrhagia that accompany severe iron deficiency anaemia.

TREATMENT OF NERVOUS SYMPTOMS, OF S.C.D.

There was some doubt during the first few years of oral liver therapy whether the nervous symptoms were controllable. With the isolation of active parenteral extracts it has become increasingly clear that, given in sufficient dosage, liver extract does cause remission of much of the nervous disability. It definitely arrests further deterioration. It is essential that the dosage must be adequate to produce the maximal restoration to normal and maintain the blood at supra-normal level. It has already been mentioned that with partial rise in red cell count iron administration becomes necessary for sufficient pigment formation to occupy the increasing stroma. On the ground that the lesions in the nervous system are due to deficiency or poor utilization of vitamin A (Mellanby),⁴⁴ vitamin B₁ (Gildea, Kattwinkel and Castle⁴⁵) or iron (Sargent⁴⁶), massive replacement therapy has been recommended. The results are not consistent and are on the whole disappointing. There is no conclusive evidence that any material lacking the characteristic effect of liver upon hæmopoiesis in pernicious anaemia can arrest the

progress or influence course of sub-acute combined degeneration.⁴⁷

MAINTENANCE THERAPY OF ANAEMIAS.

Maintenance therapy is very important, both in liver principle and iron deficiency anaemias. In true addisonian anaemia the missing factor has to be supplied for the rest of the patient's life. In the other anaemias if sufficiency of the necessary principles can be secured in food or if absorption can be ensured, no further drug treatment is necessary. Relapse then becomes an economic question.

Nothing is more striking in the progress of the treatment of anaemias than the complete disappearance of arsenic as a hæmatinic remedy of value. Arsenic is now known to produce a non-specific irritation of the bone marrow and consequent reticulocytosis.

SPECIFICITY OF LIVER EXTRACT FOR CASTRO INTESTINAL SYMPTOMS.

In 1933 I felt that the lingual and gastro-intestinal symptoms of sprue were relieved with parenteral liver extract. On enquiry I found that the senior physicians of the hospital felt so too. Support was found for this belief in Minot's⁴⁷ Nobel prize lecture. He says that the gastro-intestinal and nervous symptoms of pernicious anaemia, sprue and pellagra were equally controlled by injection of liver extract. Castle⁴⁹ has now in Puerto-Rico gone a step further and produced complete cure of all symptoms with parenteral liver extracts, irrespective of diet. Miller and Rhoads⁴⁸ offer "unequivocal

evidence" of specificity of liver extract therapy of the intestinal manifestations of sprue, independent of anaemia.

APOLOGIA.

This review was planned long ago, but unfortunately it was so long deferred that when it was actually undertaken it was done under the stress of having to fulfil a promise in time. The effect of the stress has been painfully borne in on me as I have finished the survey. I therefore crave the reader's indulgence for all errors of omission and commission.

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Interpretation Of Serological Tests 'For Syphilis

BY

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Since the introduction of the original Bordet-Wasserman test for the diagnosis of syphilis, repeated attempts have been made to improve the same and to find newer and simpler tests with increased sensitivity without impairing specificity. In spite of the numerous precipitation tests available now, the complement fixation test continues to be popular. The perfect serological test for the diagnosis of syphilis, however, remains in the distant horizon.

The Kahn precipitation test has been more widely adopted than any other precipitation tests. But it has not replaced the complement fixation procedure. The League of Nations Health Committee in their special conferences held at Copenhagen and at Monte Vides have emphasized the importance of doing both tests on every sample of blood. In the examination of the relative merits of the tests demonstrated at the conference it was found that a large margin had to be allowed for the personal factor of those who performed the tests. Dr. Khan was very fortunate in having been able to personally demonstrate his test at the two conferences. His test has not, however, given the same agreement with clinical findings at the

hand of other people. It is because, the precipitation test though simple in technique is difficult to read and requires great care in its performance. The reading of the results very much depends on the visual acuity and experience of the person doing the tests. An inexperienced serologist may omit many a doubtful reaction and some positive results may be missed. Kahn's "presumptive test" may serve to bring out the positive reactions better; but it is likely that specificity may be sacrificed and even non-syphilitic cases may give a positive reaction, since in this test a very sensitive antigen is used. To read the results in Kahn's test 'sound serological judgment' is required, a quality not easily acquired. Similar defects are present in the other precipitation tests available at present.

A keen sense of observation and judgment has to be possessed by the clinician who diagnoses and treats cases of syphilis. What the tests do is to aid his clinical acumen in determining the syphilitic basis of many disease conditions, confirming suspected cases of syphilis and controlling the treatment of such cases. Laboratory tests can never replace clinical examination and observation in diagnosis. With

proper co-operation and frequent exchange of ideas the physician can obtain the maximum benefit from the serological procedures. The serologist should bestow his utmost care in adhering to the details of technique and in reading the results of the tests he is doing, which should be standard and generally accepted as reliable. The clinician should facilitate the laboratory procedure by taking all precautions demanded in collecting and despatching the blood sample to prevent contamination, haemolysis and error in labelling. Chemical antiseptics and bacterial infection are a common source of anticomplementary results. Haemolysis is also due to similar causes and also to the presence of moisture in the syringes used to take blood. The supply of clinical data with each specimen can make it easy to interpret some of the weak positives, especially in cases undergoing treatment. It will guide the serologist to assay the efficacy of his test and add a human interest to the monotonous mechanical work he is engaged in.

The clinician should be familiar with the principles of all the serological tests and the technique of the particular tests adopted by his serologist. This will enable him to evaluate the results meted out to him for sensitivity and specificity. If it could be helped it is advisable not to change the serologist. The clinician being accustomed to the personal factor and other individual influences of the particular serologist upon the results he caters, will be put out of gear if the serologist is changed.

In the interpretation of results, it should be borne in mind that "no

serological laboratory, no matter how well and conscientiously conducted, is ever *always* right in its positive reports."

Granting ideal conditions in the laboratory where the Wasserman test by one of the recognized methods, and the standard Kahn test have been used, what does a negative blood result mean? Does it mean that the case is not one of syphilis? Not necessarily. Before such a conclusion can be arrived at other diagnostic investigations, clinical and otherwise, must be applied to exclude syphilis. It may be that as in the early stages of syphilis the general tissue reaction against syphilis has not commenced, or that the case is a latent one and the tissue reactions have been feeble or non-existent as in some cases of late syphilis and hereditary syphilis. A darkground examination of the serum from the primary sore and a quantitative blood or spinal fluid examination respectively may reveal the leucic infection in most such cases. The serologically negative late syphilis case may develop neurosyphilis sooner or later and demands continuous observation of the patient with frequent blood and spinal fluid examinations. If the patient refuses "the blood is on his own head."

The 'doubtful' blood result is sometimes a vexation to the clinician especially when there is no clinical evidence observed. The blood in such a case should be repeated after "a provocative dose" (the blood being taken after 48 hours and at the end of a week after the injection). If it is then negative the patient should be frequently observed over

long periods. In treated syphilis, if the treatment had been regular and thorough, a "doubtful" result is an evidence that the disease is getting under control and the clinician can hope to obtain a "negative" result at the end of the course. An early reversal of a "positive" to a "doubtful" or "negative" result may mean that the treatment has not been thorough and regular. It should not be taken as an indication for ceasing or slackening treatment. The reaction may become positive again if the treatment is slackened or ceased.

A positive reaction *one plus* or *two plus* does not indicate the degree of infectivity of the patient. It means in cases of recognised syphilis that the tissues are reacting against the spirochetes either invasively circulating in the blood or lurking in the deeper tissues where they may be active or quiescent. It is not definitely known whether the positive reaction is always due to the presence of the spirochetes in the tissues or whether the reaction can occur even after the spirochetes have disappeared from the tissues. There are cases in which no amount of treatment may reverse a positive reaction. What is the position of the clinician here? The exact nature of serological reaction not being known, the clinician has to leave the patient alone after the authorised course of treatment, but get him under observation periodically for any reappearance of symptoms.

It is admitted that a few cases occur with absolutely no evidence of syphilis either clinical or that can be guessed from the family history, in which the blood gives a

positive serological reaction. These cases remain a mystery and will remain so until we know more about the true nature of the Wasserman reaction.

In a considerable number of cases where the Kahn test has not revealed the existence of syphilis the Wasserman test has revealed it. The converse is also true. Thus it would appear that the ideal thing to do is to perform both the tests on every blood. It forms a mutual check on the two tests. In the case of spinal fluid the Wasserman test is the easier and surer method. The globulin fraction which contains the reagin is present so little in the spinal fluid that it is not easily detected by the Kahn test. By using graded quantities of the spinal fluid in the complement fixation test, the presence of the syphilitic reagin has been revealed in most cases in which the nervous system has been involved. The results have agreed with the other evidences, *viz.*, the increase of globulin, increased cell count and the colloidal gold curve.

A positive cerebrospinal fluid has not much value unless given quantitatively, (the other reagents remaining the same, the cerebrospinal fluid in different tubes with graded volumes, and the results given accordingly, *e.g.*, with 0.1 c.c. negative, and 0.5 c.c. positive). The result should always be interpreted in association with the globulin estimation, the cell count, and the colloidal curve.

Most of the unsatisfactory results are due to imperfections in the technique of withdrawing, collection

and transmission of the spinal fluid. If the first few drops are let out, blood staining of the fluid may be avoided. By sterilizing the container properly contamination may be avoided. Contamination will mean an anti-complementary reaction. For doing a cell count it is necessary that the fluid be examined in an hour or two after it is drawn. In the tropics the disintegration of cells may begin early. If immediate transmission is not possible the fluid should be preserved in the refrigerator. Cerebrospinal fluids sent from distant stations necessitating transmission by post have rarely been satisfactory for testing. The test tubes or other containers with the corks or stoppers should be thoroughly sterilized, and the

fluid should be quickly transmitted. Then better results may be expected.

Though a positive result of the cerebrospinal fluid may mean in most cases evidence of neurosyphilis, a negative result may not mean absence of the same. The fluid has to be examined periodically in every case of syphilis undergoing treatment or going to be treated.

Typical colloidal curves like 5553210000 or 0013422000 are rarely false and may be taken as clear evidence of syphilis. Curves, with figures below 4 in all the tubes have to be interpreted with clinical evidence. In all such cases repeated examinations may have to be done to watch for the typical curves.

Clinical Memoranda

A CASE OF OVARIAN TUMOUR IN A MALE ADULT

REPORTED BY DR. A. N. VERGHESE, L.M. & S., D.M.O., NELLORE.

I. *Family History*.—Born as twins, both male, he lost his twin brother after 3 months of birth. He has two sisters alive both older. One of them is a nullipara and the other is a mother of three grown-up children. He has an elder brother alive who is married and lives with his wife, but has no children.

II. *Personal History*.—The patient is a young adult male of 21 years, muscular, strong, and well-built, with plenty of hair on the chest and other parts of the body. He grows a moustache. Pubic hair is abundant and well spread out. He regularly shaves his face and has a cropped head. The penis is well developed and of normal size. The scrotum is of normal size. The right testis is absent now but he says it occasionally comes down and goes up. The left testis is in the scrotum but is small and embryonic and has no testicular feel. The perineum is normal and the median raphe is properly developed. There is no shred of evidence in this region to suggest a condition of hermaphroditism. He is not yet married but has been living with a woman for the past few months. He has been having illicit coitus and states he enjoys the act as any other man. He definitely states he gets emissions of semen.

For the past one year, he has been having a sort of pain round about

and below the umbilicus. No medicine was taken for the trouble. But whenever the pain came on, he used to roll up a cloth and lie prone on it and thus get relieved. Recently, a tumour was noticed, and the pain was naturally attributed to the tumour. The local doctor to whom he went for advice diagnosed the condition as tumour and directed him to the Nellore Government Headquarters Hospital.

III. *Condition on admission*.—No albumin or sugar in urine. Patient quite healthy. Has no pain. A fairly big tumour was found to occupy the region below the umbilicus in the central position. First appearance would have suggested an over-full bladder. Urine was drawn. The tumour persisted. It was very movable and could be easily pushed up to either hypochondrium, but always returned to occupy the usual position described. Provisional diagnosis was tumour of the mesentery. It was hard to feel and not cystic.

IV. *Operation Notes*.—Right lower paramedian incision. Tumour easily brought out. It was a surprise to find what looked like an ovarian tumour. A search was made. A rudimentary uterus was seen in the normal place. It had the muscular feel at the fundus, but no cavity, or any sign of an opening leading out was detected. The lower

part of the uterus which is about $1\frac{1}{4}$ " long, consisted only of folded peritoneum and had no musculature. The left ovary was fairly well developed but no fallopian tube or fimbriated extremity was seen. The right ovary had the tumour of the size of a fair-sized unhusked coconut, rather oval in shape. It weighed 6 lbs. For all appearances, it looked an ordinary Adenoma of the Ovary, degenerating in one or two places. The tumour was excised and the pedicle tied in the usual way. The left ovary was not removed. The abdomen was closed in layers. Recovery uneventful.

The case is very interesting as it a very rare one and hence the publication. The man has no external signs whatever, to indicate

the presence of uterus or ovary inside. General development and external appearances fully suggest a man. He lives and behaves like a man and is proposing to get married soon. As shown above, he actually lives with a woman and has illicit coitus with her, indicating he is male, not only in appearance but also in his outlook.

Pathological report of the specimen:—*Embryonal Carcinoma*.

The patient had emissions twice in the hospital with characteristic staining of the cloth and smell. The quantity also was fair. Medical officer in charge is trying to get a fresh specimen of semen and examine for spermatozoa.

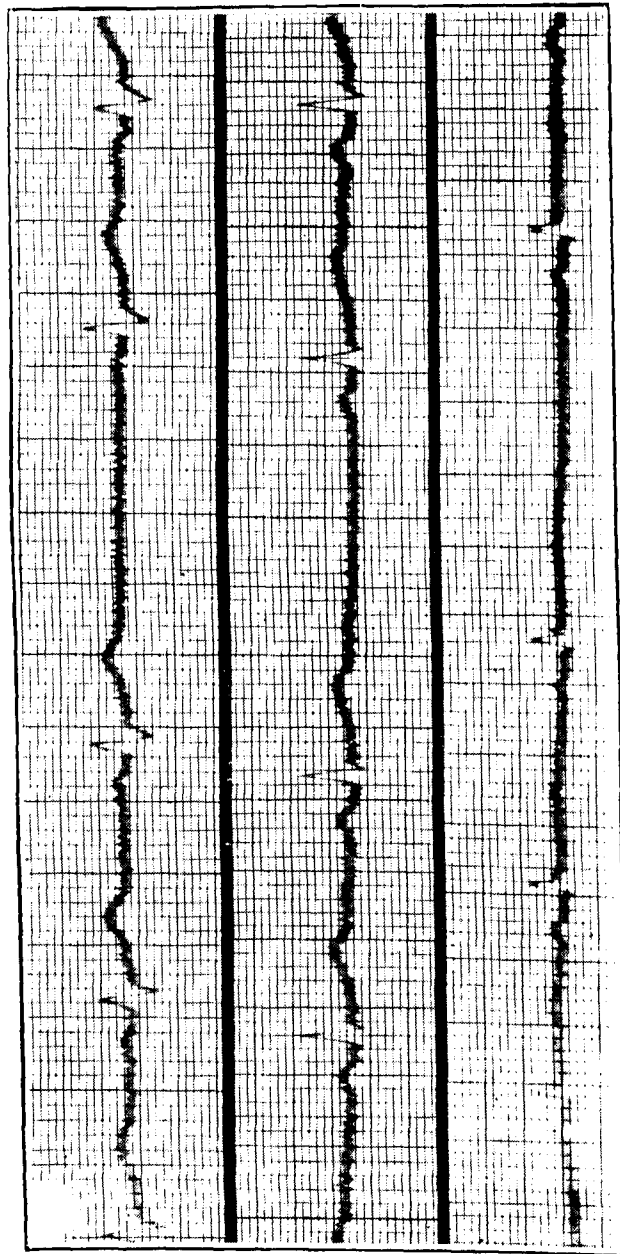
A CASE OF CHRONIC AMOEBIC DYSENTERY CURED BY AMIBIARSON (BRAND OF CARBARSONE)

REPORTED BY R. KRISHNASWAMI, M.B., B.S., DEPARTMENT OF PHARMACOLOGY, MADRAS MEDICAL COLLEGE.

K. Hindu female aged 58 had an attack of dysentery in July 1934. She was passing 7 to 10 motions daily accompanied by intense tenesmus. She was put on injections of Emetine 1 gr. daily for six days, followed by three tablets of Anabin (Kurchi Bismuth Iodide) daily for another ten days. The Emetine could not be continued because of the severe pain caused by the injection. There was no improvement. Bismuth in large doses seemed to have an effect in lessening the number of motions, but the blood and slime were being passed still. After an interval of about two months Yatren both orally and as enema was tried. After three or four days,

the dysentery disappeared, but recurred after ten days. Yatren had no effect after the recurrence. Various lavages, viz., solutions of copper sulphate, pot. permanganate, and silver nitrate, were tried without any effect. The motions were kept in check by large doses of Bismuth. The condition continued for two or three months, when Kurchisol and Isphagula seeds were tried, and these too did not have any effect on the condition. The patient then tried some Ayurvedic remedies, which worsened her condition by increasing the number of motions which were now almost completely composed of blood and mucus. In August 1935, Amibiarson (kindly

ELECTRO CARDIOGRAM.



(Dr. D. G. Reddy's Case).

Showing Sino-Auricular Block.

supplied by the makers, The Bengal Chemical and Pharmaceutical Works, Calcutta, to the Department of Pharmacology) was tried, one capsule (0.25 gramme) twice a day, combined with lavage with Pot. permang. solution. On the seventh day after commencing the treatment, the blood and mucus disappeared from the stools, which were very much reduced in number and on the eighth day the patient passed a formed motion without blood or slime. The drug was continued for another three days and then stopped. She had no recurrence of the trouble till her death in February 1936, due to Coronary thrombosis.

ation of the stools two or three times during the course of the illness failed to show any amoebae, the appearances were very suggestive of Amoebic dysentery. There was no fever during the whole course of the disease.

Another interesting point is that the patient had a tendency to high blood pressure; during the whole course of the illness the systolic reading was 160 mm. When she recovered from the dysentery, it rose to 180 mm., and remained at that level till her death. One is tempted to believe that the continual loss of blood during her illness prevented the blood pressure from rising to dangerous heights.

Even though microscopic examin-

ANTI-DYSENTERIC SERUM AND SERULES

By

CAPT. S. THAMBIAH, M.C., B.A., M.R.C.P. (E.), F.D.S. (LOND.)

I had occasion to treat a few cases of Bacillary dysentery diagnosed microscopically and serologically. A 4-year old patient was reported to be suffering from abdominal pain, frequency of stools, blood in the stools and high temperature and extreme prostration. As I was pre-occupied during the fore-part of the day and part of the evening, I could not see the patient till late in the evening. On my way to the house of the patient, I provided myself with a serule of Anti Dysenteric serum (Behringwerke). After a rapid examination all that I had to do was to release the needle by filing and inject the serum in the lower part of both the thighs. Only milk was interdicted in the diet and patient put on Barley water, Kanjee water and Glucose D added to both

feeds. On seeing the patient the following morning, the little patient had not even passed one single motion. Patient was happy, temperature was normal and the parents were quite impressed with the dramatic cure. Anyway to be on the protective side, a further injection of one serule of 10 cc. was administered. The immediate result is entirely due to the early diagnosis and the serum given within the first 24 hours.

Three cases of old men were treated by Anti-Dysenteric serum during November and December. All of them were above 60 years of age, and none of them could be induced to have the serum by injection, while in the case of one, the question of giving serum had to be

considered as the patient was asthmatic and albuminuric, and the three cases were treated by running in the serum rectally 22 to 40 cc. both morning and evening (after cleansing the lower bowels by a normal saline enema—2 pints), with the former dietetic restriction and in one case a half-filled hot water

bottle to the abdomen to relieve pain; nothing specific was done. Cure was effected in four days.

I am sure the serules would impress all the three concerned—the doctor, the patient and the parents or relations. The serules should be made extensively available.

A CASE OF SINO-AURICULAR BLOCK.

REPORTED BY D. GOVINDA REDDY, M.D., ASST. TO THE PROF. OF MEDICINE, MEDICAL COLLEGE, MADRAS.

Bapi Raju, a Hindu male, aged 28 years, was admitted into the medical wards of the General Hospital, Madras, under Dr. S. Venkata Subba Rao on 9-4-1936, for pain in the chest and palpitation on exertion. The duration of the present attack in its severe form was about fourteen months, and he was having similar attacks on and off, for the last 20 years. When he was 8 years old, he suffered from a short attack of fever.

Personal family history.—Father died at the age of 54 having suffered from an undiagnosed fever. Mother is healthy. The patient is married and has four healthy children. He has suffered from an acute attack of gonorrhoea four years back. He is a vegetarian, and has never tasted liquor or used tobacco in any form.

History of present illness.—He is not able to walk more than a furlong without losing breath. He has palpitations, feels giddy, and his precordial pain is aggravated. These attacks occur both by day

and by night, and last from a few minutes to several hours. He tried various remedies both Allopathic, and Ayurvedic without any benefit. Nine months back he consulted a physician, who advised him to take a little opium. Temporarily it gave him some relief, but at present, he has become a slave to the drug without even that evanescent benefit.

Condition on admission.—A full blooded well built young man with an anxious face, and worried look. He is highly neurotic and intropective.

Physical findings :

Cardio-Vascular system :

Heart Boundaries.

3rd Rib.

Right border of Sternum.		Just outside the nipple line in the 4th inter- costal space.
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Apex beat neither visible, nor palpable. Heart sounds are feeble and irregular. No murmurs to be heard in any area.

Pulse.—64—Volume and tension poor. Occasionally the pulse was missing at the wrist. Simultaneous auscultation revealed missing of the heart beat. There was no jugular pulsation either. The succeeding pulse after the missed beat was not of abnormal intensity.

No cyanosis or oedema of the legs.

Respiratory System.—Nil abnormal.

Alimentary System.—Liver and spleen—normal size.

Tenderness in the epigastric region.

Investigations.—

Urine—Nil abnormal.

Faeces — Do

Blood—Normal.

Wasserman reaction—Negative.

Blood Pressure—Systolic 90, Diastolic 70.

X ray of the Chest.—Slight hypertrophy of the left ventricle.

The left auricle is not hypertrophied.

Electrocardiogram.—A complete heart cycle, 'P Q R S T' missing at irregular intervals.

Progress under Treatment.—

9-4-1936. Day of admission. Roughly every 4th beat at the apex of the heart, and the corresponding pulse at the wrist was missing.

11-4-1936. The irregularity was not so regular. About 15th to 20th beat was missing.

17-4-1936 E. C. G. was taken. Pulse rate 55 and irregular.

18-4-1936. The patient was put on nitro-glycerine tablets—with no benefit.

20-4-1936. Put on Bromides—No improvement.

23-4-1936. Atropine 1/100 gr. injected subcutaneously. After 20 minutes the pulse became definitely fast. The irregularity persisted, but only one to two beats were missing per minute. The patient found no relief.

Differential Diagnosis.—

A missing pulse at the wrist at regular or irregular intervals may be noticed in the following conditions.

(a) *Extrasystoles.*—(commonest condition). These can be of auricular or ventricular origin or more rarely they may start from junctional tissues. If the premature contraction is of sufficient strength, the aortic valves will open and radial pulse, though of feeble intensity, will be felt at the wrist; but if it is of poor intensity, no radial pulse will be observed. In either case confirmatory evidence of an extrasystole may be found easily by simultaneous auscultation, when a premature pair of heart sounds, or in some cases the first sound only is heard.

(b) *Heart block.*—To make sure that a dropped beat is due to heart block, it is necessary to prove that the auricle has contracted, while the ventricle failed to follow suit. Polygraph or electro-cardiograph readings are very useful in determining

this condition. . Where such facilities are not available, it is very difficult to differentiate the condition from sino-auricular block. However very useful information may be obtained by observing the venous pulse in the neck. If it is seen to continue regularly during the radial pauses, as well as immediately before the radial beats, it is safe to assume that the condition is one of auriculo-ventricular block.

(c) *Sino-auricular block*.—Here both the auricle and ventricle fail to contract and thus jugular pulse in the neck, and the ventricular beat at the apex will be missing. The chief clinical feature of this arrhythmia is an irregular or regular dropping of beats. The recognition of this form of irregularity is important for differentiating it from the much more serious auriculo-ventricular block. Such a thing is often possible with the help of graphic records only.

From the clinical findings and electro-cardiogram, the above mentioned case appears to be one of sino-auricular block.

Sino-auricular block.—This is an extremely rare condition, in which, the whole heart misses a beat. A record of only 54 cases has been published by Barlow. P., in *Lancet* 1927 (1). Impulses are being generated regularly in the sinus node, but occasionally an impulse is not transmitted to the auricles, or fails to generate in the sinus node. The whole heart fails to contract for a period equal to two cardiac cycles, and the succeeding impulse from the sinus node is effective at the moment when it is due. (This is well seen

in the accompanying electrocardiogram.)

The etiology of the disease is still in darkness. Experimental production of similar lesions has been invariably a failure. As the connections between the sinus node and auricle are of diffuse nature, this type of block is never apparently due mainly to organic disease. However it seems to occur chiefly due to undue vagal stimulation, and has been occasionally observed in patients who are taking digitalis. This disorder may often be associated with auriculo-ventricular block.

Symptoms.—This condition may not manifest any symptoms. When the block recurs frequently the patient may complain of palpitation. When four or five successive sinus impulses fail to reach the auricle, a prolonged diastolic arrest of the whole heart will occur, and the patient may faint as in Adam-Stoke's syndrome. However one has to bear in mind, that such a condition is very rare, and Adam-Stoke's syndrome mostly occurs in auriculo-ventricular block.

Treatment.—As the condition is one not attended with any symptoms generally, no special treatment is required. If it should occur during digitalis therapy, the drug should be temporarily stopped. Attempts to inhibit undue vagal stimulation with atropine group of drugs seem to have no effect. The patient should be assured that palpitations caused by this condition will in no way interfere with his usual activities.

Prognosis.—If sino-auricular block is not associated with other

cardiac lesions, as auriculo-ventricular block, or cardiac failure, it does not seem to interfere with the usual activities of life.

Importance.—It is important to recognise this lesion, lest it should be mistaken for irregularity due to extrasystoles or partial auriculo-ventricular block, conditions in which prognosis is not good.

My thanks are due to Dr. S. Venkatasubba Rao and the Superin-

tendent of the General Hospital, Madras, for permission to report this case.

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PHARMACOLOGY.

The Antagonism between Ephedrine and Procaine after cisternal injection. (ROBERT ISENBERGER and J. C. RICE. *Jl. of Pharm. and Exp. Ther.* LVI. 307, March 1936).—The efficacy of ephedrine sulphate as an antagonist to procaine hydrochloride was tested by limiting the actions of the drugs partially and temporarily to the medulla. Localisation was accomplished by cisternal injection. It was observed that resistance of the circulatory centres to procaine depression was generally greater than resistance of the central respiratory mechanism. Anoxaemia is apparently the most damaging factor in circulatory depression accompanying procaine respiratory paralysis, and adequate artificial respiration is usually definite protection against this anoxaemia. This contention is supported by the experimental results obtained by Isenberger in which he demonstrated the value of artificial respiration and administration of oxygen in respiratory and circulatory depression following intraspinal and intravenous procaine poisoning. It is evident that ephedrine is antagonistic to procaine by actions other than its peripheral circulatory effects. Certainly it is true that improved circulation from intracisternal ephedrine cannot always be entirely responsible for the early return of spontaneous breathing in animals with respiratory paralysis induced by intracisternal procaine. Ephedrine stimulated nervous structures

subserving depressed reflexes almost instantaneously in these experiments. The authors believe this direct stimulation of the nervous centres of the medulla by ephedrine to be important. Intravenous ephedrine fails to abbreviate respiratory paralysis induced by intracisternal injection of procaine.

It is suggested that intracisternal ephedrine would be of value in the treatment of emergencies involving serious depression of the vital centres.

Some experiments with Protamine Insulate. (R. D. LAWRENCE and NORA ARCHER, *B. M. J.*, April 11, 1936, p. 747.) Protamine Insulate is a compound recently obtained by Dr. Hagedon and his colleagues in Denmark, which by virtue of its slow solubility in the tissue fluids is slowly absorbed. The advantages claimed are: (1) its prolonged action, which can therefore keep the blood sugar normal for longer than ordinary insulin. It is stated to act twice as long and a normal fasting blood sugar can therefore be obtained before breakfast. (2) A reduced liability to hypoglycaemia because of its slower and less violent action. The disadvantages pointed out are (1) the instability of the compound for more than 3 to 4 weeks, (2) its inability to control the hyperglycaemia following on carbohydrate meals. The authors' clinical findings and their conclusions are: (1) Protamine insulate acts more slowly and for a much longer time than ordinary insulin,

and a large dose can act for more than two days. (2) It is much weaker in dealing with carbohydrate food and usually cannot prevent hyperglycaemia after meals. In contrast, its action on endogenous sugar is nearly as rapid and good as ordinary insulin. (3) It causes less symptoms of hypoglycaemia than ordinary insulin, even at the same blood sugar concentration. Protamine insulate is certainly absorbed more slowly from the subcutaneous tissue. It therefore has qualities which promise great use in severe diabetes with oscillating blood sugars and rapidly recurrent ketosis. On the other hand, it is not strong enough in its action to control ingested carbohydrates, so that the use of ordinary insulin before carbohydrate meals and protamine insulate in the evening has been advocated and is necessary to obtain full control of the diabetic condition.

THERAPEUTICS.

Treatment of Lung Abscess and Gangrene by Sodium Benzoate. (L. GOLDKORU, *Presse Medicale, Paris*, 43, 2094, Dec. 1935).—Immediately after intravenous administration of a sufficient dose of Sodium Benzoate, a curious phenomenon is noticed. The patients notice an odor both sudden and agreeable. They also have a feeling of heat in the chest and head. This proves that the Sodium Benzoate has a definite affinity for pulmonary tissue. Its elimination by the air passages is a symptom of saturation. As a result of 2,200 intravenous injections the author feels that the optimum drying and antiexudation dose corresponds ex-

actly to the dose that produces the aforementioned symptoms. The effect of any treatment on pulmonary abscess is difficult to evaluate and consequently only chronic and acute abscesses with progressive pulmonary destruction were used in evaluating the result of treatment. Two cases of chronic abscess and one of large, acute, destructive abscess were treated in this manner and are reported in detail. In five cases of bronchiectasis also a diminution in the quantity of sputum was observed. The smallest dose for pulmonary abscess is 20 c.c. of a 20 per cent solution each day. When symptoms of saturation are not produced by this dose larger doses are indicated. The technique of injection is important. It must be made slowly and 20 c.c. should take five minutes. Daily injections are given. In acute cases 15 injections are usually enough, but in chronic cases about 36 are generally necessary.—(*Abs. J. A. M. A.*)

Malaria in control of Atrophy of Optic Nerve. (C. P. CLARK, *Arch. Ophth. Chicago*, 15, 250, Feb. 1936) reports 12 cases in which syphilis of the central nervous system was present with syphilitic invasion of the optic nerve and visual pathways. There were 8 patients with tabes and 2 each with dementia paralytica and dementia paralytica of the tabetic form. The condition of 8 patients improved under therapy. One of the 8 patients was treated by injections of typhoid vaccine intravenously because she was resistant to the strain of the organism of tertian malaria used; the other seven were treated with induced malaria. There was no improvement in four of the patients, and the ocular condi-

tion continued to progress until blindness resulted. This was to be expected owing to the advanced state of atrophy of the optic nerve present before treatment. The state of the pupils was unchanged in all 12 patients. If invasion of the optic nerves and visual pathways has taken place it is prudent to treat the patient as early as possible with malaria. Malaria does not possess magic power to restore function to an optic nerve with advanced atrophy of the tissue, but induced early it enables the natural barriers to syphilis to be established before vital tissue has lost its function. The optic nerves, chiasma and optic tracts are involved by the same meningeal infiltration that is largely responsible for the damage of syphilis to other structures. When this infiltration is arrested before maximal damage has occurred, the decline of vision is halted and the patient is saved from blindness. Additional factors probably play a minor part in the defence developed against the spirochete after malaria: vasodilatation and increased metabolism. For some patients there is a mild hyperaemia of the optic discs during the paroxysms of malaria. The factors of fever, vasodilatation, increased body metabolism and stimulation of the reticulo-endothelial system appear to be the means by which malaria and other acute febrile diseases offer to the body an effective defence against syphilis of the central nervous system.—(Abs. J. A. M. A.)

Effect of Liver Extracts in Experimental Amoebiasis. (J. A. M. A. Editorial 106, 1094, 28th March, 1936).—The elucidation of the role of dietary factors in the

control of intestinal amoebiasis is an important problem. The investigation of Faust and his collaborators have demonstrated the ameliorative effects of feeding raw liver or powdered liver extract to dogs infected by intracecal inoculation of *E. histolytica*; in some cases complete eradication of the protozoon occurred with this treatment alone. However, the nature, identity and mechanism of action of the substance in liver responsible for these effects is not known. The active material is destroyed by heating in an autoclave at 17lb pressure for 20 minutes; it is apparently present largely if not chiefly in the liquid fraction of raw liver. Dessicated stomach has no ameliorative effect (but actually a deleterious effect) unless it has first been treated in an autoclave. The identity of the active substance with the anti-anaemic factor has been questionable. Recently Faust and Swaitz-welder have investigated the effect of purified liver extracts administered intramuscularly on experimental amoebiasis in dogs. Contrary to the effects of feeding liver or liver fractions, the extract administered intramuscularly failed to control the infection although the R. B. C. count was increased.

Treatment of Bacillary Dysentery. (F. G. HONSMAN, *Klin. Med.* Nov. 1935, p. 1611) recommends the treatment of bacillary dysentery by laxatives, arguing that bacillary dysentery is not a form of diarrhoea but is more accurately regarded as constipation accompanied by an elimination of mucus. He therefore begins treatment with a dose of 3 grs. of calomel and this is followed

by a similar dose two hours later. Four to six hours after the second dose of calomel the patient is given an ounce of castor oil, and on the next day he receives an ounce of sodium sulphate (anhydrous) dissolved in a tumblerful of water. This is sometimes followed by haemorrhagic motions, which are of no importance. The abdominal pains and tenesmus usually disappear quickly but occasionally there may be abdominal pain during the action of the salt, which can be relieved by a dose of tincture of opium and tincture of belladonna, aa 20 minims. During this treatment the patient must take no food but he is given plenty of weak tea (without milk) sweetened with sugar. As much as half a pound of sugar may be given in twenty-four hours. The tea may be flavoured with lemon or red wine. The author considers the administration of bismuth in dysentery as useless and irrational, while the regular administration of opiates is harmful. He claims that by his treatment he has abolished the mortality risk in bacillary dysentery, but it must be begun early. It is not appropriate to amoebic dysentery.

In a survey of the *Progress in internal medicine in GASTRO-ENTEROLOGY in 1934* in the *Arch. Int. Med.*, LVI. 4 (Oct. 1935) 797-830, GARNET CHENEY of San Francisco reviews a number of papers on **recently introduced medical treatment of chronic peptic ulcer of the stomach and duodenum**. Treatment of peptic ulcer with *gastric mucin* was first reported five years ago and has been widely taken up since. The clinical

results in 555 cases studied by questionnaires issued by the Gastric Mucin Committee of the Northwestern University Medical School have been published by Fogelson (*Arch. Int. Med.*, LV. 7, Jan. 1935). The gastric mucin dispensed for treatment has had to meet rigid requirements of standardization by the committee since 1931. The conclusions are: (1) Of 493 patients with peptic ulcer treated throughout the United States, all symptoms were controlled in 70.5 per cent, partial relief was obtained in 23 per cent, and failure occurred in 6.5 per cent. (2) Of 217 patients with intractable ulcers, 69 of whom had submitted to previous surgical procedures, gastric mucin afforded complete relief in 63.1 per cent, partial relief in 29.4 per cent and no relief in 7.5 per cent. (3) The results in this group of patients with intractable ulcer suggest the possibility of obtaining symptomatic improvement with gastric mucin when accepted orthodox measures have failed. (4) The permanence of the results is not considered, because of the limited period of observation. The physiological basis of mucin treatment is its experimental reduction of the concentration of gastric enzyme.

In the latter part of 1933 Meyer and Seidmon and Necheles (*Illinois Med. J.*, LXIV. 339, 1933) reported on the treatment of seventeen patients with ulcer with a preparation of powdered *okra*, a vegetable mucin. Fourteen noted immediate relief, which was all the more striking as no other forms of treatment were employed.

Bulmer (*Lancet*, II. 1276, 1934) reported the results in 52 unselected

cases of peptic ulcer in which the condition was treated by the parenteral injection of *histidine*, one of the amino-acids. Aron and Weiss had shown that the formation of experimental ulcers in dogs could be prevented by injections of histidine and had obtained excellent relief of symptoms in 17 cases of peptic ulcer so treated. Bulmer's immediate results showed symptomatic cure in 58 per cent of cases and failure in 23 per cent. In a follow-up study, 3 patients were found to have a relapse.

[The Council of Pharmacy and Chemistry of the American Medical Association would not accept histidine (Heffmann-la-Roche's Larostidine brand) for the New and Non-Official Remedies because "it is marketed with unwarranted therapeutic claims" (Jour. Amer. Med. Assoc., CVI. 17, April 25, 1936.) In the same issue of the Journal Sandweiss describes 60 per cent of freedom from symptoms (12 out of 20 cases,—5 after the first and 3 after the second injection) with control injections daily of 5 c.c. of distilled water to compare with relief with histidine in 55 per cent. of 40 cases. Of 24 of these in whom the symptomatic improvement was checked either by X-ray or operation after histidine treatment, not one showed disappearance of the ulcer deformity. Other reports on histidine are not so damaging, some are in fact very promising. But Hurst and Bennett do not seem to be well disposed towards it. It looks altogether that histidine treatment may be a useful adjunct to the orthodox measures in selected cases.]

During a six year period at the Wurzburg Clinic, Engel studied the effects of *foreign protein therapy* in gastric and duodenal ulcer. He administered a plant albumin intravenously in a selected group of 70 cases in which there had been no response to the ordinary dietary regimen. A few patients had chills, fever and vomiting. 58 per cent became symptom-free, 30 per cent were improved and only 12 per cent remained completely unchanged.

Cunha (*Am. J. Surg.*, XXIII. 219, 1934) reports his experiences with the use of a proprietary preparation containing lipoproteins and emetine. The lipoprotein is stated to have a tendency to decrease gastric peristalsis, arrest pylorospasm and promote healing of the local lesion. Emetine relaxes smooth muscle and has antibacterial properties. 51 patients were completely examined and carefully followed, 29 cases for 1 year. Each patient received one ampoule of the solution mentioned intravenously every fourth day for ten doses. No reaction appeared. A dietary regimen was followed for four weeks. In all but 2 patients complete relief from pain occurred promptly, and healing of the ulcer was promoted, as noted by roentgen examinations.

Sandweiss and Meyers (*Am. J. Digest. Dis. and Nutrition* I. 338, 1934) have tried bacterial vaccines as a form of foreign protein therapy in cases of peptic ulcer. They used a mixed respiratory vaccine in 33 cases of intractable ulcer and treated patients in a total of 48 attacks. Remission occurred in 70.9 per cent, but in about one-half of these symptoms recurred in less than three months. Only 1 per cent was symptom-free 36 months later. A second course of treatment was likely to give either relief for a short time or none.

Glaessner has long advocated an original conception of the cause of peptic ulcer on which he has based his "*specific therapy*." The normal balance between the pepsin of the gastric secretion and the anti-pepsin of the wall of the stomach is upset, with a definite diminution in anti-pepsin, and the resultant digestion

of the gastric mucosa and formation of ulcer. The *parenteral injection of pepsin* will stimulate the formation of anti-pepsin in the stomach, restore the balance and promote healing of the lesion. Excellent results followed in 50 per cent of one series of 1,000 patients, and good results in 50 per cent of another series. A special dietary regimen was included as a part of the therapy.

Einsel, Adams and Myers (*Am. J. Digest. Dis. and Nutrition* I: 513, 1934) have contributed a report on *aluminium hydroxide* in the treatment of peptic ulcer. In colloidal form it reduces the emptying time of the stomach, lowers gastric acidity and is devoid of deleterious side-effects. Acidity again increases when alkali therapy is discontinued.

Jones (*ibid*, p. 135) discusses the use of *insulin* in the treatment of peptic ulcer. The rationale of this form of therapy is apparently based on the author's familiarity with pertinent investigations in some of the Russian clinics. He states that insulin increases the secretion of the stomach, which assumes an inert type, and that insulin has the properties of a powerful alkali. There is a lowering of vagotonus, thus removing the manifestations of spasmophilia. Jones treated 26 ambulatory patients, injecting, on the average, from 20 to 30 units of insulin daily. They were allowed their customary food and were required to take 100 G. of mashed potatoes at each of two main meals. Of the 12 patients with fresh peptic ulcer, all but 1 were symptom-free in 10 days. All gained weight. After 10-15 days roentgen examination revealed no definite signs of

ulcer. Satisfactory improvement with partial relief from pain and gain in weight and well-being occurred in the 8 cases complicated by perigastritis and adhesions. In some cases the ulcer had been recalcitrant to other forms of treatment. The author noted a change from the vagotonic type of stomach to normotonus and also an increase in gastric secretion with a corresponding improvement in appetite; at the same time there was a decrease in gastric acidity.

All the cases of ulcer which have been studied at the Peter Bent Brigham Hospital during the 19 years of its existence have been studied as regards the results of treatment, which have been of some type of *Sippy regimen* or some form of surgical procedure. Emery (*ibid*, p. 520) has analyzed 1,253 cases out of a total of 1,435. Nearly all of these have been followed for over one year, and 333 for six years or longer. A striking feature is the small number of cases in which there was complete relief of symptoms. Only 13.7 per cent of the patients receiving medical treatment and 19 per cent of the patients receiving surgical treatment were relieved, while 23.8 per cent of the patients receiving no treatment were symptom-free after leaving the hospital. On the other hand, almost half the untreated patients remained unimproved. Medical treatment resulted in a higher percentage of "satisfactory results" than surgical methods and the complete Sippy regimen was 90 per cent satisfactory. Too much attention is paid to the healing of the ulcer and not enough to prevent a relapse after healing has taken place. Emery found the

causes of relapse, in the order of their greatest frequency, to be fatigue, emotional disturbances and recurrence of infection. In only 37 per cent of cases were dietary indiscretions mentioned as a cause of relapse.

There is an increasing appreciation of the need for continuous treatment of peptic ulcer, as of diabetes and addisonian anaemia, and for individualization in the supervision of each case. To prevent accidents and to ameliorate the complications is the role of medicine after surgical intervention.

Note:—

For the sake of completeness it has been thought fit to refer to the sodium benzoate treatment of gastroduodenal ulcer and Muelengracht's treatment of haemetemesis and melaena with food.

C. Godoy writes of the sodium benzoate treatment in the *Medicina Contemporanea*, quoted by the *Jour. Amer. Med. Assoc.*, C. 19, May 13, 1933. The course consists of 40 daily intravenous injections (Bazano's) of 2 cc each of a 25 per cent solution of sodium benzoate in distilled water, patient being at complete rest and ordinary diet. Healing is consolidated by 10 more injections on alternate days. The first injections are immediately followed by a painful sensation at the site of the ulcer and also by a sensation of warmth in the stomach and in the entire abdomen. Pain and vomiting usually disappear after the sixth injection. The heartburn is the last symptom to disappear.

Muelengracht (*Lancet*, 1935, ii, Nov. 30, 1920) treated 251 cases of

haemetemesis and melaena due to peptic ulcer with varied food from the very first day, and plenty of it from the day after admission: a full puree diet, together with a teaspoonful three times a day of a mixture of 15 G. of sodium bicarbonate, 15 G. of magnesium subcarbonate, 0.13 G. (2 grains) of extract of hyoscyamus, and $\frac{1}{2}$ gr. of iron lactate. The puree diet included tea, white bread and butter at 6 a.m., oatmeal with milk, white bread and butter at 9 a.m., dinner at 1 p.m., cocoa at 3 p.m., and white bread and butter and sliced meat, cheese and tea at 6 p.m. The dinner included a variety of dishes: meat balls, timbale, broiled chops, omelette, fish balls, vegetable gratin, fish gratin, mashed potatoes, vegetable purees, vegetable soups, cream of vegetables, stewed apricots, apple sauce, gruel, and rice and tapioca puddings. The patients are allowed to have as much as they wish. In 12 cases in which large quantities of blood had been lost one or two blood transfusions were given. There were 3 deaths, one of perforation, one immediately after admission, one after erosion of an artery after seventeen days. In Muelengracht's experience patients with haemetemesis and melaena do not usually die until some time—on an average eight days—after the haemorrhage begins. Death is not due directly to loss of blood but rather to general exhaustion, often with complications.

S. K. S.

MEDICINE.

In the course of "A critical Review of the Literature on Chronic Rheumatism." JOSEPH L. MILLER, CHICAGO (*A. I. M.*

57: Jan. 36, 213), (says:—Clarke J. T. (*J. Trop. Med.* 33, 249, 1930) has made a complete review of the incidence of acute rheumatic fever in the tropics. He practised for 33 years in India and during this period examined 150,000 patients, but he never saw a patient with mitral stenosis, acute rheumatic fever or chorea. He also registered the births and deaths for a period of years. In 97,000 death certificates, acute rheumatic fever was never recorded. Clarke has carried on correspondence with pathologists in the tropics, one of whom had performed 600 autopsies and had never noted mitral stenosis.

Who is this Clarke, one wonders, who was in India for 33 years and missed a whole generation of mitral stenoses?!! (*Ed.*)

PATHOLOGY.

The presence of *Infective Leishmania Donovanii* in the Urine and Prostatic Fluid of Patients with Kala-Azar. (CHIA—TUNG TENG AND CLAUDE FOKUER, (*Chinese Med. Jour. Suppl.* p. 394, 1936)—In view of the recent revival of interest in the theory of direct transmission of this disease and because of conflicting findings in literature, further studies by means of animal inoculation, were conducted to determine whether or not viable parasites may be found in the urine of patients suffering from kala-azar. The results of the experiments are summarised below:—(1) Intraperitoneal injection of the centrifuged sediment of urine from 3 to 13 patients suffering from Kala-azar resulted in infection with *Leishmania donovani* in Chinese hamsters. The duration of symptoms in each of these 3 patients was 1½, 12 and 18 months respec-

tively. (2) Prostatic fluid from 1 to 2 such patients was shown in a similar manner to contain infective *Leishmania donovani*.

GYNAECOLOGY.

The treatment of Dysmenorrhoea with Insulin.—ALEX, ALTSCHUL. (*J. A. M. A.* April 18, 1936, p 1381).—In a group of 12 patients, all nulliparae suffering from primary or essential dysmenorrhoea, ten received practically total relief from menstrual pain by using insulin (15 units or so daily) from 3 to 7 days before or during the period. One patient obtained relief in one period with one type of insulin and no relief during another period with another type of insulin. Another patient was only partially relieved. Not every brand of commercial insulin contains the activating substance necessary to be effective in this condition. Insulin has been used in gynaecology for various haemorrhagic conditions with interesting results. Abel in experiments on animals, reported a long oestrus pause with a decrease in the number of follicles and an increase in the corpora lutea. Poulain-Landrien mentions the beneficial uses of insulin in various uterine haemorrhagic conditions and also mentions its use as of value in some cases of dysmenorrhoea. In order to avoid the criticism that the stimulation of sex development and function with the use of insulin was due to improvement in diabetes, G. A. and R. L. Williams report a case of striking acceleration of body growth and sexual development in a non diabetic girl aged 8½ years. The effects disappeared when insulin was discontinued.

Ovarian Hormones in Therapy (H. J. W. HUNTER, *B. M. J.*, April 11, 1936).—Kaufmann of Berlin had been able in 1933 to convert the atrophic endometrium of a castrated woman into a functionally active state, and later, by supplementing the follicular hormone used with corpus luteum hormone, to produce the premenstrual state and a subsequent menstrual flow. It had been found that at least a million units had to be injected intramuscularly, and since only 1/30 of an oral dose was effective it was clear why the oral administration of this hormone in the past had proved quite inadequate. In primary amenorrhoea it was often possible to enable the uterus to grow to normal size with subsequent menstruation by giving one or two million units intramuscularly of the follicular and corpus luteum hormones. Bleeding might be produced by the follicular hormone alone, but this was merely diapedesis of blood from an interval mucosa and not true menstruation. Dr. Hunter had treated two cases successfully according to Kaufmann's method, but so far there had been no permanent restoration of menstrual function.

In secondary amenorrhoea all general causes must first be excluded after which menstruation can in most cases be restored by the complete course of injections or by follicular hormone alone. Sometimes the restoration appeared to be permanent. In oligomenorrhoea or scanty menstruation with symptoms of ovarian deficiency, much benefit was often derived from one or two courses of follicular hormone; the scanty flow returned to normal, the menopausal symptoms disappeared, and the

patient felt better generally. If there was associated sterility pregnancy might ensue. The injections should be given in the first half of the intermenstrual period, namely, during the proliferative phase. In cases with very severe menopausal symptoms complete relief might be obtained by weekly doses of 500,000 units of the follicular hormone, but in milder cases much smaller doses might suffice. Kraurosis vulvæ with associated pruritus often improved after a course of injections with follicular hormone, when all other treatment had failed to give benefit. A dose of 1 to 2 millions units of dimenformen might be necessary to give relief, but thereafter the dose could be reduced. Acne rosacea could be similarly treated. In cases of habitual abortion due to deficiency in corpus luteum secretion a daily injection of corpus luteum during the first three or four months, with the usual precautionary routine in cases of threatened abortion would often prove successful, but the treatment was very expensive. In adolescent and menopausal menorrhage the underlying factors were excessive production of follicular hormone with deficiency of corpus luteum hormone, the result being failure to convert the proliferated endometrium into the secretory phase with casting off of the endometrium. In the first instance corpus luteum injections would often produce an immediate cessation of bleeding, and less frequently the same result might be obtained in cases of menopausal bleeding. If a large persistent follicle was threatened, hormone treatment was quite inadequate. Follicular hormone was of no benefit in spasmodic dysmenorrhoea, but it might be worth while to try an intramus-

cular injection of 50,000 units of dimenformen before the onset of a period.

Cobra Toxin as analgesic in Gynaecologic Carcinomas. (J. NEKULA, *Zentrbltt. f. Gynak.*, Leipzig 60, Feb. 8, 1936).—

Nekula tested the analgesic action of cobra toxin in ten patients with genital carcinoma. He says that the cause of the analgesic action of cobra toxin is not definitely known as yet but that it is probably the result of a paralytic effect on the sensory nerves. The toxin of Indian cobra is used for analgesic purposes because it contains the most neurotoxins and at least haemolysins of any snake venom. The author obtained a reduction of pain in all 10 cases in which he employed the cobra toxin, and in 2 cases he was able to suppress the pain completely. He injected the toxin subcutaneously in the region of the deltoid muscle. For the cutaneous disinfection alcohol was used, never Tr. of Iodine. It is stressed that the simultaneous internal medication with iodine is likewise inadvisable. With regard to the dosage he says the best results were obtained when small doses of 10 m. u. were administered every second day. In this manner it was possible to avoid the general reactions in the form of gastro-intestinal disturbances, and the reduction in pain was continuous. This was not possible when the injections were given at intervals of 3 or 4 days. The author administers the cobra toxin always after radium or X-ray treatment, never simultaneously with it. He points out that cobra toxin is now also used for therapy of cancer and mentions some of the investigators

in the field. He admits he himself never observed an objective improvement of the local gynaecologic condition. Nevertheless he thinks that in future snake venoms might be of greater importance in the direct action of cancer tissues than in their analgesic action.

Endocrine Form of Dysmenorrhoea—S. J. ESSENSON. (*Med. Record*, Jan. 1, 1936, p. 11) is convinced that cases of dysmenorrhoea which are not of the mechanical, obstructive, inflammatory or pelvic types are attributable to an endocrine disturbance, and he cites five case histories in support of this contention. The appropriate treatment comprises the administration of follicular hormones, hormones of the anterior pituitary and ovarian substance, provided that the local conditions, such as severe constipation, overwork, nervousness, and psychic affections, anaemia, and sometimes obesity, are corrected. Aututrin—S and theelin succeed in some cases but not in all, and have then to be followed by progynon B. Essenson emphasises the importance of reaching a correct diagnosis of the underlying state, since dysmenorrhoea is but a symptom. The exciting cause is often complex and faulty habits of life are apt to become superimposed on a deep seated endocrine imbalance. Correction of the former without attention to the latter will be disappointing.

OBSTETRICS.

An Early Diagnostic Sign of Pregnancy (L. POULIOT, *Bull. Soc. d'Obst. etc., Paris*, Dec. 1935, p. 615) has found the pupillary reaction of Bercovitz to be of great value as

an early diagnostic sign of pregnancy. The test consists in instilling into the conjunctival cul-de-sac of one of the eyes of the patient one or two drops of a mixture of 1 c.cm. of her blood and 0.2 c.cm. of a 10 per cent sodium citrate solution. In positive reactions this is followed in two minutes by a slight miosis (in 60 per cent of the cases) or a slight mydriasis which lasts for about five minutes. 44 patients gave a positive reactions, and each was ultimately proved to be pregnant; in 2 cases a negative result at first was followed by a positive one two weeks later. Pouliot states that the diagnosis of pregnancy has sometimes been made very early by this test, in one case on the eighth day. Negative reactions have always been obtained in males and in non-pregnant females. He remarks that the mechanism of this reaction is unknown; the substance in the blood causing it is certainly not folliculin, but it might be adrenaline or an allied substance. Two precautions are necessary in performing the test; there must be no pupillary inequality, and any black dye on the eye lashes must be removed, since if it is projected on to the eye ball a painful irritation results. A positive reaction is an almost certain sign of pregnancy. A negative one, without clinical signs of gestation gives little information; at least a second menstrual period has been missed. He has found some evidences to support the view that a negative reaction during pregnancy indicates probably retention of a dead foetus.

MEDICO-LEGAL.

Seminal Stain Examination
(FRANK W. MARTIN writes in the

B. M. J., May 16, 1936.)—"In order that a definite opinion may be expressed that a stain is one from seminal fluid, it is essential that complete spermatozoa be found on microscopical examination. For medico-legal purposes, especially for production in court, a photomicrograph should be always made of the slide. The following procedure gives excellent results, and being rapid in execution saves much time, since both crystals and spermatozoa are shown at once, and may be photographed. The stain should be first extracted in 0.3 per cent acetic acid, in which it should soak for at least two hours. A drop of the stain extract is placed on a slide, and one drop of Lugol's solution added. The slide is then examined under high power. If the stain be seminal crystals appear almost at once, and spermatozoa if present, stand out prominently. The photomicrograph ought to be taken at once because semen crystals rapidly disappear."

SURGERY.

Progress of Surgery during 1935. DONALD BALFOUR, H. K. GRAY and H. A. STUART, *International Clinics*, Vol. 1, 1936, p. 274. (Abstracted).

Anaesthesia.—The important advances have been in (1) the value of barbiturates as general anaesthetics for small operations, (2) the usefulness of cyclopropane which is especially valuable in pulmonary disease, since a high percentage of oxygen may be used with it, (3) the increased usefulness of sacral block anaesthesia, whose scope has been increased by the use of larger injections of the anaesthetic agent in the

caudal canal. Instead of the usual 30 c.c. of a 1 per cent solution of procaine, as much as 75 c.c. have been used, allowing a "soaking" period of at least half an hour, and (4) the relative safety of spinal anaesthesia when its contra-indications are recognised. The tendency here is towards a more conservative selection of cases and recognition of definite contra-indication, such as, involvement of central nervous system pernicious anaemia, marked secondary anaemia and debility.

Neuro-surgery.—Without doubt the most fascinating development in neuro-surgery is that of the surgical approach to the treatment of essential hypertension. Pieri and Rossi attacked the splanchnic nerves at first by the supra-diaphragmatic approach, and later by the sub-diaphragmatic approach. This year, Adson proposed and used a technique whereby he sections the splanchnic nerves, first and second lumbar ganglions, and a portion of the supra-renal gland. The incision is a modified high kidney incision and gives excellent exposure. Careful selection of cases is essential. Patients in the third and fourth decades of life, whose arterial elasticity has been little impaired, respond best to surgical treatment. Promptly after operations systolic B. P. is capable of dropping from 270 mm. Hg or more to 100 mm. Sudden and abrupt peaks of B. P. no longer occur. Clinical improvement is more manifest than mere drop in B. P. Retinal haemorrhages, spasm and papilloedema often disappear, cardiac and renal function also improve.

The management of brain abscess is in a state of confusion. Doubts are

cast as to when to drain an abscess and regarding the procedures. A study of 92 cases by Adson and Craig showed that the mortality dropped as soon as the surgeon delayed drainage until encapsulation took place; in cases of abscess of temporo-sphenoidal lobe, there was a lower mortality when drainage was made through a clean field in the temporal area than when it was made through a suppurating mastoid wound; the sealing of the meninges and cortex above the drainage tract to prevent contamination has improved convalescence and lowered mortality. When cerebral abscess follows infection about the ear, with conflicting signs of localisation, it was found advisable to follow the rule of exploring the temporo-sphenoidal lobe before exploring the cerebellum or the side of the infected ear because of the higher ratio of abscesses in the sphenoidal lobe than in the cerebellum.

In cerebral trauma, Fay has felt that surgical decompression is justified in cases of acute cerebral injury only as a matter of last resort, and that when physiological methods of decompression fail, operative decompression fails also. As a general rule, in cases in which the spinal fluid is bloody, surgical interference should be deferred as long as possible.

Peet presented fourteen cases of complete cure of glosso-pharyngeal neuralgia by intracranial section of the ninth nerve. The approach was made through a U-shaped incision midway between the mastoid and the middle line, posteriorly.

Thoracic surgery.—Pulmonary lobectomy: technique for this opera-

tion has advanced and it may be done in one stage or in multiple stages. The mortality is less in the latter case. Lobectomy in two stages consists (1) in the production of adhesions over the lobe adjacent to the one to be resected, which acts to prevent the spread of the pleural infection following the second stage of the operation, and (2) ligation of the hilum of the diseased lobe with a special automatic ligating instrument, the lobe then being resected distal to the ligature, the incision in the thoracic wall closed and the residual pleural space drained by an air tight tube.

Pneumonectomy in one stage seems to be the method of choice for malignant lesions, whereas multiple stage operations are more desirable for bronchiectasis. The fact that 11 patients have survived the period of surgical convalescence after resection of an entire lung for malignancy has stimulated interest in the early diagnosis of bronchial carcinoma.

Abdominal surgery.—Gastro-jejunal ulceration still presents an interesting problem. Statistics are quoted for the occurrence of secondary ulcers after different operative procedures. Balfour recently reviewed results obtained from the surgical treatment of chronic duodenal ulcer in 1,086 consecutive cases in which the patients were traced for 7 years or more. In 90 per cent excellent results were obtained and without necessary dietary restrictions. In 10 per cent residual symptoms ranged from occasional discomfort, readily controlled by medical management, to reactivation of the original ulcer or anastomotic ulcer. When gastric acidity was 70 or more, relief of

symptoms after gastro-enterostomy occurred in 82.4 per cent of cases whereas when acidity was less than 30, 90.5 per cent of patients were relieved. The incidence of jejunal ulcer in these two groups is, respectively, 4.4 and 2.7 per cent., but Balfour does not feel that this discrepancy warrants the general replacement of gastro-enterostomy by plastic operations on the pyloric outlet or by partial gastrectomy. His results indicate that in gastroduodenostomy, with or without partial excision of the pylorus, the symptomatic results are considerably less satisfactory than with gastro-enterostomy, and also the incidence of recurrence or reactivation of duodenal ulceration is greater than incidence of jejunal ulcer following gastro-enterostomy.

Haemorrhage from ulcer continues to be a difficult surgical problem. Local excision of the ulcer, if feasible, combined with gastro-enterostomy, seems to be the method of choice.

The question of what surgical procedure to adopt in the presence of a gangrenous intestine is difficult to answer. Amendola's statistics show a 75 per cent. mortality in 28 resections. Resection requires a lengthy anastomosis, which seems to be too much for a patient already labouring under the toxæmia of accompanying strangulation.

Orthopedic surgery.—The respective merits of open and closed reduction of congenital dislocation of the hip have been reviewed. The salient points are that: (1) closed reduction should not be used for children more than three years of age and (2) closed reduction even

in the early group, is not successful in so many cases as open reduction, but in cases in which reduction is accomplished by the closed method, the end results are the most satisfactory.

Hyperpyrexia is a very effective method of treatment in cases of gonorrhoeal arthritis, but has little or no effect in the usual cases of atrophic arthritis.

Coley has reported results from the treatment of Ewing's sarcoma by means of a mixture of cultures of *Streptococcus erysipellatis* and *Bacillus prodigiosus*. He concluded that (1) irradiation as the primary method of treating operable endothelioma of the long bones should be abandoned, (2) although some exceptional results obtained in a few cases of inoperable endothelial myeloma might seem to justify an attempt to save the limb, the actual results of such conservative treatment have been poor. Early amputation followed by prolonged treatment with his toxins would seem to be the method of choice.

Ewing warned against surgical biopsy of bone tumours. The risk of metastatic dissemination does not warrant open biopsy. The needle aspiration method presents less danger if biopsy is to be done.

Rogers has reported a study of 31 cases of fracture of vertebral bodies, in all of which patients were treated by his method of immediate reduction on a hyperextension frame. Bony union across line of fracture occurred and seemed adequate in 2 to 7 months.

Coonse and his co-workers have presented interesting findings on

traumatic shock. They noted that this differed from haemorrhage shock in that it is characterised by increasing acidosis and a relative increase of serum over blood cells. The effects of slow haemorrhage, however, resemble more closely those of traumatic shock, showing depression of the higher centres, increasing anaemia of tissue, and acidosis. Laked blood and traumatised muscle seem to be factors producing toxic depressant effect on vital centres. Beneficial results have been seen from intravenous injection of a 5 per cent solution of sodium bicarbonate.

Urological Surgery.—Higgins found that when albino rats were kept on a vitamin A deficient diet for 250 days vesical calculi developed in 85 per cent of cases and renal calculi in 42 per cent. Infection of bladder or kidney occurred and alkaluria was a constant finding. Addition of vitamin A to diet caused urine to turn acid and calculi were not produced. Administration of cod liver oil to rats with calculi caused disappearance of calculi in 11 out of 12 rats. These and similar findings have led to the recommendation of an acid ash diet rich in vitamin A as prophylactic to prevent recurrence of stones in patients. In 18 cases of renal calculus treated like this complete solution of stones occurred.

Wharton noted the unsatisfactory results from surgical treatment of renal tumours, which he ascribes to the exceedingly friable nature of these tumours and the manipulation needed for their removal by a posterior approach encouraging metastasis by way of blood stream.

He advises pre-operative irradiation and use of anterior transperitoneal approach, whereby the pedicle may be ligated before manipulation of tumour is attempted.

Waters is of opinion that tumours of the hypernephroma type and embryonal carcinomas are radio-sensitive whereas papillary carcinomas of renal pelvis and malignant papillary cystadenomas are radio-resistant. Reduction in size of radio-sensitive tumour begins almost immediately following X-ray therapy. Operation should be done in several weeks after either the first or second series, depending on the response of the tumour. Retrograde pyelogram helps to distinguish between pelvic and cortical tumours in 80—100 per cent of cases and 94 per cent of all cortical tumours are radio-sensitive.

Engel and Foley state that in the majority of cases, ureteral stones should be removed by open operation. Manipulative procedure often cause chills, fever, and marked prostration, and in addition, ureteral stricture from the associated trauma might occur.

Morphine has been found by Ockerblad and others to increase markedly ureteral tone and amplitude of contractions, the larger the dose, the greater being the effect. Atropine eliminated the ureteral contractions stimulated by morphine but was inconstant in effect when given alone.

Thompson reported a series of 630 further cases with prostatic obstruction treated by the trans-urethral method. Epididymitis occurred in only 8 of the 630 cases.

Strict attention to methods of drainage by urethral catheter, rather than routine vasectomy, minimised this complication.

J. C. D.

A Summary of regional ileitis.

BY A. J. ROSENBLATE, A. A. GOLD-SMITH, AND A. A. STRAUSS, CHICAGO. *J. A. M. A.* cvi 21 (23-5-36) 1797.—For the past three decades a number of granulomatous conditions of the intestine, possessing common symptomatic and pathologic features, have been described. Clinically and microscopically they were mistaken for malignant conditions, but, on microscopic examination, proved to be benign, inflammatory lesions. They were also frequently mistaken for appendiceal conditions.

It was not until 1932 they were described as a distinct entity by Crohn, Ginzburg and Oppenheimer *J. A. M. A.* cix: 1323-28, Oct. 15, 1932) as "regional ileitis." A year later Harris, Bell and Brunn (*Surg. Gynec. and Obst.* lvii. 637-645, Nov. 1933), because of the cicatrizing, inflammatory process and the probable involvement of other portions of the intestinal tract, suggested the term "cicatrizing enteritis."

No definite etiologic factor or factors have been isolated. Infection has been thought of as a possible cause, especially certain of the other anaerobic groups. The disease occurs most frequently in young adults, more commonly in male. However cases have been reported from the ages of 4½ to 40 years. The usual site of disorder is the terminal ileum, although other portions of the intestine may be involved.

The pathologic condition is "one of proliferation of the haemopoietic cells, and mainly proliferation and irritation of the somatic cells of the intestinal wall." (Kantor, J. L., *Regional ileitis: its roentgen diagnosis*, *J. A. M. A.* ciii: 2016-21, Dec. 29, 1934). The picture is that of inflammation of the iliac mucosa with subsequent ulceration. The intestinal coats are oedematous and thickened. The mesentery is thickened, and the glands are hyperplastic. Eventually, owing to the fibrostenotic process, narrowing of the lumen occurs. There is a marked tendency towards perforation, and the formation of a localised mass in the right iliac fossa and of a fistula into the adjoining intestine. Microscopic section reveals acute, subacute or chronic inflammatory reactions. Giant and epithelioid cells are present in the later stages.

Clinically, the condition presents the following symptomatic characteristics:

Fever, generally low (highest 103 F), fluctuating with periods of normality.

Diarrhoea, one or two stools daily, contain mucus and at times occult blood.

Anorexia, with progressive loss of weight, secondary anaemia and malaise.

Pain, dull and cramplike, in the right lower quadrant. If an ileosigmoid fistula exists, the pain may be felt in the left lower quadrant.

Leucocytosis, moderate.

Pulse, rapid.

Stenosis, manifested by constipation with some vomiting, distension, and a palpable mass in the right lower quadrant.

Roentgenologic investigation is the most essential means of establishing a diagnosis and, in conjunction with the clinical symptomatology, makes a rather definite roentgen picture.

Kantor summarises the roentgen technique and his observations as follows:

The usual oral opaque meal is employed, as well as a barium sulphate enema. Serial observations are made at hourly intervals from the period just before the caecum fills to the normal period of emptying. This is about three to nine hours after the ingestion of the opaque meal. The patient is then permitted to partake of an ordinary meal as soon as the stomach is empty.

The abnormalities as revealed by the roentgenologic studies, may be either in the ileum of the colon or both. The changes in the latter may be reflex nature—that of a secondary spasm—or may show actual progression of the disease from the ileum.

The principal changes in the ileum, briefly, are:

(a) filling defects just proximal to the caecum.

(b) abnormality in contour of the terminal coil of the ileum.

(c) dilatation of ileac loops just proximal to the lesion. (This is demonstrable in the stenosis phase.)

Kantor describes a roentgenologic sign which, though not pathogno-

monic of the disease, is strikingly suggestive and characteristic. He called the "string sign," a thin, slightly, irregular linear shadow suggesting a cotton string in appearance and extending from the region of the last visualized loop of ileum through the entire extent of the filling defect, and ending at the ileocaecal valve. It represents the attenuated barium filling of the greatly contracted intestinal lumen. Weber has recently offered the term "twisted cord appearance" an alternative for "string sign."

The absence of the string sign does not exclude the disease. In such an instance an effort should be made to demonstrate the filling defects in the terminal ileum and the result accepted as a suggestive finding.

Several other conditions may confuse both the roentgenologist and the clinician and necessitate a differential roentgenological and clinical diagnosis. The string sign has been observed in sarcomas and syphilis of the terminal ileum. A filled appendix dipping into the pelvis may likewise be confusing.

Clinical differentiation includes ulcerative colitis, syphilitis, lymphosarcoma, intestinal or mesenteric tuberculosis, Hodgkin's disease, actinomycosis or malignancy of the terminal ileum, and appendiceal disorders.

Medical treatment is usually unsatisfactory. Surgical intervention is the treatment of choice.

Then follows a convincing case report, with a typical clinical and roentgenologic picture of regional ileitis, with added involvement up to but not including the distal portion of the transverse colon. The authors suggest the term "ileocolitis ulcerosa chronica."

It looks as if some otherwise unexplained conditions involving the right lower quadrant may have to be thought of as "regional ileitis." One has seen roentgenological pictures closely simulating Kantor's description. One has however to resist the temptation to make too ready a diagnosis of a new disease one has read of.

S. K. S.

Current Topics.

PHILIPPINES.

The Control of Leprosy.

The current issue of *Leprosy in India* contains the report of the recent Philippine Leprosy Commission, appointed as the result of public agitation against the anti-leprosy measures used in the islands. Besides having interest as an account of the methods of control and treatment used in another country, the report serves to emphasise to what extent present knowledge of the disease is incomplete or purely speculative. There are many points connected with its transmission which are still obscure. Children are apparently most readily susceptible. Two members of the Philippine Commission put forward the view that children alone are susceptible—if this could be proved, control would be greatly simplified; but the weight of evidence appears to be against them. There is no procedure by which a susceptible person can be immunised against the disease. Once acquired, the disease is incurable. In many cases, however, its progress can be arrested and the patients rendered non-infective—although there is always a danger of relapse. There are other cases, commonly known as "burnt out", in which the disease has run its course. To this category, the majority of the leprosy beggars seen on the streets in India belong. It is generally believed that such cases are non-infectious. The two doctors already referred to believe, however, that no case ever ceases

to be infectious, and, unfortunately, nobody can prove them wrong, although, again, the weight of general testimony is against them. It used to be believed that infection was the result of a long period of contact, but now opinion is reverting to the older view that the period of contact need be relatively brief. The statistical position is also discouraging. Although, until recently, in this country nothing more than a vague guess could be made at its prevalence, and even now estimates are probably wide of the mark, the general belief is that the disease is as prevalent as ever it was. There is, however, comfort in the fact that, as methods of treatment and control produce greater confidence and more patients come forward, while there will be an increase in the recorded incidence the prospects of a future reduction will be greatly improved.

There is, indeed, in spite of the depressingly small extent of exact knowledge of the oldest disease known to mankind, reason to believe that progress is being made on the right lines. If more money were available and public co-operation were forthcoming the disease might be stamped out in one or two generations. So far as is known, lepers are the only carriers of leprosy. Direct contact is necessary for infection, and the chances are that an adult who has grown up in a country where the disease is endemic will remain immune. There is also evidence to show that children born of leprous parents are not infected

before birth. Thus the problem reduces itself. If every leper could be discovered and every positively infectious case kept out of contact with children, or, preferably, completely segregated in leper colonies, great strides would have been taken towards the eradication of the disease—or, if that is putting it too high, towards testing the correctness of present theories.

It is significant that, in the Philippines, the greatest value is attached to segregation. In India recently, there has been a tendency to place less emphasis on segregation. This may be understood, because the cost of complete segregation of all lepers would probably be prohibitive. There is the difficulty also that the adoption of a known policy of segregation tends to intensify the leper's desire to conceal his condition. He dislikes the idea of being separated from his family and friends. Failing complete segregation, a modified form of segregation in the leper's own home has been considered. The Philippine Commission have little faith in this system. If, however, segregation in leper colonies is impossible, this should be one means of reducing the number of contacts made by an infectious case. It would not be practicable in all circumstances. It could not be applied, for example, in houses or huts with only one room. In some cases where it is not possible to segregate the leper even partially, it might be found possible to remove children from all danger of contact. Wherever possible, some form of segregation should be introduced. Treatment without segregation may be ultimately effective for the individual, but nothing

will be done to stop the multiplication of infection in the intervening period. Obviously, if India is to tackle the problem seriously, it will have to be prepared to spend a great deal more money on control measures than it has done hitherto.

Madras Mail 26-5-36

LEAGUE OF NATIONS.

GENEVA, May 26.

There are 30,000 confirmed drug-addicts in Great Britain, according to a report of the Opium Section of the League of Nations. The report, which was first published, was later withdrawn because, it is understood, some Governments complained to the League Secretariat of the greatly over-estimated number of addicts in their countries.

The report states that it is believed that the annual consumption of drugs by addicts in Great Britain amounts to five tons, giving an average daily consumption of three grains per addict. The world contains over two million addicts, according to the preliminary figures, not taking into account the multitudes of opium-smokers in the East.

The United States authorities calculate that 120,000 confirmed addicts exist in their country, consuming some twenty-five tons annually—an average daily consumption of six grains. These figures, it is stated, are the result of the roughest calculations, but it must be remembered that this is the first time an attempt is made to work out any estimate of the magnitude of the problem with which the League's Anti-Opium Committees are trying to cope.

EGYPT

Ruses of Drug Addicts.

Twenty-nine persons of British nationality have been listed as "big dealers" in illicit drugs in 1935 in the annual report of the Central Narcotics Intelligence Bureau, issued by the Egyptian Government, as compared with 17 in 1934. Forty-two Italians and 56 Greeks head the list. The report was prepared by Russell Pasha, British Director of the Bureau and Commandant of the Cairo City Police, who for seven years has been fighting the drug menace in Egypt.

The report gives details of secret agents, plots and counter-plots, intercepted letters, code words, guilty footprints, mysterious meetings in coffee-houses and launches "shadowing" suspicious ships at night time—all elements of a first class "thriller." The ingenuity displayed by the smugglers and traffickers is equalled only by the brilliant work of the detectives.

The hiding places of drugs included chickens' gullets, strips of false skin superimposed on a man's leg, the screw-cap of a walking stick and corn cobs. One of the traffickers concealed a quantity of heroin in his daughter's "innocently dangling" curls, another put dope between the inner and outer soles of the boot and a third put opium in his horse's fodder bag, a fourth put hashish inside Turkish pastry and a fifth actually arranged that the milkman should deliver opium to his clients with their morning's milk.

The total number of arrests was 4,176 as compared with 4,086 in

In one province of China, the police use dogs which are able to smell opium even when the man is carrying it carefully concealed, according to the Chinese delegate to the Opium Advisory Board Conference, now meeting at Geneva. Asked what breeds of dogs were employed, the Chinese delegate stated that the dogs were mostly Alsatian police-dogs or native Chinese dogs. These were promptly named Chinese Opium Hounds by the Advisory Board.

New Drug.—One of the sensations at the Board's session has been the discovery of a new drug, announced by Mr. S. F. Fuller, the American delegate, who referred to it as the "World's deadliest." The effects of the drug, which is named Dihydrodesoxymorphine, are said to be more terrible than those of Heroin.

Factories for the illicit manufacture of drugs are known to exist in the Balkans, while reports have reached the Committee that many other factories, especially those supplying the United States and Canada are situated in the Far East. The traffickers are now relying more on their own concealed factories, it is stated, since the previous Drug Conference, held under the League's auspices, made it nearly impossible for them to obtain supplies from officially licensed factories.

The problem of illicit manufacture will be handled at the World Opium Conference, meeting at Geneva on June 8.—*Reuter.*

The Hindu 2-6-36.

1934. The total seizure was 1,654 lbs. compared with 2,589. The plight of addicts is shown by the fact that several have spent thrice their income on drugs, finding the extra money by parcelling out bits of their property and by theft. A contractor has been found to be paying his labourers small packets of heroin instead of wages. Fifteen deaths were reported in 1935 as compared with 4 in 1934 and 63 in 1930, but the figures stated are not necessarily complete.

The disturbing feature, according to the report, is the fact that many traffickers, who were sentenced in 1930 (when the clean-up began), are due to be released, and it is feared that they may resume their old practices. "I fear," says Russell Pasha, "that widespread addiction would start in the country if illicit drugs were again available and if wages rose to former levels." There are now about 400 addicts and 3,000 imprisoned traffickers as compared with 5,000 and 1,000 respectively in 1929.

The cinemas in Cairo and Alexandria are arranging lantern lectures in the outlying villages to proclaim to the people the evil of taking drugs.—*Reuter*.

LONDON

INDIAN MEDICAL DEGREES

British Council's Recognition

In his presidential address at the summer session of the General Medical Council which opened at 44, Hallam Street, on May 27, Sir Norman Walker made an important

statement upon the recognition by the Council of qualifications granted by Indian universities.

Tracing the recent history of medical education in India, he said that the council was given, by Part II of the Medical Act, 1886, the duty of ascertaining the sufficiency of the examinations leading up to the qualifying examinations. This part was applied to India as a whole in 1892, and before 1920 the Executive Committee of the Council had accepted for registration the degrees and diplomas of the universities of Bombay, Calcutta, Lucknow (Allahabad), Madras, and the Punjab. In 1921 a questionnaire was addressed to these five universities, and the replies showed that the teaching of midwifery did not, except in Madras, reach a standard which would be recognised by the council for a university in the United Kingdom.

In order to solve a question which was admitted to be difficult, he had accepted an invitation from the Secretary of State for India to proceed to India and discuss the difficulties with the authorities there. In his report he had expressed the opinion that each of the universities could bring its regulations sufficiently into accordance with the requirements of the council for the United Kingdom to enable the council to continue to recognise its diplomas. The India Office had appointed Colonel R. A. Needham, Deputy Director-General of the Indian Medical Service, as inspector of medical teaching in the universities, and for four or five years, acting on his careful and conscientious report, the council had continued to recognise their degrees. On revisiting India in

1926 at the invitation of Lord Birkenhead, then Secretary of State, added Sir Norman Walker, he had found that progress had been made, and not least in the department of obstetrics.

Reverting to the present, he remarked that Bombay had, in the Ness Wadia Maternity Hospital, the best maternity hospital he had seen anywhere, which dealt with an even larger number of cases than the Rotunda in Dublin. He had found evidence of general improvement almost everywhere.

In September 1933, a medical council of India had been constituted by Parliament on lines similar to the British council, with representatives of the Government, the universities, and the practitioners, and with Mr. Farquhar Macrae, formerly Inspector of Surgery and visitor for dentistry, as secretary. The India council which now inspected and visited the Indian universities, had forwarded reports on Bombay, Lucknow, Patna, and Madras, and the executive committee of the general council had resolved that the degrees of M.B., B.S., granted by the Universities of Bombay, Lucknow, and Madras, together with other qualifications granted by the Universities of Bombay and Madras which were previously registrable, should again be recognised for registration if granted on or after February 25, 1930; and that the degrees of M.B., B.S., granted by the University of Patna should be recognised for registration if granted on or after May 11, 1935, the date on which that university was included in the first schedule to the Indian Medical Council Act, 1933.—(*The Hindu* 3.6.36).

HEALTH OF MADRAS AND CALCUTTA COMPARED

The publication recently of the Report of the Health Officer of Calcutta for the year 1933 affords an opportunity to compare infantile mortality and child welfare work in the two cities. The first thing that strikes one is that whereas the Annual Report of the Health Department of the Corporation of Madras for 1933 was published in 1934 the Report of the Health Officer of Calcutta does not reach us until the middle of 1936. Calcutta is a bigger city, but it also is a richer city and has bigger resources in staff and equipment. It would seem, therefore, inexcusable that its annual health report is not published until more than two years after the year to which it has reference. Madras leads in this respect.

Calcutta
She also leads in respect of antenatal and child welfare work. She can, too, claim a lower infantile mortality rate. In 1933, an abnormal year for Madras, the infantile mortality was 264.3 per 1,000 as against 236.5 in 1932. In Calcutta in 1933 the infantile mortality rate was 266 per 1,000 as against 234 in 1932. In both cities the 1933 rate was higher than the average of the quinquennium. The Calcutta Health Officer says 5 out of 14 deaths of infants occurred amongst premature weak babies. The principal causes of deaths amongst newly born babies are obviously the result of pre-natal influence. Poverty, which is the direct cause to so many women being illfed and badly housed, ignorance, child-marriage, the rigorous purdah system, etc., all combine to undermine the health

of the mothers and weak premature babies are the result." The Health Officer of Madras, writing about the same year's infantile mortality in this city comes to much the same conclusions. "Infantile mortality," he says, "is always high in a community with a very high birth-rate. The problem is complicated by two factors in Madras, viz, the utter poverty and the consequent low standard of living of a very large section of the population and the extremely unsatisfactory housing conditions of the poor classes. Nowhere is the evil effect of an insanitary dwelling more keenly felt than in the case of a newly born baby." Madras is endeavouring to remedy the housing problem by the provision of model dwellings. Progress is slow because even a minor improvement costs a very large sum of money, and the Councillors are naturally reluctant to increase the burden of taxpayers at a time when all communities are seriously hit by the prevailing depression.)

"The fundamental point to grasp is that far more children are born in the city year after year than can be warranted by the economic condition of the majority of the parents," adds the Madras Health Officer. The resultant wastage of infant life is appalling. The same may be truly said of Calcutta. Something should be done to prevent such wastage. In Madras, public opinion is awakening to the need, and we do not doubt that in Calcutta too similar influences are making themselves felt. Meanwhile efforts are being made in both countries to lessen the wastage by assisting pregnant mothers both

before, during, and after delivery. In this work Madras is far ahead of Calcutta. or was in 1933 and there has since been no indication of rapid development in Calcutta. During 1933 14,948 cases of labour, 52.4 per cent. of the total births in the city, came under the care of the Corporation's Child Welfare Scheme. In Calcutta, the Maternity Units delivered 6,912 cases. In addition Lady Doctors in Madras paid 15,554 visits. The Lady Health Visitors in Calcutta, who are qualified medical women, personally delivered 200 cases, and looked after 6,843 babies registered in the Baby Welfare Register. The Child Welfare Staff in Madras comprises 13 Lady Doctors, 82 Midwives, and 31 Health Visitors. In Calcutta there are 5 Health Visitors, 2 Sisters and 20 Midwives formed into 7 Maternity Units under the direct control of the Corporation. The results this relatively small staff obtain are satisfactory, but the meagreness of their numbers is no credit to so wealthy a municipality. We should have thought Calcutta would have done better than this.

Madras leads, too, in the supply of milk given to needy children. In this city 454 babies received free milk supply during the year as against 626 in the previous year. The fall in number was due to the decision to compel mothers to send or bring children to the centre for feeding. A similar requirement is enforced in Calcutta where in the same year 304 babies were supplied with milk daily, and given baths and treatment for minor ailments. The Lady Superintendent, Madras Child Welfare Scheme, commenting on the work of the year says: "This

Scheme itself has to keep on improving and it can only be done when the handicaps to the successful working of the Scheme disappear with increasing confidence in its work." The Health Officer, Calcutta, makes no comment, but doubtless he is of a like opinion. It is interesting to find that in concluding her report for the following year 1934, the Lady Superintendent, Madras, remarks: "The Lady Doctors on the whole have been doing work which deserves appreciation, educating the indigent and illiterate mothers. They got into the heart of the slums and gave talks on Hygiene and on various subjects relating to maternity and child welfare." We do not doubt that the general public is appreciative of this work. The growing attendance at the Centres proves that those directly benefited by it appreciate it, and we do not doubt that the Corporation will continue to regard this Department as one deserving of the utmost possible encouragement. It has set a standard which cannot allow to fall, and has given its northern contemporary a lead.—(Madras Mail.)

EXTRACTS FROM THE ANNUAL REPORT FOR 1935 OF THE BRITISH EMPIRE LEPROSY RELIEF ASSOCIATION—GOVERNING BODY OF THE INDIAN COUNCIL.

Since 1925, when the association was inaugurated in India, its task has been to make known to the people generally the latest results of the scientific investigations into the diagnosis and treatment of leprosy and to educate them as to the

methods by which the disease might be prevented. A corollary to these efforts has been the provision for a more and more intensive research work, preparation and publication of a variety of propaganda material, training of doctors in the latest methods of the treatment of leprosy, carrying out survey for ascertaining the incidence and endemicity of the disease, establishment of segregation camps, treatment centres and clinics and to carry out other cognate activities. The result of all these endeavours has been an intensification of interest amongst doctors, social workers and others in the problem of leprosy. The pages of the "Leprosy of India" are full of results of experiments in the administration of treatment, of exchange of views and comparison of notes all pointing to the fact that leprosy and the leper are steadily coming under greater medical control.

The Indian Council has continued to follow the policy of the same division of work and its revenues between the headquarters and its provincial and state branches as in the previous year. During the year 1935 the revenue derived from the capital fund amounted to Rs. 1,11,696 and other income from the sale of propaganda material, etc., to Rs. 3,706. Of this Rs. 60,450 were distributed to the Provincial and State branches and Rs. 54,491 were spent by the Headquarters on objects narrated in the following paragraphs.

Research.—The research work has been carried on at Calcutta by our association in co operation with the School of Tropical Medicine

and the Indian Research Fund Association.

The Leprosy Clinic.—The clinic at the Tropical school has been maintained during the year. It is impossible for the clinic to treat all the hundreds of leprosy cases which come for diagnosis every year and a large number of patients are referred elsewhere for treatment. The clinic provides clinical material for research work and instruction.

Diagnosis.—During the year 1,686 patients have attended the Leprosy department for diagnosis. These cases were dealt with as follows:—

Definitely diagnosed as leprosy	1,386
Kept under observation	38
Diagnosed as other skin diseases	212
Ceased attendance before diagnosis	50
Total ...	1,686

Of the other diseases mistaken for leprosy the commonest are syphilide, tinea, dermal leishmaniasis and leucoderma. Of particular interest in diagnosis has been a number of cases of Bernhardt's disease (neuritis of the lateral femoral cutaneous nerve) in which because of the impairment of cutaneous sensibility on the outside of the thigh, leprosy had been suspected.

Treatment.—During the year 924 patients have received treatment for leprosy. The routine treatment of the clinic consists of (a) general treatment for any complicating

diseases and (b) treatment of leprosy by the intradermal or intramuscular injections of hydnocarpus oil or esters. The results of treatment have been fully discussed in the previous annual reports, and the results this year are similar. In many patients slow but steady improvement is seen; in others there is little actual improvement but the progress of the disease is arrested; only a few patients become worse while under treatment; some infectious cases have been rendered non-infectious. In addition to the routine treatment, experimental treatment is carried on in certain selected cases. The principal work of this nature has been the investigation of the use of 'Leprolin' in the treatment of leprosy. *Leprolin* is an emulsion of *lepra bacilli* prepared by a special method from the nodules of leprosy patients, and contains a roughly standardised number of *lepra bacilli*. The cases treated with *leprolin* have been chiefly early cases of nerve leprosy with a fairly marked response to leprolin as shown by the leprolin test. The early results of treatment have been favourable. In most of the cases the lesions have become much less marked and the signs of the activity of the disease have often disappeared within a comparatively short period, but the later results of the treatment have not been nearly so satisfactory. A considerable number of patients in whom after leprolin treatment the disease showed no signs of activity, were kept under observation, and later, lesions were found to have spread beyond their original limits and new lesions have appeared. Further work on this subject is necessary, but it seems to be possible that the early

beneficial results are merely due to local reactions at the site of injection into the lesions, and that there may be no specific action on the bacilli or on the lesions themselves.

Electric treatment by diathermy has been continued and is found to be of considerable value in the treatment particularly of inflammatory conditions arising in the nerves as the result of leprosy, treatment being followed frequently by the relief of pain, by the subsidence of inflammation, by the diminution of sensory and paralytic changes in the distribution of the nerves.

In an out-patient clinic the facilities for operative work are not good, but from time to time operations have been done, the chief operations being for removal of nerve sheaths of severely affected nerve in order to relieve neuritis and possibly prevent the development of deformities. In one emergency case tracheotomy was performed for laryngeal obstruction due to leprosy.

In connection with the work of the clinic a great deal of routine laboratory work was done. This consists chiefly of examinations of smears for *lepra bacilli*. In addition the Kahn test and sedimentation tests are performed in selected cases. Visits have been paid by a trained doctor to the homes of the patients attending the clinic. This is done with three main objects.—

(a) To detect any other case in the family or contacts.

(b) To trace out the source from which the disease has been contracted.

(c) to instruct the patient and the patients' relative how to prevent the spread of disease in the family.

It has been possible by these methods to detect many hitherto unsuspected cases and to get some infectious patients isolated.

Pathology, Bacteriology, Rat Leprosy, etc.—Biopsy material taken from patients has been examined histologically and bacteriologically in many cases. As a result of this work carried on for years a fine selection of sections of lesions of all kinds has been accumulated and a much increased knowledge of the pathological processes underlying the disease and of the factors involved in the production of the various clinical forms of leprosy has been obtained.

Attempts to culture *M. leprae* and *M. leprae muris* have been continued. In view of the fact that it has not been possible to get any cultures of these organisms, and to verify the reports of successful cultures made by other workers, research work has been done, during the year, on a subject which has hitherto received little attention, namely, the application of tissue culture methods to leprosy, research by the use of growing tissue as a culture medium for the leprosy organisms working chiefly with rat tissues and *M. leprae muris*. Rat tissues '*in vitro*' have been cultured and infected with *M. leprae muris* and efforts made to demonstrate multiplications of the bacilli in the tissues. A few encouraging results have been obtained, but on the whole no definite proof of multiplication of the bacilli has yet

been found. It has been possible to keep infected tissues living for only about 16 days and as this may not be a sufficient period for multiplication to occur, experiments are being made with improved methods of tissue culture in the hope of keeping tissues alive for a longer period.

A thorough study of rat leprosy has been completed and a lengthy review will shortly be published. Emulsions of rat leprosy organism are being used to test the bactericidal effect of certain preparations on the leprosy organisms. Certain workers have reported that, judging by the staining reactions of the bacilli, *sodium thiosulphate*, even in weak solutions, markedly affected the bacilli and possibly killed them. Rat leprosy emulsions have therefore been treated with sodium thiosulphate for various periods in varying strengths, but no evidence whatever of any bactericidal activity has been found. Solutions of ten per cent. acting for 24 hours did not kill the organism, for subsequent injections of the treated bacilli into rats produced the disease. Attempts are, however, being made to immunise rats against rat leprosy by a course of injections of rat leprolin and to treat rat leprosy by injections of rat leprolin.

Propaganda, etc.—During the year, Dr. Santra, the propaganda officer, visited various provinces and he reports as follows :

“The work done may be grouped under the following heads:—

1. *Special investigation.*—Attempts were made in various areas

to study the incidence of the disease in children and its progress in them and in adults not receiving treatment. An investigation was made in the Salem District into the following points:—

(a) The incidence of the disease.

(b) How does it spread?

(c) Age and sex in relation to type.

(a) *The incidence of the disease.*—This has been worked out in small areas in Salem District, from the results of which an idea of the incidence may be obtained.

Government figures for Salem District according to the census of 1921. 400 or 21 per 100,000.

Government figures for Salem District according to census of 1931. 1,064 or 43·7 per 100,000.

Heath figures completed in 1932. 3,668 or 150. 71 per 100 000.

Known cases registered in clinics up the end of 1934. 20,381 or 837·35 per 100,000.

The distribution of the disease varies from taluk to taluk, from village to village, and in different quarters in the same village. It does not seem to depend on climatic conditions. The incidence in the village surveyed vary from 0·25 per cent to 9·5 per cent and it appears to depend more on the habits of the people congestion and the prevalence of infectious diseases. The incidence among the school children, who may be said to have come from better homes, is similar to

that noticed in healthy villages. The incidence amongst 5,119 students examined was 0·37 per cent.

(b) *The Spread.*—In some villages the disease is as old as the village, but in many instances the history of the spread could be traced. It must be remembered that the village people are ignorant and generally are not interested in an etiological investigation. Therefore in the course of the work no leading questions were put. If there was an idea that the information given was not correct the investigation was not proceeded with. It may be of interest to mention that in a certain village the caste section with its population of 634 had only 28 name variations, and thus it was difficult to trace reported cases.

(c) *Age and sex incidence in relation to type.*—The figures collected show that the number of male adults is three times the number of female adults, but in childhood the numbers are roughly equal. The males show a greater proportion of infectious cases than the females. On the whole the number of non-infectious cases is about three times the amount of infectious cases. The figures tabulated according to the age of patients and type of disease suggest that signs of nerve that leprosy show themselves commonly in childhood and that as the infected children grow up, some of them develop the cutaneous type of disease while others do not, the disease remaining in form of nerve leprosy or else showing spontaneous arrest.

2. Survey work. 3. Visits to Leprosy clinics and leper asylums. 4. Lectures and demonstrations to medical students and doctors.”

Training of doctors.—A special course in the diagnosis and treatment of leprosy was held at the school tropical medicine, Calcutta, from 11th to 23rd November, which was attended by seventeen doctors from various parts of India and one from the Seychelles Islands, bringing the total of doctors trained at Calcutta to 765 to the end of 1935. These doctors have in turn trained numerous doctors locally, in addition to those who have received similar training from the propaganda officer of the Indian Council during his tours of inspection. The Madras presidency alone now possesses 450 trained doctors and the Punjab about 200.

Two instructional courses were held, under the auspices of the association, at the leper hospital at Dichpalli in Hyderabad State which were attended by 9 final-year students of the Osmania medical college and 15 doctors of the state medical department. A special course of lectures on leprosy has been included in the curriculum of the course for the D.T.M., L.T.M., and D.P.H., diplomas at the school of Tropical Medicine.

Provincial Activities.—The work of the provision of actual treatment of lepers is undertaken by the 17 Provincial and State branches all of which were active during the year except Baluchistan whose work was dislocated by the Earthquake and has reported no activity. These

branches also undertake local propaganda and surveys, training of doctors through their special leprosy officers or others doctors who have received their training in Calcutta under the auspices of the Indian Council.

Madras.—The provincial leprosy relief committee met quarterly. The last meeting was presided over by the Hon'ble the Minister for Public Health and the other meetings by the Surgeon-General. There is a proposal to constitute and to call it a branch of the British Empire relief association (Indian Council). Leprosy clinics have been opened in all districts. There was a marked increase in the total number of leprosy clinics from 408 to 441.

The treatment given in the clinics consisted of subcutaneous and intramuscular injection of creosotted mixture of Hydrocarpus oil and its esters (obtained at the Government Medical Stores As. 8 and Re. 1 per pound respectively) and the external application of Trichloroacetic acid solution. Cases complicated with syphilis are treated with weekly injections of *Evenyle* in oil and esters (also obtained from the Government Medical Stores at As. 8 and Rs. 8-5-0 a pound respectively.) Reactions, which are rare, are given rest and injections of *Potassium Antimony tartias* or *Mercurchrome*. Experiments conducted in Royapuram leprosy clinic (Madras) have shown that cutaneous cases improve rapidly with intravenous injections of *Flourescin* while intramuscular injections flare up disease. *Brilliant green*, *Trypan blue* and *Methylene blue* were tried with very little success. Record syringes with or

without bayonet catches and with finger bars and crutches are generally used as they cause no pain to the inoculators. Cutaneous cases respond to treatment sooner but permanent results are obtained with neural cases. Much difficulty is experienced with perforating ulcers which take a long time to heal. The prolonged and painful treatment prevents many patients from receiving the full benefits of treatment. The twelve leper asylums were working as usual. This year a lady doctor was added to the staff of the leper asylums at Manamadurai, Ramnad district.

At the end of the year Dr. R. G. Cochrane took charge of the Lady Willingdon Leper Settlement. The total accommodation in the twelve Leper Asylums is about 2,100, one-third of which was provided in the Lady Willingdon Leper Settlement, which admits only treatable infectious cases and not advanced incurable ones, the asylums are too full and several hundred cases are on the waiting lists. The Government extended the Group Leprosy Scheme for another two years for the third time. The Leprosy Officers did more concentrated work in their headquarters districts. The Government appointed a Special Leprosy Officer for Salem district. The services of the district Leprosy officers appointed by the Malabar and West Godavary District Boards were continued during the year. The services of the special officer appointed by the Salem District Board to work at Peddanayakapalayam in Belur and by the Ganjam District Board to work at Belligunta also continued during the year. The duties of the Group

Leprosy Officers were to train the medical officers in the up-to-date methods of diagnosis, classification and treatment and in the maintenance of records.

During the year 300 schools were inspected; 58,000 school children were examined and 514 clinically positive cases were detected in the Corporation schools in the City of Madras. All school children having signs of leprosy were asked to go to the nearest clinic for treatment or observation but they could not be compelled to be so in the absence of specific statutory provisions to that effect. It has been however proposed to take up a small area for this work and to concentrate attention on school-going children. The question of forming a Leprosy Board for the Madras city to devise measures for the control of leprosy among school children in the city is being considered. As the success of leprosy campaign depends upon the saving of children and as it is observed that a large number of school children show signs of the disease it has been suggested that their observation for a period of not less than three years to ensure safety from the disease and treatment, if necessary, desirable. Only one Local Fund Sub-assistant Surgeon was sent to Calcutta in 1935, for training in the treatment of leprosy. The total number of medical officers to whom training has been given now is 450. Some of these medical officers were trained in their own stations while some others were attached to labour institutions and were deputed to undergo training at central places.

This was done chiefly in villages around clinics where attendance was

falling. Propaganda work with leaflets and by magic lantern lectures were also done. Propaganda by cinema has a very high educational value. It would be desirable to have a van, a projector and a very educative film to be taken round the presidency.

The cases which have been entered by the medical officers in the Registration Books are sorted out village-wise by the leprosy officer and are entered in their own registers. At present this work is confined to villages in an area of five miles radius. This work will facilitate the maintenance of leprosy registers by the headman of villages who will persuade the affected persons to resort to treatment. The Government have passed orders regarding the maintenance of leprosy registers by village headman. The village-war register is an invaluable aid to survey and follow-up work. Very frequently it has been noticed that the number of registered cases is far greater than the number detected by the Health Department during their survey and that at least 75 per cent. of the actual number of cases had attended the clinics. The Group Leprosy Officers with the help of these forms verify the existence of cases and examine their contacts, especially children, and give the necessary advice. The Saidapet Leprosy Association which completed a survey of Saidapet, where 450 cases of leprosy were detected, is now doing concentrated public health work in a small area with the help of the Red Cross Society which has lent the services of a health visitor and midwife.

District Leprosy Relief Councils to concert anti-leprosy measures,

to see to the financing of them and to give advice, have been formed in 17 districts, but only in a few districts were the councils active. The Salem District Leprosy Council keeps a careful watch over the activities in its district. The District Board has been regularly paying Rs. 6,000 annually towards leprosy work in addition to maintaining a special leprosy clinic at a cost of Rs. 4,000 a year. The question of constructing a children's home for children who show signs of leprosy and for those who are exposing themselves to infection, is receiving their serious attention. Three leprosy units with public health measures are being established in the district. The lines along which these units can be worked have been drawn up by the Chief Leprosy Officer and forwarded to the District Medical Officer. Leprosy

survey has been completed in two of these three units.

One of the greatest difficulties this presidency has been experiencing is the want of suitable leprosy sheds to carry on the treatment. Medical officers have been constrained to use the verandahs of their institutions for this purpose. The difficulty will, to a great extent, be solved in future, as about one and a half lakhs of rupees will be allotted from the Silver Jubilee Fund for Leprosy Relief Work in the Districts and a good amount of this will be used for erecting permanent leprosy sheds. It has been pointed out that a few Preventive Leprosy units, each one to be worked by a leprosy officer, are necessary with a view to obtain data for epidermiological research as well as to deal with prevention.

Service Notes and News.

We offer our felicitations to our beloved and popular president, Rao Bahadur Dr. A. Lakshmanaswamy Mudaliar, B.A., M.D., F.C.O.G., on his appointment as Vice-Chancellor of the University of Madras during the temporary vacancy caused by the leave for three months granted to the permanent incumbent. This, we know is only a prelude to future preferments and distinctions yet to be showered on him. That he is most eminently fitted to guide the destinies of the university, no one need doubt. Even from the inception of the new University Act, Dr. Mudaliar made himself familiar with its various aspects and intricacies and toured about enlightening the public by giving lectures at various places. Since his first election to the university bodies, chiefly the syndicate, he has made himself invaluable to such an extent that without him, the syndicate will be, to use a much hackneyed expression—'Hamlet' without that hero himself! And no wonder that his election to fill the office of the Vice-Chancellor by the members of the Syndicate was unanimous. When the time comes when he feels free to stand for election to the permanent appointment, perhaps in a few years' time, we venture to prophesy that his election by the senate also will be unanimous.

We notice that Dr. H. S. Hensman, M.R.C.S., L.R.C.P., M.P.C., has been appointed to be Honorary Assistant Surgeon to His Excellency

the Viceroy. A year ago his long and meritorious service was recognised by the conferment of the O.B.E. And now on the eve of his retirement comes this additional honour. We heartily congratulate him.

The Birthday Honours list just published contains the names of two members of our service. Rao Bahadur Dr. S. Ramakrishnan, L.M. & S., L.R.C.P. & S., L.R.F.P.S.G., D.T.M., has worthily filled the arduous task of the Joint Secretary of our association during the very difficult years of retrenchment and its aftermath. We owe a debt of gratitude to him for this. Apart from this he has to his credit honest and efficient duty performed wherever it has been his lot to serve, at the King Institute, in organising the Venereal Clinic at the Madras General Hospital and as Professor of Bacteriology at the Madras Medical College. In addition he has shouldered on himself the onerous though thankless job of assisting the principal in the administration of the College—and how efficiently this is being done we, who are his colleagues know. His work as joint secretary of the Centenary Committee of the College also deserves special mention. We offer him our heartfelt congratulations.

Dr. S. Rajagopal Naidu, B.A., M.B.B.S., M.Sc., (LON.), F.I.C., has

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whenever called upon to do so, filled the most responsible appointment of Chemical Examiner to the Government of Madras with remarkable efficiency. No other officer occupying similar appointments in this country possesses superior qualifications to Dr. Naidu. From next year onwards, it is our hope that he will fill this appointment and that of Professor of Chemistry at the college in a permanent capacity. The honour of membership of the Order of the British Empire which has now been conferred upon him is richly deserved by him and we heartily congratulate him on this distinction.

We shall be failing in our duty if we do not also offer our humble respects and our felicitations to our former Surgeon-General, Major-General Sprawson, I.M.S., on the knighthood conferred on him. We wish him a long life of further usefulness to this country in the higher role which he has been called upon to fill.

Rao Bahadur Dr. T. S. Tirumurthi, B.A., M.B.C.M., D.T.M., who has acted as Professor of Pathology at Vizagapatam and several times as Principal of the College there has now been transferred to the chair of Pathology at the Madras Medical College. We are glad to welcome him back to Madras. To him has been given the role of opening various appointments for our service—to blaze the trail, so to say, of our Service. For he was the first member of the Provincial Medical Service to be appointed

Professor at the Madras Medical College. We think it was in 1917-18 that he was appointed to act as Professor of Pathology. And well do we remember, standing around the big tree near the library along with other senior students and vehemently cheering him as he went to take his first class. He also gains priority of place in having been called upon to act as vice-chancellor of one of our universities, for more than once (we believe on four occasions), he filled the illustrious office of Vice Chancellor of the Andhra University. Last year he delivered the address at the convocation of the Andhra University. We are proud to count him as one of our members.

We offer our congratulations to Dr. P. Ramachandra Rao, M.B.B.S., Ph.D., who has been appointed to act as Professor of Pathology at Vizagapatam. He richly deserves this promotion. His is an extremely quiet nature with which he combines a gift for dogged and hard work. All the same he is very sociable and a keen sportsman. He is one of the few research workers in India who have done real work in the difficult line of experimental pathology.

It has been said of several great men of the world that the word 'Impossible' did not occur in their dictionaries. But there exists in the ranks of the provincial medical service a very quiet and unobtrusive individual in whose knowledge of the King's English the word referred to above does not seem to occur! We

refer to Dr. N. S. Narasimham, I.M.P., L.C.P. & S., L.R.C.P. (Lond.), F.R.C.S. (Ire.), F.R.C.S. (Eng.). The letters we have placed after his name show the extent of his perseverance and pluck. Starting life as a sub-assistant surgeon, and getting an additional qualification from Bombay, he made a name for himself even in the humble sphere of a sub-assistant surgeon as having the makings of a good surgeon. Then he went to Europe on study leave and not only passed the qualifying examination of the Royal Colleges but crossed over to get the Fellowship of the Royal College of Surgeons in Ireland. When the Royal College of Surgeons of England offered the opportunity to our young people of passing the primary examination in this country itself he was one of the first to take advantage of this concession and having passed this had the pluck, against various difficulties, to again proceed overseas and pass the F.R.C.S. (Eng.). He has now returned to take up his appointment at the Medical College. We cannot but feel that here is the type of man who deserves all the encouragement the authorities can give and who will always use his opportunities to the fullest extent. We admire his assiduity and his pluck and we offer him our heartfelt congratulations on the success that has come to him because of his hardwork, and which he so richly deserves.

In the earlier part of this year one of our esteemed colleagues, Dr. Sanjeeva Pai, M.B.C.M., who was acting as D.M.O. of North Arcot retired on attainment of the age of 55. We wish him all happiness in

his retirement and a long and peaceful life to enjoy his pension.

Dr. Miss D. Satur, B.A., M.B.B.S., F.R.C.S. (E.) M.M., S.A. (Lond.) Lady Assistant Surgeon has been appointed to the Women's Medical Service of India and therefore has left our service. We are sorry that such an eminently qualified person should be lost to us. But we wish her all success in her new sphere of life.

We welcome the following ladies and gentlemen who have in recent months been appointed to the service. We trust that they will lose no time in enrolling themselves as members of the association for in the difficult times we are passing through it is imperative for us to realise that 'Union is strength':—

Dr. Miss M. T. Cherian, M.B.B.S.
 „ Subbulakshmi, M.B.B.S.
 „ Chinnammu, M.B.B.S.
 „ Sosa Oommen, M.B.B.S.
 Dr. M. A. Parthasarathy,
 L.R.C.P., M.R.C.S. (Eng.),
 F.R.C.S.I.
 „ Achaya Naidu, F.R.C.S.I.,
 L.M.S.S.A. (Lond.), L.M.
 (Dub.), L.O. (Mad.)

Two recent appointments made in the Madras General Hospital give us room for much concern—that of Dr. D. Hari Rao, M.B., F.R.C.S., as Lecturer in Ear, Nose and Throat Diseases and Surgeon in that department and that of Dr. V. C. Govinda Menon, M.R.C.P.E., as Physician and Lecturer in

Therapeutics, both in the grade of assistant surgeons. We still hope against hope that the Government will listen to the strong plea we have put up against such retrench-

ments and will restore these appointments as permanent civil surgeoncies in the Provincial Medical Service.

An At Home.

On the 18th July 1936 the resident members of the Executive Committee (other than Dr. A. Lakshmanaswami Mudaliar and S. Ramakrishnan) were AT HOME to all resident members to meet Dr. A. Lakshmanaswami Mudaliar, Ag. Vice-Chancellor, University of Madras, Rao Bahadur Dr. S. Ramakrishnan, Dr. H. S. Hensman V. H. A. S., O.B.E., Dr. S. Rajagopala Naidu, M.B.E. and Dr. N. S. Narasimha Aiyar, F.R.C.S. (Eng.).

The gathering was a record one. 70 members responded to the invitation. It might be, the strength of the gathering was a tribute to the popularity of the chief guests. It gave a fillip too to those who were getting depressed by the apparent lack of enthusiasm of mem-

bers in the welfare of the Association. For never before in the annals of the Association except at the General Body meeting in 1931 which discussed the questions arising out of retrenchment, had the Association the privilege of getting together such a large number of its members.

After conversazione and tea, Dr. Venkatagiri, the Vice-President, congratulated the distinguished guests on the honours and academic distinctions they had earned. Suitable replies were made by each. In winding up the day's proceedings Dr. Venkatagiri appealed to all the members to pay up their current subscriptions (the arrears having been written off). This appeal is now extended to the mofussil members.

Book Reviews.

A Treatise on Materia Medica and Therapeutics, 14th Edition by B. N. Ghosh, pp. 724. (Calcutta: Hilton & Co., 1936 Rs. 7/8). This popular text book has gone through 14 editions and this alone testifies that the effort of the author has been well appreciated by the Medical Public in India. This is probably one of those rare text books on a scientific subject published in India which are being made use of by Medical students even in far off Scotland. In the edition under review the general arrangement of the book has been modified in order to follow modern methods in teaching the subject. Certain new synthetic remedies which have found wide application are considered. More attention is paid to the discussion of physiological action than in other text books of the same size and this is enriched by many diagrams. Therapeutic notes provide for its usefulness to senior students and practitioners and add to the interest of the subject as studied by the beginner. *Materia Medica* and prescription writing and a general consideration of pharmacy, knowledge of which is essential to a physician and which are sadly neglected in some of the standard text books on pharmacology are discussed and very useful hints are given to the student of pharmacy on dispensing. The get up of the book is pleasing and its size convenient. The price is within the reach of all. And we have no hesitation in recommending this book to all the medical students of this country, of

whatever grade they are. We also feel that the general practitioner will be well advised to keep a copy within reach for easy reference.

J. C. D.

A Hand book of Tropical Therapeutics by R. N. Chopra, pp. 1748 (The Art Press, Calcutta, 1936. Rs. 25) Colonel Chopra has been engaged in bringing out this very useful volume for several years now, and having had the privilege of going through the earlier drafts of some of the chapters I can very well realise the amount of hard work through a decade of years which this book has entailed. And one must admit that there is no better man in India capable of writing such a book. The book consists of 6 parts, as well as a dictionary of diseases and treatment, and appendices. Part I deals with general considerations in therapeutics and includes chapters on the action of drugs and conditions modifying drug action, modes of administration, chemotherapy, physiotherapy, diet and dietetics in the tropics, (sadly neglected in India), pyrexia, treatment of pain and insomnia and the use of tonics. In part II, treatment of helminthic diseases is considered, largely extracted from another book of the author. Part III deals with remedies used against protozoal diseases, viz., Amoebiasis, Leishmaniasis, Trypanosomiasis, Malaria and Spirochaetoses. From the point of view of tropical diseases this is the

most important portion of the book and much information has been gathered together regarding the pharmacological action, toxicology and the relative value of the remedies mentioned. In Part IV bacterial and virus diseases of special interest to the tropics are mentioned and discussed and the chapters specially on Leprosy, and Diarrhoeal diseases are well worth studying. Part V deal with other tropical diseases and the author has given us an excellent treatise on Beri-beri and Epidemic dropsy, diseases which are unfortunately so prevalent in Bengal and other parts of the country. Part VI deals with skin diseases of the tropics, a study very much neglected but resurrected with his characteristic enthusiasm by the late Col. Acton. Other special features are chapters on

snakes and snake venom, drug addiction, food values, where Indian diets and vegetables are specially considered. In short, the book is a veritable mine of very useful information and must be in the hands of every intelligent practitioner of medicine in this country. We would suggest that the title "A Hand Book of Therapeutics in the Tropics" may be a more apt title, considering the wide scope of its contents. The bibliography given at the end of each chapter will be found invaluable to other workers in the field. Unfortunately the volume is not in a convenient size to handle and we hope this will be remedied in the next edition which, we are sure, is bound to follow very soon.

J. C. D.

Notice to Contributors.

The next issue will be published about the 20th of October 1936. Contributions for publication may be sent to the editor before the 1st of October. Government servants are required to submit professional articles, original observations, etc., to the Surgeon-General for approval and so the papers may be sent through the Personal Assistant to the Surgeon-General or direct to the editor after approval. The address of the editor is "NIKKO", Theagarayanagar P. O., Madras.

NOTICE.

MADRAS MEDICAL COUNCIL.

The Registrar, Madras Medical Council, in his letter No. 2/36, dated 1st May 1936, desires us to publish the following notification:

"The Madras Medical Council at its meeting held on the 3rd March 1936 resolved that the following notice be published in all possible Medical Journals:—

"It is a grave breach of professional propriety for a medical practitioner to take any part in the manufacture, or sale, of a proprietary food or medicine or to have his name in any way associated with it. Medical men should also be cautious how they lend themselves to the puffing of these articles.

(Extract from the Code of Medical Ethics—Section 22)".

WANTED—FAITH HEALING!

I deeply regret to report the untimely death of Dr. X at C. While he was attending an operation case, he had a cut in his finger and was suffering from *sceptic poisoning*. He was admitted in the District Headquarters Government Hospital. Yesterday he expired in the hospital.

—"HINDU".

WONDERS NEVER CEASE!!

The following is from the advertising pages of one of our contemporaries:—

INFALLIBLE HERB-CURE

RENOWNED REMEDIES.

BIRTH CONTROL POSSIBLE!

BIRTH CONTROL POSSIBLE!!

How Birth Control at a nominal cost and without least detriment to the health of the Fair-Sex be possible has become the question of the day. Eastern wonders after so much of research have discovered a rare herb which, *if only kept in contact with the body by a lady* shall prevent conception. Success sure. One amulet will run a whole life.

Nissue—(Birth Control).

OBITUARY.

We have just learnt with great sorrow of the passing away on Saturday the 1st August of Mrs. R. K. Chettur, wife of Dr. R. K. Chettur, R. M. O. of the Government Royapuram Hospital and eldest daughter of Rao Bahadur Dr. K. Koman Nayar, Assistant Superintendent of the Government Ophthalmic Hospital. The couple were married only in May of last year and their married life has been all too short. We, on behalf of all our members offer our heartfelt condolences to our bereaved colleagues.

OBITUARY.

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No. 4

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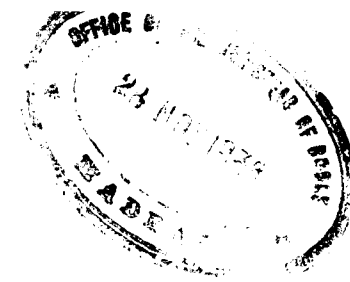
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The

Madras Medical Journal

The Journal of the Madras Medical Association.

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Some Observations on the Surgery
of Peptic Ulcers

By

N. S. NARASIMHAM, F.R.C.S., (ENG) & (I), L.R.C.P. (LOND).

I am just drawing the attention of the readers to some views on the surgery of this subject. The subject had been continually studied since 1920; I am indicating the changes in views since 1927 when I studied in Guy's Hospital, London, and 1935 and 1936 when again I saw much gastric surgery in Guy's, Barts and other hospitals in London and in Vienna. Many competent observers agree that duodenal ulcer is more common in South India than in many other parts of India. A distinguished surgeon who had considerable experience of gastric surgery in South India comments on its great rarity in Bengal. Competent post graduate students from other parts of India as Punjab, U.P., Bengal, Bombay give a similar account.

One learns from post-graduates from other parts of the world as Canada, the States, West Indies, Australia, South Africa, South America, Egypt that the disease is commonly met with in all nationalities. Such is the experience in European countries.

One should search for etiological factors that which may contribute to the common incidence of the disease in South India.

Clinical observations and experiments have convinced physicians and surgeons that gastric and duodenal ulcers should not be considered as isolated local lesions but they should be viewed as the outstanding and most painful symptom of metabolic disturbances which affect

the patient both psychically and mentally. This may be compared with the surgical complications of diabetes. The surgeon realises that excision of the ulcer or the performance of a gastric resection even are not enough without treatment of the patient's constitution.

There had been a change in the views held as regards etiological factors. Beaumont in 1833 had demonstrated on his patient with gastric fistula two distinct kinds of inflammation of the wall of the stomach, one following over-indulgence in alcohol and the other a febrile attack; but these excellent clinical observations were forgotten; Biochemical testing of gastric contents was introduced by Ewald and Boas in 1855. Since then a purely empirical classification of gastric disease was taught, based upon the varying acidity and motility of the stomach. The genius of the late Lord Moynihan discovered in one group of such cases—those with hyperchlorhydria and a tendency to pain when the stomach was empty—an underlying cause in the frequent occurrence of duodenal ulcer.

Since 1900 hyperchlorhydria, hyperchlorhydria and achylia gastrica had been recognised as diseases while chronic gastritis has been regarded as an undiagnosable rarity.

While Knud Faber since 1898 by his studies on the formalin fixed stomach by injecting 4% formalin solution into the abdomen immediately after death has never wavered in his belief that chronic gastritis is an extremely common and important disease, since 1925 A. F. Hurst of Guy's Hospital is teaching

that chronic gastritis is the only common primary disease of the stomach and that the prevention of gastritis would mean the prevention of chronic gastric and duodenal ulcer and cancer of the stomach.

It is fair to state that the opposite school believes that chronic gastritis is not primary but secondary to ulceration. Faber holds that gastritis is closely related to anacidity; its importance is recognised in the known relationship to pernicious anaemia and gastric carcinoma. This relationship will be alluded to again. The causes of gastritis may be grouped as follows;

(a) Mechanical, chemical and thermal irritants as strong tea and coffee, mustared pepper, curry, pickles and excess of totally indigestible raw vegetable matter and the unconscious swallowing of the juice of tobacco smoked in excess especially when the stomach is empty or when chewed; drugs taken for constipation, and drugs taken for chronic maladies as bromides, iodides, salicylates, mercury, digitulis and quinine, and alcoholic excesses

Chronic gastritis is a common sequel of the acute gastritis produced by a more violent irritant acting on single occasion. Beaumont in his observations on the gastric fistula found that the mucous membrane recovered quickly from the acute gastritis associated with achylia following his bouts of excessive drinking. No such recovery takes place in individuals with constitutional hyperchlorhydria and hypochlorhydria. It is undeniable in view of the South Indian experience in the incidence of the disease

that certain food factors play an important role in the etiology of ulcers. In my analysis of over 1000 cases of peptic ulcer, the disease is universal in all the parts of the province. It is interesting to note that an unusually high number of Abyssinians are suffering with peptic ulcers and they all consume large amounts of cayenne pepper.

Prophylactic measures in this province though difficult, are obvious.

(b) Chronic infective factors.

Infected material is constantly swallowed by people with pyorrhoea alveolaris, infected tonsils, chronic pharyngitis and sinitis and by children with adenoids.

These factors must be eradicated in every sound scheme of treatment by medical or surgical methods. The importance of these factors, though theoretically understood, are not practised at present in this country. In the well organised clinics this is done as a preliminary routine.

(c) Many acute infections are accompanied by acute gastritis, which is often followed by chronic gastritis.

I had observed that the patients with cirrhosis of liver are bad subjects for gastro duodenal surgery and that these patients had a higher mortality than the other types of cases who might be even lesser risks as judged by haemoglobin percentages, blood pressure and cell counts. These patients may be quite young as 25 or 30; recently a young man of 25 with advanced cirrhotic changes in liver died after a gastro-jejunostomy while a patient of 45 with marked ataxia and cirrhosis of liver got over a technically difficult gastro-jejunostomy. Post-mortem examinations on the cases showed focal necrosis of liver in these cases in our hospital.

It was not possible before an operative procedure to estimate the liver condition; a series of liver function tests on a dozen cases in 1929 did not give any indication. It may be confidently stated that these patients will stand only a minimum of operative procedures. I was not able to gather any useful information on these groups of cases, from the European hospitals although very early Moynihan recognised and taught that the duodenal ulcer is not an isolated lesion but one of a superior abdominal syndrome.

One other observation which has been forcibly impressed on me is that there is a certain type of cases who are toxic in that they have severe constipation, with a bad tongue and severe epigastric pain and of a highly nervous type. It is important to recognise this type of young individual who may eagerly demand an operation. They ought to be treated by medical measures unless they are absolute indications for operation. There is a higher mortality rate in this group. There is no corroborative evidence to prove that the detoxicating function of liver is diminished or absent in these cases.

Improved methods of diagnosis:—

The flexible gastroscope is used in France a great deal and is now in use in England. Gastroscopy is an

old subject but the introduction of flexible gastroscope dates from 1932 and has certainly facilitated this method of examination. There is no danger of oesophageal perforation now. During these last 4 years the Wolf-Schindler gastroscope has greatly increased the popularity of gastroscopy. But the normal variations in the size and shape of the stomach or in the colour and contour of its mucosa are far greater, and the interpretation of what is seen is more difficult. Efficient radiology can detect medium and large gastric ulcers and the majority of carcinomata when they come for treatment.

I worked in 2 hospitals where gastroscopy was widely practised. It is difficult to interpret but its chief value would lie in the detection of operable cases of gastric carcinoma and in watching the progress of the gastric ulcers under medical treatment.

Medical treatment—To those who practise surgery in the Madras Hospitals, medical treatment would appear to be out of place. The class of poor people who resort to surgical aid from all the parts of the province are impatient of even investigations and demand operations.

These poor people should be given the benefit of operative treatment as Raven in his "Survey of the results in the treatment of gastric and duodenal ulceration" in the St. Bartholomew Hospital Reports 1934 reports that in patients with gastric ulcer undergoing "medical treatment" 5% perforated and in patients with duodenal ulcer 4.5% of patients perforated. Medical treatment is beneficial for the

economically better class of patients who will be in the early stages of disease in the hands of the large number of general practitioners.

It is well to realise what is meant by medical treatment. The most popular method of treatment is that of Mayo Clinic. It is generally accepted that the ulcer patients should be treated just as strictly and thoroughly as tuberculous or diabetic patients.

Their hospitalization or treatment under similar condition is essential. They should be compelled to follow a rigid regime and be in bed and be deprived of tobacco, coffee or alcohol.

They are put to bed and are given sedatives as Luminal: The usual Sippey diet is given. The majority of the Indian patients will not remain on this diet and it requires great persuasion even with the better class of patients to get them to stick to this or a similar diet with modifications.

The drugs commonly used are magnesium oxide and calcium carbonate.

In cases complicated with gastric retention due to pyloric spasm, Belladonna and mucin are useful.

Of late, injections of histidine hydrochloride in the form of *Larostidine* are being used by practitioners in this city. Only two hospitals in London used it; it is believed to be efficacious but I have seen a good few whose symptoms had recurred. It does not permit of any relaxation of the other rules of treatment.

The main principles of medical treatment must not be forgotten and must be rigidly adhered to. The medical treatment of active peptic ulcer should be based on the principle that the stomach is not left for more than 2 hours without treatment.

The patients must be carefully watched and in Guy's hospital, where all cases are seen by the physician a rigid scrutiny and regime are enforced; repeated examinations are done and surgeon's aid is always freely availed of depending on the economic and social condition of patient. This pre and post operative medical treatment have now become universal in all well-organized clinics with follow up departments since 1929.

Individual surgeons and group clinics have accumulated large amount of clinical experience based on valuable data.

Surgical treatment.—As experience accumulated individual surgeons have laid down indications and principles of operative procedures.

(1) All are agreed in advising immediate operation in perforation; operative results are good only when they are operated in 6 hours after perforation and mortality increases with every hour and after 12 hours it is rare to have successful results. In my experience only 2 cases have been seen in 6 years of just half an hour duration in our wards.

(2) Pyloric stenosis is an absolute indication.

(3) In the other types of cases everything depends on the economic

condition of patient. As has already been mentioned these is a unanimity of opinion among surgeons that these ulcers should not be treated by operative methods unless medical measures have failed. But one should bear in mind that there are obvious disadvantages.

(a) There has been a rise in the percentages of perforation and haematemesis.

(b) There has been a fall in the percentages of cases gastric carcinoma which reach the surgeon in the operable stages on account of the universal medical treatment for all cases of dyspepsia. This above fact would make one take all precautionary measures in establishing diagnosis before treatment. I know of a case whose the expert radiologist was not quite certain about the diagnosis—in fact improvement was reported upon in a gastric ulcer: while an operation decided on clinical grounds showed an inoperable carcinoma.

(c) Most physicians have set down a time-limit: if there is no improvement at all in 3 weeks medical treatment in bed, the case must be reviewed; a first recurrence can be treated by medical measures; other cases must be dealt with by surgical measures.

(d) As mentioned above diagnosis must have been established before treatment: if the diagnosis is not obvious the proper course would be an exploration, although exploration as such, has diminished a great deal at the present time.

The operative procedures may now be mentioned.

(a) For perforation the principle would be to open the abdomen and to get out of it as quickly as possible. Suturing the ulcer, attaching part of the omentum to it or merely plugging the perforation with a small piece of omentum is the best method. A gastro-enterostomy is not done.

Whether we should operate, after the 30 hours duration depends on the condition of the patient. In Madras we have been operating by suturing the perforation on these cases whatever the duration may be. I know of a simpler procedure years ago of making a small incision and draining the abdomen; that also was of no avail. There is a change of opinion that emaciated, dehydrated patients with impaired renal and hepatic functions may better be treated by conservative and supporting measures, such as continuous intravenous drip with hypertonic saline.

(b) *Haematemesis*.—In Madras conservatism was practised for this complication; the history of frequent haematemesis was taken as an indication for operation; the operative procedures themselves were conservative unless the ulcers were gastric when a partial gastrectomy was done. Following the practice of Finsterer of Vienna, Sir Gordon Taylor of Middlesex hospital advocates immediate operation in cases of haematemesis due to peptic ulceration after reviving the patient with blood transfusion by continuous drip method.

The opinion among English surgeons is towards conservatism and physicians, such as Hurst, Tidy and Bolton are against operation. In

the states it would appear that they are treated by medical measures.

The British Post—graduate surgery advocates conservative medical measures. They argue that mortality under surgical measures is definitely greater than with medical measures alone even if the operation is a technical success.

If an operation is performed can the bleeding be arrested with certainty? On account of the presence of blood, the exact source of haemorrhage is obscured by blood and difficult to identify, but when found, control of the bleeding may be difficult from its location, the surroundings often not allowing of sufficient ligature. Lloyd Davies and Nevin found from the post-mortem reports that in 70 to 80 per cent of fatal cases there was a definite bleeding vessel capable of ligation. Of course this is not evidence that the bleeding vessel could have been identified at operation.

In a number of cases there may be a steady ooze of blood from a wide area of gastric mucosa. Where the site of bleeding is more restricted the offending vessel can sometimes be identified and tied and the bleeding arrested. More often it lies deeply buried in the floor of a penetrating ulcer and is difficult of access; the affected region is sodden and friable from inflammatory oedema around the ulcer and attempts at ligature are not successful.

My own experience is that the serious cases of bleeding have proved fatal under conservative measures in the surgical wards. My experience in the second group of

cases *i.e.*, post-operative haematemesis after gastro-enterostomy have also been similar. Only on one occasion I summoned courage to re-open the abdomen, and inspect the anastomosis; probably due to the anaesthetic the source of haemorrhage, was not obvious; I finished by inserting a few stitches but the patient could not be revived from the effects of the bleeding. Several post-mortems showed bleeding from the original ulcer and that generally from the gastro duodenal artery. From this point of view alone radical treatment of the ulcer itself is indicated but one realises that there are technical difficulties especially in a difficult case.

With a knowledge of these facts it is well to know Finsterer's line of argument. Finsterer wrote in 1923 as follows and has consistently followed the same practice up to this day. "Operation for acute haemorrhages: In 4 large Viennese hospitals during the last 10 years, 190 fatalities from erosion haemorrhages from gastric or duodenal ulcer came to autopsy. This is certainly a great number if we consider that the deaths occurring in other hospitals as well as in Sanatoria and private homes are not included in this number. The mortality under medical treatment is not 2.5 per cent but at least 20 to 40 per cent. Compared with this the mortality following operations is not 30 to 50 per cent but much less." English Statistics also prove that mortality under medical treatment is 20 to 25 per cent and not 2 per cent as stated by Hurst and Conybeare.

Finsterer's procedure is as follows:—Under local anaesthetic he

explores the abdomen to ascertain whether or not the haemorrhage originates from an ulcer or not and to confirm whether or not the haemorrhage is due to a penetrating callous ulcer or not. The exploratory laparotomy under local anaesthesia is less dangerous to the patient than the expectant treatment with an uncertain diagnosis. The success of the operation depends upon the degree of the anaemia present and with it the duration of the haemorrhage. In this stage "Resection" is not too great an attack; up to 1923 he had done resection of the bleeding ulcer and a large part of the stomach 17 times in the early state (within 48 hours after the beginning of the haemorrhage). All cases recovered. This success has induced him to take a decided stand for early operation within 24 to 48 hours after the beginning of the haemorrhage. In this stage the anaemia is not so severe and the danger of perforation can be avoided where otherwise it might happen at any time in spite of the most energetic treatment.

If haemorrhage has been treated internally unsuccessfully and in spite of it does not cease, which almost always happens in erosion of a large vessel (gastric, pancreaticoduodenal artery), then the late operation should not be declined on account of the severe anaemia and the still worse prognosis, but the attempt to save the patient by operation should be made.

The best method in stopping the haemorrhage is the resection of a bleeding ulcer. In ulcer of the stomach resection is always possible. In ulcer of the lesser curvature

penetrating into the pancreas the resection becomes absolutely necessary since the gastro-enterostomy can probably stop the bleeding in a superficial ulcer. It is useless when we have to deal with a penetrating ulcer. The circumscribing by suture of coronary arteries according to Witzel at the utmost may be beneficial in a callous ulcer situated at the lesser curvature or an ulcer penetrating into the small omentum but not when a perforation occurred into the pancreas.

In duodenal ulcer Finsterer does a resection when possible. Only when the ulcer cannot be resected even in the absence of haemorrhage but on account of its anterior extension toward the papilla and choledochus. Finsterer is satisfied with ligature of the pylorus for complete exclusion of the ulcer, at least for 2 or 3 weeks and does a posterior gastro-enterostomy and places upon the duodenum a large gauze tampon coming through the anterior abdominal wall. By means of a compression bandage this tampon is pushed firmly against the duodenum through which the anterior abdominal wall is pressed against the posterior duodenal wall and consequently forced against the bleeding ulcer, exactly as if it were being pressed down continuously by the finger; in this manner we are certain to stop all bleeding. To avoid injury to the pancreas this compression must cease after 24 hours at least. Blood transfusion for the relief of acute anaemia in after treatment is useful in the highest degree of anaemia.

Very great caution must be exercised in the use of morphine before and after operation. Morphine is

dangerous in an exsanguinated patient if the ordinary dose is given. I have dealt with the subject of haemorrhage as I believe we have not bestowed sufficient attention to this subject here. It requires great courage but some lives can be saved.

(c) Operative procedures for the other case, I will just indicate the present tendencies.

(1) Most British surgeons perform partial gastrectomy of the Polya type in cases of gastric ulcer. Walton does a wedge resection and completes the operation with a posterior gastro-enterostomy, one can gain many small points by watching Walton do the wedge-resection. Most operators have not been happy with wedge resection and my own limited experience of this procedure before has not been happy.

(2) In duodenal ulcer, most British surgeons including Walton and the late Lord Mynihan do only a posterior gastro-enterostomy. In U. S. A. they always deal with the ulcer locally by excision or cautery and suture. Ogilvie of Guy's Hospital after working with Finsterer in Vienna has been practising resection of the stomach, under local anaesthetic. His paper and premises have been criticised. Ogilvie was led to practise the resection operation on the belief led by Hurst that "Gastro-Jejunostomy has become a disease" predisposing to Jejunal and gastro-jejunal ulcers.

The Association of Surgeons of Great Britain and Ireland after an elaborate enquiry from various British surgeons and follow up clinics have not been able to

advocate resection as a preventive of gastro-jejunal ulcer; I have seen a perforation seven weeks after gastro-duodenal resection. After watching Ogilvie and the other Guy's surgeons and Professor Finsterer, I am of opinion that Finsterer's method of gastrectomy is far better and safer, and avoids the complications which I used to observe in my cases and which others doubtless have had. Whether gastro duodenal resection should be practised as a routine or not is not difficult to answer. Its mortality rate here is 20 to 25 per cent with us and hence it should be practised only in cases with hard indurated, penetrating ulcers with tendency for repeated haemorrhages and with high acid curves.

The local anaesthetic with splanchnic block is admirable and that is my experience here also.

Finsterer still uses silk for most of his sutures. He closes the stomach in the upper portion instead of making the anastomosis the entire width of the transverse stomach incision. He attaches great importance to the kind of incision in the stomach. If the incision is made perpendicularly to the axis of the stomach (Polya) it is possible that the gastric stump which lies in the abdomen without fixation to duodenum, following line of gravity will turn so that the lesser curvature forms more or less continuation of the oesophagus, the result of which will be that the apparent loop of the jejunum will be in level with the descending loop so that being situated more in the direction of the peristalsis, its filling and the retrograde filling of the duodenum

can hardly be avoided. This retrograde filling is one of the drawbacks several times met with after Polya operation and has been encountered by many competent surgeons all over.

This retrograde filling can be avoided by (1) making the incision in the stomach oblique to the stomach axis and parallel to the body axis of the patient (2) by not utilising the entire cross incision of the stomach for the anastomosis, but the lower part only (3) by not taking the ascending loop too short that one can fasten it high enough for the closing of the stomach wall.

In the resection of the stomach for the exclusion of an ulcer of the duodenum that cannot be resected, it is particularly important to avoid this retrograde filling of the duodenum absolutely as hyperacidity may occur as a result of the retrograde filling of the excluded pars pylorica.

N. B. Finsterer does not crush the distal end of the duodenum; crushing produces necrosis on account of deficient blood supply, and leakage and fistula.

I have met with leakage from duodenal stump and temporary fistula. I have seen retrograde filling of the duodenum and perforation and I appreciate the importance of this technical point.

As the paper has become very lengthy I am not referring to the many important subjects of (1) Hypertrophic stenosis of pylorus of infants (2) the surgery of gastro-jejunal ulcer (3) the hour-glass stomach.

A few points regarding the subject of carcinoma of stomach are essential. Cases reach the surgeon when the radiologist demonstrates the presence of cancer: 50 per cent are obviously inoperable and of the other 50 per cent where laparotomy appears to be justified, it is found impossible in half the instances to resect the growth.

The early diagnosis of carcinoma of the stomach becomes the all-important factor. Radiographic examination with a barium meal by an expert is the only means of diagnosis. This method of examination must not be omitted in any case of dyspepsia in a patient over 40. Gastroscoy is not helpful. It is difficult to decide even by a direct examination whether an ulcer is simple or malignant. Radiogram would demonstrate (a) presence of ulcer (b) increase in size in spite of efficient medical treatment (c) filling defect (d) irregularity at the edge of the ulcer crater (e) Carcinoma of the stomach which begins in the sub-mucosa, and tends to spread laterally in this layer before either coming to the surface or fungating into the lumen of the stomach or involving the peritoneal surface. The infiltration causes local rigidity of the gastric wall and it is this sign and the associated interruption of peristalsis at the site which must be hunted for most carefully in the radiological examination. Small areas on the lesser curvature, may be found, but on the greater curvature, where there is more normal mobility, or at the cardiac end, which is often difficult to fill with opaque material, or at the pyloric antrum, where a certain

amount of rigidity is normal, there is much difficulty.

The next stage which occurs in the majority of cases, is the heaping up of the mucous membrane, and this produces finger print impressions in the lumen of the stomach with displacement of the opaque material at the site of rigidity. At this stage the lymphatics and glands on the curvatures are becoming involved also and extirpation by resection may be impossible. The mucosal pattern, which may be outlined by a small quantity of opaque material during the early filling or emptying stage of the barium meal, gives much less aid in diagnosis than it does in the case of gastric ulcer, polyposis, or gastritis. The heaped up mucous membrane in the two latter conditions may give the appearance of a filling defect in a single picture, but the stomach is capable of filling and emptying—that is the rigidity associated with carcinoma is lacking.

The significance of the symptom "Loss of appetite" must be fully realised. Loss of appetite is associated with achlorhydria. Achlorhydria is due to chronic gastritis, not to carcinoma, which itself is secondary to chronic gastritis. On the other hand, carcinoma may develop in a chronic gastric ulcer before there is generalised gastritis, producing loss of appetite this symptom is therefore unreliable. Gastric haemorrhage is less common; occult blood in stools or in resting juice is more valuable. The presence of a palpable tumour may be clinically late but may be pathologically early. If there are no secondaries a partial gastrectomy is indicated.

There has been a serious study regarding the significance of achlorhydria in carcinoma of the stomach. Achlorhydria or an extreme degree of hypochlorhydria is present in about 70 per cent of patients with carcinoma of the stomach. It was formerly believed that achlorhydria was a result of carcinoma of the stomach but since 1929 Hurst has shown evidence and taught that achlorhydria is really caused by chronic gastritis, which is present before the growth develops, the growth being the result of malignant degeneration of the chronically inflamed mucous membrane.

On the other hand the hyperchlorhydria remained unaltered in 3 patients with chronic ulcers which subsequently underwent malignant degeneration. In a case of ulcer-cancer the acidity may actually rise whilst the carcinoma was growing, presumably owing to the favourable effect on the associated gastritis of the diet and lavage, which will keep the patient free from pain. In almost every undoubted case of ulcer cancer in which a test-meal has been given free acid was found in spite of the fact that the history was often very long, whereas when the evidence pointed against the growth being secondary to a simple ulcer achlorhydria was generally present even if the test-meal was given at an early stage of the disease.

The chance of long survival after a successful gastrectomy is greater in patients with achlorhydria than in those with free acid.

As carcinoma follows chronic achlorhydric gastritis, which may also cause microcytic anaemia, pernicious anaemia and sub-acute combined degeneration of the cord, these conditions occur with or precede the development of a growth.

The relationship of the above conditions may lead to the early diagnosis of certain cases. It should be possible to prevent the development of cancer of the stomach by preventing the development of chronic gastric ulcer and chronic achlorhydric gastritis in those predisposed by their gastric constitution, or, when this fails recognising and curing them at as early a stage as possible and taking prophylactic measures to prevent their recurrence. Prophylaxis consists in removing the various exciting causes of gastritis.

In inoperable cases, the short circuiting operation is commonly done, the average period of life in short circuit cases is 6 months. It relieved pyloric stenosis as such, it does nothing to relieve the chronic gastritis which is associated with carcinoma of the stomach and is the principal agent in producing the symptoms.

The average duration of life after a partial gastrectomy is 12 months to 1½ years and the operation mortality including cases that die in one month is 33·3 per cent. These facts are based on a study of a large number of cases from St. Thomas' hospital. The story is depressing but it must make us alive to the question of early diagnosis.

A note on an Epidemic of Diphtheria in Madras.

(Bacteriology Department, Medical College, Madras.)

There was recently a sudden sharp rise in the incidence of Diphtheria in the city, so definite indeed that a note of advice was issued to the Press by the City Health Officer. According to his figures 41 cases were reported during the months of July, August and September with 3 deaths. In the College laboratory we examined during the same period 98 throat swabs of which 26

were found positive for diphtheria both by smear and culture.

Such an unusually large number of positive findings could only be attributed to the prevalence of the disease in an epidemic from.

Table I below gives the classification of the 26 positive cases according to community, sex and age.

Table I.

	Hindus.		Anglo Indians and Europeans.		
	Male	Female	Male.	Female.	Total.
Below 7 years	5	5	—	1	11
Above 7 years	6	1	3	5	15
				Total	26

All these cases were treated as inpatients in the hospital. A white patch or membrane has been observed on the tonsils in the majority of the cases. Of these only 2 cases died in the hospital within a few hours after admission. The rest recovered with serum therapy. In none of these cases had there been any signs of post-diphtheritic sequelae like heart failure or

pharyngeal paresis except in one case.

Throat swabs were taken immediately on admission before serum was given. Cultures were put up on special media and direct smear examination was made at the same time.

Gram positive bacilli suggestive of *C. Diphtheria* were seen in all

the smears, and proved positive later by culture. In only 3 of these cases did the original smear reveal the typical metachromatic staining with the differential stain--Ponder's.

Smears from the cultures were examined the next morning. Special stains like Ponder's and Von Staltenberg's, stain was used as differential stain. All these positive cultures showed the typical metachromatic staining. The strain from all the positive cultures after being isolated in a pure condition, were subjected to biochemical and virulence tests. All of them fermented Glucose and Maltose with production of acid only.

Saline emulsion of the strain grown on a tube of inspissated serum slope was injected subcutaneously into a guineapig. Out of the 26 cases, 14 animals died within 24 hours, 11 within 48 hours and one only at the end of 5 days. The post-mortem examination of the guineapigs showed marked congestion and necrosis at the site of injection, and acute haemorrhagic congestion of the suprarenals, and in most of the cases, congestion of the lungs and spleen as well were noticed.

It is interesting to note from Table I that during this epidemic, there has been a great incidence among adults both Hindus and Anglo-Indian, who were affected, though Diphtheria is generally considered a disease of childhood.

A rapid diagnosis and early administration of diphtheria antitoxin in massive doses has lowered the mortality and also modified the course of this disease and one does

not often meet with the post diphtheritic sequelae, in well handled cases: When there is any suspicion of diphtheria, it is a safe policy to give serum straight away after taking a throat swab for bacteriological examination. The Physician never waits for the report in suspicious cases.

The amount of antitoxin to be given in a particular case depends more on the severity and the day of the disease when treatment was begun than on the age of the patient.

Early administration of serum in maximum doses is of paramount importance in this condition, as delay is fatal.

During this epidemic nearly 50,000 to 1,00,000 units of antitoxin have been administered within 48 hours of admission for most of the cases admitted in General Hospital. All the positive cases were discharged only after getting 3 consecutive negative cultural reports. In one case however there were 3 negative cultural report. But the patients' temperature rose to 102° F. on the day of taking the third swab with pain in the throat. Smear taken from the throat proved positive both in smear and culture. Administration of antitoxin serum brought down the temperature.

What measures can be adopted to prevent the spread of such epidemics? What are the prophylactic measures for the contacts?

Those who were near the patients should get on injection of diphtheria antitoxin (500 to 1000 units). This gives immediate protection.

though such protection lasts for only 3 to 4 weeks. To induce a more lasting immunity active immunisation should be carried out. Of the several preparations the following are commonly used:—

(1) Toxoid-antitoxin floccules (T. A. F.)

(2) Antitoxin-formalised Toxin (F. T.)

T. A. F. is a toxin antitoxin combination in a stable flocculent form suspended in saline. A course of 3 subcutaneous injections of 1 c. c. each (for adults) at intervals of 2 or 3 weeks are to be given. The injection is painless and there is little or no reaction. The immunity is said to be established in about 12

weeks and lasts for a very long time.

The other preparation F. T. is less costly. Even with this method 3 injections of 1 c. c. each at intervals of 2 to 3 weeks are to be given. The disadvantage is the injection causes severe reaction in adults, though children tolerate it better.

The throat swabs of all the nursing staff of the General Hospital were examined for diphtheria— all were negative. As material for Schick's test was not available, all the nurses were given Propylactic inoculation.

Our thanks are due to the Superintendent and medical officers of the General Hospital for kindly permitting us to publish this note.

A Study of the Mantoux Test in the Population of a Tuberculosis Hospital

BY

K. S. SANJIVI, M. D.

(Government Tuberculosis Institute, Madras).

The Von-Pirquet test has been employed for many years past in the Tuberculosis Institute, Madras (Kessava Pai and Venugopal, 1926¹). Since then the Mantoux intradermal test has practically superseded the cutaneous test in all western countries as "being the most accurate skin tuberculin test for diagnostic purposes".² While the error of a negative Von Pirquet reaction in excluding clinical tuberculosis has been estimated at about 15 to 23 per cent by different observers, a negative intracutaneous reaction to the standard (1 in 1,000) dilution of tuberculin must weigh heavily against a diagnosis of clinical tuberculosis, the average error being only 4 per cent (P. D'arcy Hart³).

In order to obtain a first hand knowledge of the Mantoux test we have applied the test to every new admission into the Government Tuberculosis Hospital from July 1934 to June 1935. A Von-Pirquet test has also been done simultaneously employing scarification with Padbury's lancet through a drop of old Tuberculin.

For the intracutaneous test, 0.1 c. c. of a 1/1000 dilution of old

tuberculin (0.1 mgm) was injected into the skin of the forearm. Reactions to both the tests were read daily for the next three days. All the tests were done and read by the writer to exclude the personal factor in interpretation. The readings were represented as follows:

— No erythema or induration.

+ Erythema or induration 5 mm. in diameter.

++ Erythema or induration 5 to 10 mm. in diameter.

+++ Erythema or induration more than 10 mm. in diameter.

The readings taken after 48 hours are used as the standard for purposes of comparison throughout this paper. Every case was X-rayed to confirm the diagnosis.

Table I shows the readings of the Von-Pirquet and Mantoux tests with the clinical diagnosis in 473 cases:

TABLE I.

Clinical Diagnosis.	No. of cases	V. P. —	M. —	V. P. +	M. +	V. P. ++	M. ++	V. P. +++	M. +++
P. T. III	298	52	42	86	37	95	108	65	111
P. T. II	6	...	...	3	4	3	2	...	...
P. T. I	30	1	2	11	8	11	8	7	12
Non-Pulmonary Tuberculosis	16	12	1	2	1	5	2	7	12
Non-tuberculous with childhood type	113	40	37	23	15	30	27	20	34
Non-tuberculous without childhood type	10	10	10	...	...	...	...	...	...

Table II shows the tuberculin reactions on admission in 334 cases of P. T. with the result of treatment in those cases.

TABLE II.

Results	V.P.—	M.—	V.P.+	M.+	V.P.++	M++	V.P.+++	M.+++
Much Improved.	4 13 out of 54 or 24%	4 10 out of 43 or 23.3%	37 69 out of 99 or 69.7%	19 32 out of 50 or 64%	56 86 out of 111 or 77.5%	57 91 out of 119 or 76.5%	36 60 out of 70 or 85.7%	53 95 out of 122 or 77.9%
Improved	9	6	32	13	30	34	24	42
Not Improved	38	31	27	15	22	26	9	24
Died	3	2	3	3	3	2	1	3
Total	54	43	99	50	111	119	70	122

DISCUSSION.

The presence of a positive tuberculin test is accepted by all authorities to indicate the existence of a tuberculous infection, past or present. The ten cases in our series that showed no radiological evidence of infection at any time had

all a negative tuberculin reaction. There is however considerable divergence of opinion regarding the other questions connected with the tuberculin test. The error of a negative Von-Pirquet and that of a negative Mantoux have been estimated at about 20 per cent and 4 per cent by D'arcy Hart.

In our series, taking all the 463 cases who showed X-ray evidence of infection, 20.5 per cent had a negative Von-Pirquet, and 17.7 per cent a Mantoux negative to the standard dilution employed. On excluding the 106 cases of advanced pulmonary tuberculosis who either showed no improvement or died, the negative reactors were 15.1 per cent (Von-Pirquet) and 13.7 per cent (Mantoux). If again the cases with no active signs of tuberculosis are also excluded, the negative reactors will be only 5.7 per cent (Von-Pirquet) and 4.9 per cent (Mantoux). In other words, these tests indicate clinically active and resistant types of tuberculosis with only an error of about 5 per cent. This observation would appear to confirm Krause's belief that "Cutaneous hypersensitiveness increases with progressive disease, and varies directly with the extent and intensity of the disease",³ and Myer's plea that "The tuberculin test which results in a positive reaction indicates that tubercle bacilli have gained entrance, found lodgment and are producing or have produced tubercles; and should be followed by immediate treatment."⁴

In the 113 non-active but infected cases, 35.4 per cent by Von-Pirquet and 32.7 per cent by Mantoux test showed a negative reaction. This might be due to the following two reasons:

(1) A positive reaction is more readily obtained when the infection is active than when it is healed.

(2) About half the negative reactors among these were cases of definite bronchiectasis. Is it possible that the presence of the secondary organisms in these cases depressed the allergy to tuberculin?

Table II gives an indication of the prognostic significance of the tuberculin tests, which is believed, by most authorities, to be slight. "Allergy and immunity are incomparable concepts, therefore, attempts to measure one of these two phenomena in terms of the other result in failure" (Karan and Danford⁵). In our series, however, a positive reaction has meant a good outlook and the more marked the reaction, the better the outlook.

I thank the Superintendent, Government Tuberculosis Hospital for permitting me to publish these results.

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The Proposed Addendum to the British Pharmacopoeia, 1932

(Summary of Proposals for inclusion in,)

BY

J. C. DAVID, M.B., PH.D.

After the publication of the 1914 edition of the British Pharmacopoeia, a considerable time elapsed before the next edition was thought of. When the 1932 edition was published a desire was expressed in responsible quarters that the national book of standards for drugs and formularies which the B. P. is, should be revised more often. With this view a permanent commission was set up to review comments and criticisms of the monographs of the B. P. which might come to the notice of this commission. This commission also set up committees to study and survey the action and usefulness of newer remedies which have found an increased use in practice, in order to incorporate those that have established a real reputation in therapeutics, in order that definitions and standards for them might find early inclusion in the pharmacopoeia. The commission after considering the reports of these committees came to the conclusion that the suggestions for the emendation of existing monographs and appendices and for the inclusion of new ones, were sufficiently numerous and important to justify them in recommending the General Medical Council to arrange for the publication in 1936, of an addendum to the Pharmacopoeia of 1932. The preparation for the draft of the forthcoming Addendum being now well advanced, the Council has authorized the commission to collect and to publish the reports of their committees, so that the principal recommendations, relating to emendations of the text of the B. P. 1932 and the most important data from the proposed descriptions of drugs and products now newly recommended for inclusion, may be made available for discussion by medical practitioners, pharmacists, and others who may be interested, before they have been finally adopted. We have this publication before us and as we in this country set our standards of our *materia medica* by the British Pharmacopoeia, publicity given to these recommendations seems very desirable. It has not been possible to include all the drugs which the committees would like to see included in the B. P., because of considerations arising from the law of patents and in other cases owing to difficulties of standardisation. The following is a list of the important additions:

The following drugs are recommended for description in the Addendum:

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Argentoproteinum:—(Synonyms—Argento-proteinum Forte; Strong Silver Protein). This is the official name for what is familiar to us as *Protargol*. While *Argyrol* has about 25 per cent of silver, *Protargol*, styled the strong proteinate of silver has only 7.5 to 8.5 per cent of silver. The nomenclature, strong or weak, depends upon the amount of free or ionisable silver present.

Acetarsol is acetyl amino-hydroxy-phenylarsonic acid, commonly known to us as *Stovarsol*, *spirocid* etc. It contains about 27 per cent of Arsenic. This is one of the insoluble pentavalent arsenicals and has been tried as a prophylactic in Syphilis and also in its treatment. In this country it has assumed greater importance in the treatment of chronic amoebic dysentery. It has also been used as the sodium salt for injection in cases of malaria.

Bismuthi et Sodii Tartras is obtained by the interaction of bismuth hydroxide and sodium acid tartrate. It contains not less than 35 per cent and not more than 42 per cent of Bi. It is a white powder or slightly yellow scales, soluble in less than 1 part of water and the solution is neutral to litmus. As no soluble forms of bismuth have been official so far, this is a welcome addition to the pharmacopoeia. Half grain doses act as efficient diuretic.

Bismuthi Oxychloridum is a basic salt of varying composition, obtained by the interaction of solutions of bismuth nitrate and sodium chloride or hydrochloric acid. It contains not less than 79 per cent and not more than 81 per cent of Bi, and

not less than 12.5 per cent of Cl. It is a white or nearly white amorphous or finely crystalline powder. This substance may be used for the local action on the alimentary canal or for producing the specific effects in syphilis. Harrison prefers this substance for intramuscular injection suspended in a watery medium.

Injectio Bismuthi Oxychloridi is recommended to be made in a similar way to *Injectio Bismuthi*. P. B.

Calcii Chloridum Hydratum:— $\text{CaCl}_2 \cdot 6\text{H}_2\text{O}$ has been introduced for injection purposes. The calcium chloride of the B. P. 1932 is the anhydrous variety.

Calcii Gluconas is the normal calcium salt of gluconic acid, and has already attained considerable popularity as the salt of choice for injection treatment whenever calcium is indicated. It is a white crystalline or granular powder slowly soluble in 30 parts of water and soluble in about 5 parts of boiling water.

Chiniofonum has been known to us as *Yatren*. This is a mixture of approximately four parts by weight of 7-iodo-8-hydroxyquinoline-5-sulphonic acid and one part by weight of sodium bicarbonate. It is a light yellow powder; odourless; taste bitter with a sweetish after-taste.

Ergometrine is an alkaloid obtained from *Ergot* and purified by crystallisation from a suitable organic solvent. This alkaloid has already been popularised and in such small doses as 1/120 grain when given by mouth produces a marked contraction of the uterus. The dis-

covery of this alkaloid by Dudley and Moir less than a year ago has put an end to the vexed question of the real active principle present in extract of ergot.

Extractum Stramonii Liquidum is almost identical with a similar preparation of the B. P. C. It is an alcoholic extract containing 0.25 per cent of the total alkaloids of stramonium, calculated as hyoscyamine. 3 minims will therefore contain about 1/150 grain of the alkaloids. The dose in the B. P. C. is $\frac{1}{2}$ to 3 m.

Extractum Stramonii Siccum.—A dry extract of stramonium is required for administration in tablet form. The extract has therefore been introduced with an alkaloidal strength of about 1 per cent. The B. P. C. has a similar preparation of which 1 grain contains 1/100 grain of alkaloids, with a dose of $\frac{1}{4}$ to 1 grain.

Ferri Chloridum Citratum.—This is ferrous chloride containing citric acid. The citric acid is probably added to prevent decomposition and formation of basic compounds. It is a buff coloured powder with an acid, metallic and astringent taste almost completely soluble in water. It contains not less than 68 per cent of ferrous iron, calculated as FeCl_2 , and not more than 5.9 per cent of ferric iron, calculated as FeCl_3 .

Histaminae Phosphas Acidus is the di-acid phosphate of 4-B amino ethylglyoxaline. Prepared from histamine obtained from natural sources or by synthesis. Colourless crystals, odourless and soluble in 4.5 parts of water. This

substance has assumed much importance in recent years, being used as a inducer of gastric secretion and more recently in the treatment of joint affections. It is present in ergot but is there of no therapeutic significance.

Liquor Ioti Aquosus is Lugol's solution and contains 5 per cent w/v of Iodine and 10 per cent of Potassium Iodide.

Oleum Iodisatum is the official brand of *Lipiodine*, and is an iodine addition product of poppy seed oil, and may be prepared by treating poppy seed oil with hydriodic acid. It contains not less than 39 per cent and not more than 41 per cent of combined iodine. It is a pale yellow viscous oily liquid, with a slightly alliaceous odour and a bland oily taste.

Mersalylum has been known to us for sometime as *Salyrgan*, the complex organic preparation of mercury which is a most powerful diuretic. Mersalyl is the sodium salt of salicyl-y hydroxy-mercuric-B-methoxypropyl amide O-acetic acid. It is a white powder; odourless; and with a bitter taste. It is deliquescent and soluble in 1 part of water and in about 3 parts of alcohol.

Solutions of Mersalyl containing sodium chloride or other salt may become toxic unless some substance, such as theophylline, which prevents the formation of ionised mercury, is present. For injection, *Injectio Mersalyli* should be used.

Injectio Mersalyli. For the above mentioned reasons, the

sub-committee has recommended the following formula for the injection:—

Mersalyl	...	10 Gm.
Theophylline	...	5 Gm.
Sodium Hydroxide	...	0.05 Gm. or q. s.
Sterilised water,	sufficient to	produce 100 mil.

Sodii Thiosulphas, the photographer's hypo has been much used in therapeutics as a parasiticide, and internally, orally as well as by injections as antidote to metallic poisons, pre eminently in the treatment of exfoliative dermatitis caused by organic arsenicals.

Theophyllina is a di-methylxanthine and is an alkaloid obtained from the dried leaves of the tea. It may also be prepared synthetically. Theophylline and sodium acetate is already in the pharmacopoeia.

Tryparsamidum is sodium N-phenylglycine-amide-p-arsenate and is a pentavalent organoarsenical containing about 25 per cent of arsenic. It has established a reputation in the treatment of neurosyphilis and trypanosomiasis as a builder of resistance and a penetrant of nervous tissues, and for its tonic action in these cases. It is not a powerful spirochaetocide but therapeutically it is a powerful remedy in cases of syphilis of the nervous system and in this it has no competitor at present. It is a colourless, crystalline powder; odourless and freely soluble in water. For injection solution must be made in cold sterile water and the solution *must not be boiled*.

Of *Vitamins*, the following preparations are proposed to be included:—

Acidum Ascorbicum or Vitamin C. This is obtained in pure form in minute crystals, odourless and with a taste resembling that of lemon juice. Chemically, it is the enolic form of 3-keto l-gulofuranolactone, and may be obtained from vegetable sources or synthetically. It contains in one gramme 20,000 units of antiscorbutic activity. Directions for chemical and biological assay of this and the other vitamin products included are also given.

Calciferol or Vitamin D may be prepared by the ultra-violet irradiation of ergosterol in a suitable solvent. The product of the irradiation, after removal of the solvent, is dissolved in alcohol 95 per cent, or other suitable organic solvent, and strongly cooled. The unchanged ergosterol which separates is removed by filtration, and the solvent is removed by evaporation under reduced pressure. After further elaborate chemical processes of purification the product, calciferol is recrystallised in a suitable solvent. It contains in 1 mg. 40,000 units of antirachitic activity. It is in the form of colourless acicular crystals, odourless, insoluble in water. It is soluble in vegetable oils.

Liquor Calciferolis is the proposed new name for a preparation similar to the *Liquor Ergosterolis Irradiati* which is being deleted. It is a solution of calciferol in oil. It contains in 1 gramme, 3000 units of antirachitic activity.

Pulvis Vitamin B₁ is an adsorbate of the antineuritic vitamin upon Fuller's earth. The material extracted from rice polishings is adsorbed upon Fuller's earth and adjusted to contain 100 units in 1 gramme. It is a cream coloured powder; almost odourless; tasteless and insoluble in water and in mineral acids.

In addition to those already in the pharmacopoeia, the following *antitoxins* and *sera* are to be included:—

Antitoxinum Oedematiens is gas gangrene antitoxin. This is serum or a preparation from serum, containing the antitoxic globulins, which have the specific power of neutralising the toxin formed by *Clostridium oedematiens*. It renders the toxin formed by *Clostridium oedematiens* harmless to animals.

Antitoxinum Staphylococcicum.—*Staphylococcus* antitoxin is serum or a preparation from serum containing the antitoxic globulins, which have the specific power of neutralising the toxin formed by certain strains of staphylococci. It renders the toxin, formed by such strains harmless to animals, and neutralises its lytic action, when tested *in vitro*, on the red blood corpuscles of the rabbit.

Antitoxinum Vibriosepticum is also gas gangrene antitoxin (*Vibrio septique*) and is serum or a preparation of serum, containing the antitoxic globulins, which have the specific power of neutralising the toxin formed by the *Clostridium*, commonly known as *Vibrio septique*. It renders the toxin formed by the *Glostridium*, commonly known as *Vibrio septique*, harmless to animals.

Serum Antipneumococcicum I.—*Antipneumococcus* serum (Type 1) is serum, or a preparation from serum, containing the immune substances which have a specific therapeutic action when injected into persons suffering from certain diseases due to *Diplococcus pneumoniae* (Type 1). This serum is not to be used later than two years after the date of manufacture.

Serum Antipneumococcicum II.—Here suitable strains of the second type are used.

Detailed accounts of methods for biological assay of the sera are also given.

The other recommendations of the commission include minor modifications of standards of existing drugs and their preparations and suggestions for sterilisation of various injections.

SPECIAL ARTICLES

1. Holidays and Hobbies for Medical Men

BY

V. ISWARIAH, B.A., M.B., M.R.C.P.

A layman is alleged to have remarked "What do the neat attire discover in these medicoes but a gruesome mind and an apathetic soul whose business is to be associated with sordid aspects of life—*sin, suffering sepsis, sputum, stool* and many another pathologic specimen." An attempt is made to examine this statement (ignoring the alliterative emphasis) with reference to one reason in justification of it. The average medical man in India however skilled he may be in the art and science of treating physical ailment, has neglected to tend his own mind and soul. Care for his mental (which embraces physical) hygiene demands regular and periodic holidays. If this is true of any one who claims to have a mind, it is so fourfold for a medico. It is a truism to state that a heavy dividend is declared in the shape of his own happiness to a man who attends to his mental health by regular holidays. A good financial dividend is of course guaranteed to a man who works day in and day out years on end, but with the inevitable mental sequel to it. Humphrey Rolleston in an article in the *Practitioner* some time back observed that holidays and hobbies the two alliterative allies of health and happiness of

which no profession than ours stands in greater need, are often neglected by the hardworking medical practitioner. He added that the medical practitioner, whatever sound direction on the subject he may dispense to patients, does not set a good example himself. Fortunately this accusation the practitioner in this country is innocent of, as he neither takes holidays himself nor prescribes this to patients.

It has been said of marriage that anticipation is more than half the pleasure. Is it true of holidays too? The average Englishman or woman is said to work in anticipation of his or her holidays. This anticipation far from undermining the efficiency of the work, renders it rather a burden light and a yoke easy. It is difficult to visualise a world without holidays though we admit that we do frequently come across those who appear to get on very well without them. Tim Linkinwater in *Nicholas Nickleby* tells the reader that for forty-four years he had carried out a certain routine in the interests of his employees, Cheeryble brothers and for a like period slept all without a break in the back attic. A pretty thing at this time is to be away

but he was neither going to sleep in the fresh air nor was he going into the country. There are a good few who do not avail of holidays in the legitimate sense, who yet make some change in their occupation which affords relief from the monotony of the common round and daily task. One such being stays away from the office each year for a fortnight in June. Nobody could ever discover where he had been; and when he dies perhaps his wife affectionately reveals "My husband never went away from home. He used to sleep practically all day long in the room and when it was hot, in the terrace". He is the man who jauntily says 'It does me just as much good as going away to Brighton and Blackpool or Ooty and Kashmir and you see it is so much cheaper'. To a being allied to the above a business visit to the metropolis, or a summons to a sessions case to a distant district, are of the nature of a holiday.

In him very often the money saving mania runs parallel to leave saving psycho neurosis. The leave saving psych neurosis is associated with anxiety neurosis with regards retirement when he would like to prefix a couple of years full average leave to his pension. (Need one wonder that there was a threat of the abolition of the reserve in service for leave takers and holiday makers.)

In an instructive article on early mental symptoms (*Practitioner* July 1936) R. D. Gillespie gives his findings in a group of 37 cases with anxiety psycho-neurosis. The traits that he detected as having existed most commonly before the onset

of the illness were "Concentration work to the almost complete exclusion of recreation, yet often with actual dislike of their particular job."

Many an unseasoned booby avoids a holiday as it makes him leave the comforts of a home and perhaps the mothering of his wife for a crowded lodging in a seaside home or a hotel on the hills. But indeed the perverted being is he who boasts and courts merit for having worked for five and ten years "without taking a single day's leave". If a lawyer and a teacher work for five days and a business man for six, the medico works for seven. Therefore he brags in his record breaking attempts of endurance. There have been instances of eleven miles sprint in an hour. Hiking for six days covered 624 miles. Men have been floating or swimming for 27 hours. Two teams once contested a tug of war pull for 2 hours and 41 minutes. At a stretch club swinging has been achieved for 130 hours and uninterrupted piano playing for 120 hours. In line with these scores medical men could boast that they have worked for five and six years without 'Taking a single day's leave'. Such zealous devotion to the profession, either practice for humanitarian reason or the pursuit of the science for academic consideration may have produced luminaries of whom the profession is proud, but is not the profession equally proud of her renegades and stowaways who have brought her credit because of their apparent neglect of it? Many and various are the gifts that Medicine has conferred through her truants and runaways to science, literature, law and the state. Some

of these had great skill and repute in the practice of the profession, others were indifferent to it and a good few abandoned it. But all were distinguished by having achieved celebrity in other fields. Lord Moynihan in his Linacre lectures this year gave a list of such truants. Linnæus whose name is primarily associated with Botany was a doctor of Medicine of Upsala. That great expositor of the theories of Darwin in Huxley took his medical degree in 1845. Berzelius the greatest chemist of the day was the Professor of Medicine at Stockholm. Are not Thomas Young and Helmholtz brilliant examples of medical men who found their true bent in Physics? Many men have distinguished themselves more in the domain of literature perhaps to the disadvantage of their patients. Sir Thomas Browne is said to have written his *Religio Medici* on a holiday for his non-medical exercise. Philosophers and students of natural history sought consultation for his wide and remote knowledge. The favourite physician of Queen Anne, John Arbuthnot was a much sought after wit of Dr. Johnson's coterie. Tobias Smollette, Oliver Goldsmith, John Keats, Robert Bridges, Conan Doyle and even Sir Ronald Ross are a few more of such *renegades* from the profession. Oliver Wendel Holmes was a Professor of Anatomy at Harvard and he was so conscious of his non-medical propensities that he often said of himself that he occupied not a chair but a whole settee. Many men have given to the more exciting if less grateful world of politics their spare energies which were perhaps intended for a round of patients. One has only to conjure up such names as George Clemenceau

the tiger of France, Sun YatSen, the father and first president of the Republic of China. Ansari in India, Jameson who is associated with the Transvaal raid of 1895, Viscount Finlay an M. B. of Edinburgh who ended his career as Lord Chancellor and later a judge of the Hague Court etc. Lord Moynihan concluded with an injunction to his co-professionists to indulge in other forms of culture apart from his own-what the Estonian would call 'Play by the side of work'.

What then are methods of holidaying? Speaking generally the best holiday is indeed that which will afford most pleasure, change and rest. Pleasure is too wide a word but the connotation to an enlightened mind is all that we are concerned. Some need primarily rest for the mind to ensure rest for the body. The judicial and the teaching professions are counted the one that demand rest of this nature, and hence a couple of months respite is enjoined by state regulation even in our country. Others need more than anything else a change of scene. The plutocrat who is at rest all his life demands a holiday of this nature. A good few are benefited by a change of food. The student who is away from home in the city claims this. But to all it is seldom wise to do anything approaching what you are doing during the remainder of the year, to occupy oneself exclusively in the same old way only in another place. With many, a change of companionship is one of the concomitants of a holiday to do good. Judged by this again the average medico is guilty as he invariably lives if apart from the 'Sepsis sputum-stool' atmosphere in a world

of his own profession. The exclusive company of every workaday associate and colleague inevitably leads to mental constipation unless variegated by a freer association on a wider basis with the world outside and abroad which has on the other hand a mental cathartic effect. It was a friend of Carlyle who gave the sage of Chelsea and his wife the advice 'Vary the scene, old beans'. Yet the reverse is true too. A foreigner in the tropics sometimes falls a victim to neurasthenia. If it is not due to high living and no thinking, it is due to his exile from home with too much money in the pocket and yet suffering loneliness and lack of congenial society. Living as he does amidst the indigenous population which causes annoyance as he never troubled to understand its language or its psychology, troubled by ants at breakfast, flies at lunch and moths at dinner, beset all day by sodden heat, need one wonder that he is ordered a holiday. The holiday for him is to get back to his kin and national environ to pick up. The choice and programme for a holiday therefore deserve a detailed consideration for it to be worth while, the psychic effect being at least as important as the physical.

Can one overdo holidays? Here we should give heed to the cry that goes up often that people work too little and play too much, particularly women of the west. This view is reinforced by the capitalist who is against the reduction of hours of work for labour though he excludes himself from the purview. But one does often observe in holiday stations and on cruises men abandoning themselves to the so called holiday spirit thereby

overdo and yet bluff themselves that they are enjoying. Was it Shakespeare who observed "If all the year were playing holidays, to sport would be as tedious as to work". Apart from an intense holiday how many of us have experienced a prolonged holiday of three months a year, get boring at the end of it. But these are no arguments against regular periodic holidays. A labourer is worthy of his hire indeed, but don't men observe the happy sight of even an indolent landowner or a zamindar or any other variety of plutocrat who judged by all the canons of life is a veritable drone in the hive of the present social order (who has aptly been styled the fifth wheel in the coach of civilisation) also enjoy a holiday? The enthusiast of the holiday goes a step further sometimes to join hand with the philosopher and the psychoanalyst of the Erudian school to prescribe for himself and others a moral holiday as well. Obviously the medical man calls a halt at this stage, as the very principle of a holiday is negated by indulgence in Bacchus, Venus, gambling etc. A gastronomer's holiday is to adventure in strange dishes and wines and fruits—to get back to work with a gastrointestinal upset. Fortunately however unlike the west, holidays are not overdone here but woefully underdone. The medical profession in this country particularly down south stands guilty of the charge of having neglected to assess the value of holidays.

In concluding, perhaps the greatest plea of all in favour of holidays is that they tend to give life a truer perspective. For those who take

life seriously at one time or another and find that their surroundings have become stale and unprofitable that 'time is out of joint', life takes on a brighter aspect after a holiday. Return after a holiday confers renewed energy which to many connotes renewed hope. From a medical point of view the most important aspect of the ordinary holiday is prophylaxis, which is the prevention of the onset or arrest of the course in an early stage and to bring relief to recreate a tired mind. The other day when a momentous discussion was on in parliament (what Mr. Lloyd George described as the most solemn and serious debate in which he had participated) the leader of the opposition accused the Premier and the leader of the house of being absent. And where was the culprit? Mr. Baldwin was away at Chequers "On a Holiday." Was it irresponsible pleasure hunting or was he away on the advice of his doctor who had prescribed the holiday to cure his physical or nervous breakdown?

No the man felt like a holiday and lo, he was away. Common sense in him directed the prophylaxis of a holiday. (*Vide* report of the parliamentary discussion on raising the sanctions on 29-6-36). Something is indeed wrong with a man, more a medical man who does not feel like a holiday after four, five and more years of continued work.

From a rational point of view the other function of a holiday with its necessary adjuncts is to infuse into the oyster of a medical man a few rays of light and knowledge. If the legal profession could boast of many a smatterer whose attainments just suffice to elevate him to the dignity of a bore, well could the medical profession boast of many an ignoramus whose innocence depresses him to the insignificance of a dunce. (Professional attainments have no place here.) The cheery spirit of a medico is the envy of many another profession. Pray let not the spirit be the outcome of ignorance but rather the off spring of depth.

2. Visionary's Vision of the Mammalian Embryo.

By

M. J. S. PILLAI, L.R.C.P., ETC., D. R. (EDIN.).

Imagination running riot.—Production of chaotic condition in the mother followed by the discharge of the ovum. Exchange of greetings between the ovum and the spermatozoon by positive chemiotaxis. Emotional contact after the greetings resulting in surgical trauma. Thereafter the electrical changes are followed by physiochemical adjustment. Electrolytic and ionic changes bring further unification of the two uni-cellular structures into one. The corpus luteum persists and stimulates the anterior pituitary of the mother. Increased motility of the impregnated and ciliated ovum and the consequent resistance of the mother's organism to the newly imported condition. In spite of this the ovum now gets anchored by its pseudopodia. Formation of the placental sinuses and exchange of stimuli and material, from the parent to the offspring and *vice versa*.

Changes in the electrical polarity of the cells and production of neutral zone in middle ending in division of the cell. Subsequently the repetition of this process results in the multiplication of the cells by the rearrangement of the reticulum and the nuclei.

The human embryo.—The controlling factor of evolution appears

to be inherent in the spermatozoon for the production of the human embryo. The particular function of the ovum is merely to take a passive part in supplying the necessary human pabulum, apart from the general biological function of the cells of the particular species. The different parts of the spermatozoon and their constituents act as the chief regulating mechanism in the elaboration of the different specific cells. The chemical and the electrical affinities are controlled by the general biological function of all cells, mass action followed by selective action of the particular cells resulting in differentiation of the cellular mass into three layers with the formation of tubular organs namely the neurentronic and the celimic canals. The chemical and the electrical affinities are controlled by the nuclei of the cells, as protons are related to the electrons of an atom. Mass reaction of the cells and their interrelation with the specialised layers of the embryonic cells leads to the necessary evolutionary changes. Differentiation and organisation of cellular accumulation are governed by chromosomes of the particular species, which chromosomes appear to represent in the later life in the form of reticulo-endothelial cells.

The positive chemiotaxis between the differently tuned cells persist in the sexually differentiated organism which reaches its maximum intensity when the adult stage is reached when all the endocrine glands reach the stage of optimum intensity, conversely this intensity decreasing with the lessening of the activity of the endocrine system.

The neurentronic system forms subsequently into the nervous system and the enveloping skin organ. The other parts of the cell mass in the natural surroundings give rise to cells forming the mesoblastic and hypoblastic organisation. The interrelation between these layers appears to be governed by electronic changes engendered by the nucleonic principles of protons. The invagination of the organised cells giving rise to canalisation and the inner covering given to such organised cavities or canals and the intervening cellular organisation appears to be brought about by relative organised electrical disturbance. The formation of the plexes, cords and nerves along with the growth of the extremities and the spreading of internal covering of the mesoblastic tissues being governed by electrical stimulus and inter-related biological adjustment. The formation of canalised organs is exemplified by the central nervous system. The cavities of the brain and the spinal cord being formed by the fusion of all different parts enclosing the cavity within, around which cells develop, congregate with intensification of certain cells, some becoming pigmented and others remaining un-pigmented. The pigmented cells are elaborated from the nuclei, the centre of physical activities governing the cellular metabolism.

The elementary distribution of the principal forms of energy into corresponding specialised sense organs appear to be derived from the energy of the five main elements. The formation of foetal organs are governed by maternal blood containing hormonal secretions from each individual organ of the parent which helps in the differentiation of the cells in the formation of the corresponding foetal organs. And as stated above the foetal organs send corresponding stimuli to the maternal organs for the symbiotic existence of both. The development of the embryo appears to be based on the principle of atomic theory and governed by particular secretions from the particular organs of the particular mammalian mother in the early stages, spermatozoon, ova and the chromosome determining the species. Initial activity of the spermatozoon producing trauma, electrical disturbance, all contribute to the initial release of energy in the formation of embryo.

The trauma of the ovum and the constitutional changes in the impregnated ovum and the increased activity and the motility of such a fertilised ovum help to throw out pseudopodia along with general ciliary formation around the covering membrane of the embryo. The secretion of substances of proteolytic activity and fixing of the ovum on the placental site marks the first stage. The second stage is the enlargement of the placental sinuses, the non-functioning of the germinal layer of the ovum and the stimulation of the anterior pituitary by the ovarian hormone. In the third stage the hormones of the mother, stimulating the embryonic cells, the differentiation of the

various organs being guided by maternal blood in response to stimuli from the foetal organism, hormones in particular, the embryonic cells cry for more hormones of the mother, which results in the general hypertrophy of the glands in the mother. The maternal organism in general is stimulated to general activity by foetal stimulation. Sexual differences are being governed probably at the time of chromosomic fusion and redistribution. In general, the new comer starts the indigent life, becomes a parasite, then lives a symbiotic life and eventually thrown out when the interaction between the foetal stimulus and the maternal response is neutralised when the fully developed ovum becomes a foreign body. The neutralisation leads to arrest of the forced activity of the anterior pituitary and the activity of the posterior pituitary in expelling the foetus. The electricity evolved during this period of the action and reaction of the foetus with the maternal organism playing an important part in the ionization of the chemical substances of the organism and the re-arrangement in accordance with the law of demand and supply. At this stage the general tendency for maternal thyroid to hypertrophy or in its failure the exhibition of symptoms of hypo-thyroidism are to be noted. The further development and existence of the embryo depending upon the demands of the foetus and the ability of the maternal thyroid to supply accordingly.

Our vision was then directed to the research laboratories of the world wherein one found the germinal layer of the ovary of a rabbit in the form of a pulp mixed

up with the pulp of testicular substance of male rabbit being cultivated in pabulum of blood of the female rabbit taken from different impregnated rabbits at the corresponding stages of development, as the experimental embryo *in vitro*.

This conglomeration of material was subjected to an electric charge, the equivalent of the normal electrical energy as gauged by the electrocardiogram of similar rabbits' heart. This amount of electrical energy produced by the action of the heart in moving the microscopic galvanometer is continually passed through the conglomeration of cells under cultivation *in vitro*. In these experiments cells began to grow and multiply, different organs formed by re-arrangement of the cells, under conditions closely approximating the foeto-maternal factors. The blood of a rabbit at the stage of corresponding month of pregnancy was made to surround the mass of the growing embryonic cells, the two being separated by a specially prepared colloidal permeable membrane. The whole being kept under blood temperature in an auto-clave; the circulating blood was renewed as often as it was necessary and we found in due course from this conglomeration of cells a full embryo had developed—an embryo which appeared to be indistinguishable from the natural embryo of a rabbit at about the time of expulsion after full term.

We tried to play with that beautiful young creature. It would not respond. We gave injections of Scheele's fluid, Pituitrin etc, performed artificial respiration for hours and hours, but lo, the organism

was cold and all our prayers, entreaties were of no avail. Then we bent down on our knees and admitted to the sources of all energy that there is something greater than man, which guides the destinies of the Universe, which can convert a sterile body of the earth thrown out from the burning sun into a body teeming with myriads of life

in due course. All our cherished attempts at a laboratory creation of life proved futile and in our impotent rage we determined that we will take another birth and go on experimenting until we succeed in creating the life. We took leave of each other and departed. That was the end of our Vision of Visions of a Visionary in this subluminary abode.

Clinical Memoranda

HYPER-PITUITARY SYNDROME (GONADOTROPISM).

By

M. J. S. PILLAI, L.R.C.P. & S., ETC., D.R (UNIV. EDIN).

Medical Superintendent, The Barnard Institute of Radiology,
Government of Madras.

Adverting to the publication in the December 21st, 1935, issue of the British Medical Journal, under column—queries and answers with reference to *priapism*, I have to bring to the notice of the profession a very interesting case of *priapism* and I would like to have their comment.

Patient.—Hindu, male, aged 50 years, was a fairly well-developed individual and suffered from the symptoms of a type of hyper-pituitary syndrome.

He was admitted into the Government General Hospital, Madras, on the 11th February 1935 (under Dr. Gurusawmy Mudaliar).

Complaint.—Pain in the head followed by mental depression and abnormally increased sexual desire for the previous four years.

Previous History.—Patient suffered from continuous erection of the penis from 1905.

He contracted the habit of self-abuse which he had to indulge in frequently. He was married late in 1907. His health failed, due to excessive sexual indulgence. A resection of the dorsal nerve of penis was done in 1910, without any tell-

ing benefit. In 1912, both testes were removed.

The distressing symptoms still continued. Then a partial amputation of the penis was done early in 1915. Finding no relief, a complete amputation of the penis was done late in 1915. Still the desire for sexual intercourse continued and he had to satisfy himself by irritating the stump of penis by a circus movement, which produced white discharge and this appears to have given him a sense of satisfaction. Within the first few years of his marriage, he had a daughter.

Laboratory Note —

Urine alkaline	...	10.15
No sugar		
No albumin		
Phosphates present		
Blood pressure	...	110/70
Basal metabolic rate		plus 37%
Blood count W.B.C.	...	16,562
Polymorphous	...	46%
Lympho	...	46%
Large Mono	...	3%
Eosinophiles	...	5%
Haemoglobin	...	35%
Glucose tolerance test :—	...	
Blood sugar before glucose	...	122%
½ hour after	...	14 %
1½ " "	...	133%
2 " "	...	122%
Blood Cholestrol	...	133%

Rectal Examination.—A large rounded mass felt by the tip of the middle finger in its anterior aspect caused by enlarged prostate.

General Condition.—Patient was not ill-nourished, not anaemic; teeth are not clean; P.A. present. He always told his history and made involuntary contortions of neck. Gait was staggering. He closed his eyes sometimes. Touch, pain and sensation were normal. Cranial nerves normal. Abdominal reflexes, knee and ankle jerks were normal.

Radiological Findings.—The sella turcica normal in size and shape. Posterior clinoid processes slightly thickened. No evidence of increased intra-cranial pressure or thickening of skull.

The spinal cord was about to be explored after lipiodol injection and analysis of the cerebro-spinal fluid was about to be done; and clinical photo was arranged for, when the patient disappeared suddenly.

Treatment with laxatives and bromides only produced temporary relief.

Radiation Treatment.—Deep X-Ray Therapy for pituitary was given.

A CASE OF MULTIPLE HYDATID CYSTS IN THE PERITONEAL CAVITY.

REPORTED BY V. R. THAYUMANASWAMI, M.B.B.S.,

King George Hospital, Vizagapatam.

One Kondamma, aged 45 years was admitted on 19-8-35 into the K. G. Hospital, Vizagapatam, under Dr. M. G. Kini, 2nd Surgeon, for treatment of swelling of the abdomen.

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Summary.—

A fairly normal individual to start with. On reaching the age of 20 developed extraordinary sexual appetite. Masturbation gave temporary relief. Marriage followed by excessive sexual indulgence resulted in general weakness. Father of one child. Resection of Dorsal Nerve of Penis, partial and complete amputation of penis afforded no relief. Irritation of the stump gave a partial satisfaction, resulting in white discharge, probably prostatic. Bromides afforded only temporary relief. X-ray exposures to the Pituitary were begun but when he felt a little better he would not remain in the hospital. After discharge, he went home and died about the 25th of May 1935.

Prostatectomy was not done.

With acknowledgments to :—

1. Captain T. W. Barnard, Director, The Barnard Institute of Radiology, Government of Madras, Madras,
2. Dr. M. R. Gurusawmy Mudaliar, B.A., M.D., C.M., Physician, Government General Hospital, Madras,

Married, had one child 6 years back which died at about the 3rd year. No abortions. The duration of the present illness is 10 years. The tumour started in the right hypochondrium and was in the

beginning about the size of an orange. It gave her some discomfort only. The mass grew gradually and has attained the present size. For the last 3 years her periods were suppressed and before that for about 5 months her periods were scanty but regular. The birth of her child was a tedious labour lasting 5 days.

Micturition : normal.

Discomfort after food she had from the beginning but, this has increased during the last 8 years. Bowels : irregular and constipated.

Local condition.—The abdomen shows an irregular swelling more marked on the right side and when the patient stands can be seen to extend from the right side of sacrospinalis to the midline in front. The tumour moves with respiration.

Palpation.—There is an irregular nodular tumour occupying the Right side of the abdomen, filling the whole of the right hypochondrium, epigastrium, lumbar and umbilical regions and slightly encroaching on the right iliac region. A small mass is felt discrete 1" to the left of the midline below the subcostal margin. The tumour is freely movable in transverse direction and from above downwards and freely with respiration. The edges are rounded and irregular and it can be distinctly palpated all round.

Percussion.—Tumour is resonant except in the right flank. A peculiar fluid thrill is obtained with the fingers, more so on the right side below the costal margin.

The abdominal wall is lax and devarication of recti present.

General condition.—Poorly nourished, no anaemia, no jaundice. Heart and lungs : nil abnormal.

Urine.—Alkaline, no sugar, no albumin.

Motion.—No ova seen.

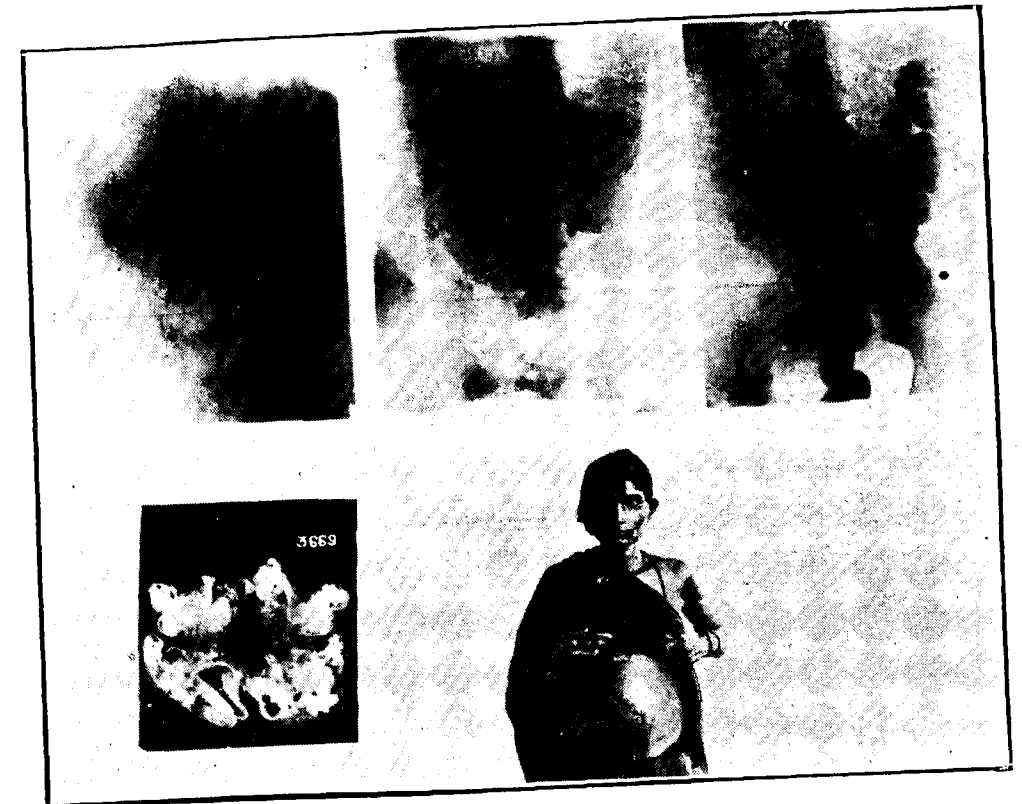
Blood.—W. B. C. 8,000. Polymorphs 59%. Eosinophils 15%. Lymphocytes 20%. Mononuclears 5%.

B.P.—120/80.

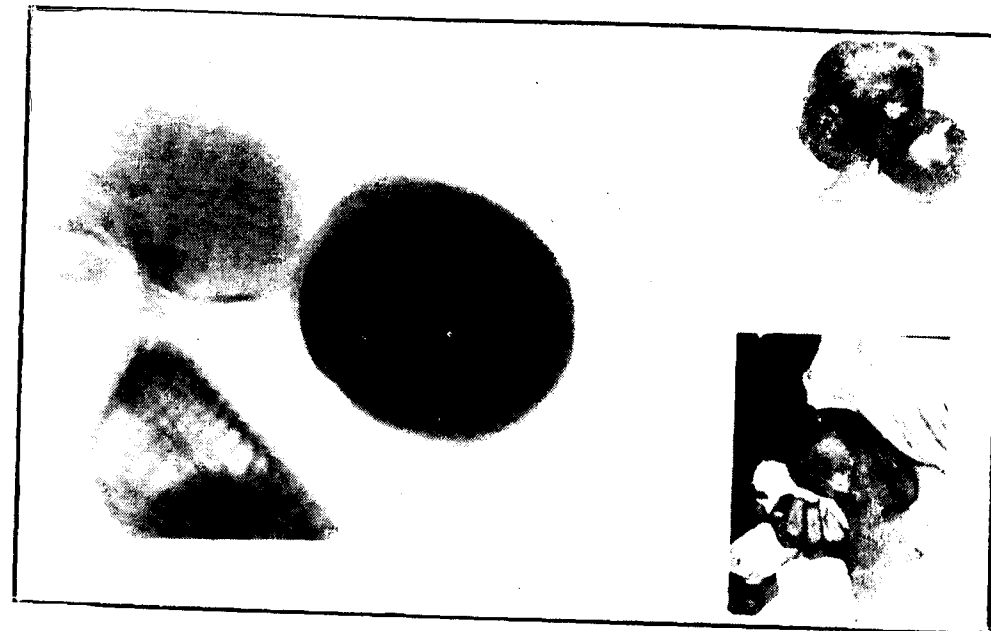
P.V.—A slight prolapse of the uterus, cervix, coming down almost to vaginal outlet. Uterus retroverted and slightly larger than normal. Fornices clear.

X-Ray picture of the abdomen shows some calcified spots. Barium Enema picture shows ascending colon and hepatic flexure shifted to the left side.

A diagnosis of Hydatid Disease of Peritoneum was made and operation was performed by Dr. M. G. Kini on 26-9-35. Under ethyl chloride, ether oxygen sequence the abdomen was opened with a left paramedian incision. On opening the abdomen a cyst of the size of a tennis ball adherent to the small intestine below and the great omentum above was found. Multiple cysts of various sizes extending from the right hypochondrium to the pouch of Douglas were seen scattered adherent to parietal peritoneum along the para colic gutter. One was removed from the pouch of Douglas and another big one from the right Fallopian tube. Both cysts were sent to the pathologist. The whole peritoneum being studded with cysts adherent to bowel wall in places, it was considered



Kondamma—Case of Multiple Hydatid cysts in the Peritoneal Cavity
(Dr. Thayumanaswamy's Case.)



unsafe to do anything and so the abdomen was closed in layers.

Post operative.—Had no complications except distension of abdomen which was relieved by the usual routine. Was discharged on 20-9-35. Weight to begin with was 88 lbs and at discharge 106½ lbs.

My thanks are due to Dr. M. G. Kini, M. C., M. B., M. CH. (Orth), F.R.C.S.E., 2nd Surgeon, King George Hospital, Vizagapatam for permission to report this case from the records of the cases treated in his wards, and to the Superintendent, King George Hospital, Vizagapatam.

A CASE OF MENINGOCELE.

REPORTED BY V. R. THAYUMANASWAMI, M.B.B.S.,

King George Hospital, Vizagapatam.

One V. Appa Row, aged 3 months, was admitted with a pedunculated tumour of the back of the head since birth.

Size.—6½" by 6". Shape: oval; surface smooth; consistency: soft and cystic, gets tense when child cries.

Tumour situated in the occipital region since birth; first of the size of a mango but now as large as the head itself. Gets tense on crying.

On 12-12-34: 165 c.c. of C. S. F. removed and 165 c.c. of Oxygen introduced and X Ray picture taken. Picture shows absence of cerebral substance. A case of pure Meningocele.

Child very emaciated, circulatory system normal, respiratory system normal.

Local condition.—Inspection: Tumour is pedunculated and hangs from the occipital region of the head. Skin over tumour is pinkish red in colour and glistening, prominent leash of veins noticed. No pulsation seen.

18-12-34: Operation by Dr. M. G. Kini, 2nd Surgeon, K. G. Hospital, Vizagapatam. Under local anaesthesia, the tumour was removed and the meninges of brain stitched water tight.

Palpation.—Tumour is warmer than the rest of the body. Pedicle seems to communicate with a persistent posterior fontanelle.

26-12-34. Stitches removed, wound healed by 1st intention.

Reported by kind permission of Dr. M. G. Kini and the Superintendent of King George Hospital.

A CASE OF EVENTRATIO DIAPHRAGMATICA.

REPORTED BY DR. P. KUTUMBIAH, M. D., M. R. C. P.

A. Hanumanta Rao, age 5 years, Hindu male child, Vizianagaram.

Complaint: Vomiting and wasting; duration since a few weeks after birth.



(Before Operation.)



(After Operation.)

Appa Row—Meningocele.
(Dr. Thayumanaswamy's Case.)

Previous history: Patient's mother says that from a few weeks after birth, the child used to have vomiting. Since the last one year, vomiting is not constant but comes on once in two or three days and the quantity brought out with each vomiting being much more than the food taken. There is no previous history of fever or any other acute illness.

Physical signs and condition on admission: Weight 18 lbs.; patient emaciated; tongue clean with a patch of glossitis at the tip. Chest pigeon shaped with marked prominence of sternum and sinking in of costal cartilages. There is a well marked "rickety rosary" on left side.

Respiratory system: Inspection: movements of chest abolished over the left and limited over the right side. Marked wasting of the supra and infra spinati. Percussion: Percussion note resonant over the left side and also over the back and impaired over left infraclavicular fossa. After barium meal percussion note impaired over the whole of left side. Auscultation: Breath sounds suppressed over left side and puerile over right apex, very feeble over left back and puerile over right back.

Cardiovascular system: Apex beat not visible; marked visible pulsation over third and fourth interspaces

just internal to the right mid-clavicular line. Apex beat palpable in the right fifth interspace half an inch internal to the right mid-clavicular line. No murmurs, no thrills.

Alimentary system: Abdomen distended, no visible peristalsis; liver palpable to three fingers breadth below the costal margin and not tender. Spleen not palpable.

Report of the radiologist:

(1) The diaphragm is very high at the level of 3rd rib on the left side. (2) The heart is pushed to the right side. (3) Only the apical portion of the lung visualised. (4) There is a cavity below the diaphragm which contains air.

Screen examination with barium meal: Cardiac opening at level of 6th dorsal vertebra. The cavity which was filled with air is the cavity of the stomach, markedly dilated.

Radiogram after a barium meal confirms the above noted findings.

24 hours picture shows barium in the stomach and the large intestines with the transverse colon, splenic flexure and a portion of descending colon in the thoracic cavity. There is no rotational error in the gut visualised.

A CASE OF EARLY SUBACUTE COMBINED DEGENERATION.

BY DR. P. KUTUMBIAH., M.D., M.R.C.P.

V. Chandramma., 30 years, female, Hindu, Cooly, Agrapharam near Alamanda. Admitted on 17-1-1935 and was discharged on 2-3-1935.

Clinical Memoranda

Complaint: Tingling and numbness in the hands and feet. Pain in the abdomen, indigestion and diarrhoea.

Duration: one and a half years.

Family history: no history of such complaint in the family.

History of previous illnesses: no history of syphilis.

History of present illness: the present complaint began after the death of a child, 7 months old.

Physical condition on admission:

General: a moderately nourished lady of about 30 years. Anaemic. No oedema in any part of the body.

Nervous system: Intelligence fair. There is generalised wasting of the muscles of the body. No fibrillary twitchings anywhere. No deformities present. Gait: normal, Romberg's sign: negative; Cranial nerves: normal; Pupils: equal on both sides and react to light and accommodation.

Sensations: light touch lost over hands and feet, sensations of pinprick, heat, and cold are normal, joint sensibility is intact; pressure sensibility normal; no hyperaesthesia of calf muscles.

Reflexes: abdominals brisk; Babinski present on both sides; Knee jerks, ankle jerks, biceps jerks and triceps jerks are all exaggerated on both sides. No sphincter disturbances; no muscular inco-ordination; muscular power poor.

Alimentary system: Angular stomatitis present. Tongue moist and patches of glossitis present on

the dorsum; teeth coated with tartar and P. A. present. Abdomen not distended. No liver or spleen felt.

Respiratory system: nothing abnormal.

Circulatory system: nothing abnormal.

Investigations done: Urine: slightly acid, specific gravity 1008, no sugar, no albumin, no bile salts or pigments.

Motion: No ova present.

Blood Count: R. B. C., 1.6 millions. Hb. 35%, Colour index 1.2, Picture: anisocytosis, poikilocytosis, megalocytosis. Van den Bergh's reaction—direct: negative. Indirect: positive, very faint. Fragility of R. B. C.: Haemolysis begins in 0.5% saline and complete in 0.3% saline.

Wasserman reaction: negative.

Cerebro-spinal fluid: fluid clear and under slight pressure.

Biochemical report:

Protein-10 mg. per 100 cc of the fluid.

Globulin-nil.

Chlorides-650 mg.

Sugar-58.8 mg.

Cells-nil

Wasserman reaction: negative.

Fractional test meal:

Fasting stomach: empty; later specimens—free HCl absent; total acidity: very low; Bile: nil;

blood : nil ; Mucus : normal. Motility : extreme hypermotility. Stomach empty in $\frac{1}{2}$ hour.

Conclusion : achylia, marked hypermotility.

The special features of this case are :

1. Occurrence of the disease in a young woman of 30 years.

2. Generally the posterior columns are involved before the lateral columns are affected. But here the pyramidal columns are involved while yet there is no evidence of involvement of the posterior columns.

3. There is no familial incidence as far as the history is concerned.

4. The rapid signs of recovery as shown by the improvement of the patient's blood from 35 per cent Hb to 60 per cent Hb and 1.6 millions R. B. C. to 3.4 millions R. B. C. in a short period of treatment with iron and liver shows that the course of the disease can be checked when diagnosed at an early stage.

5. Iron should be given in massive doses.

6. Rest and eradication of septic foci are also important.

A CASE OF ACUTE LYMPHATIC LEUKAEMIA OF A HAEMORRHAGIC TYPE

BY

B. V. VARADA ACHARYA, B.A., M.B. & C.M.

AND

P. S. VAIYANATHAN, L.M.P.

(Government Headquarters Hospital, Ramnad.)

Name : Sultan.

Caste : Mohamaden.

Sex : Male.

Age : 18 years.

Occupation : Cooly in a boat.

Date of Admission : 22nd June 1936.

Date of discharge : 3rd August 1936.

Complaint : Fever, bleeding from the gums, passing of blood in the stools.

Duration : 15 days.

Previous history : Patient was accustomed to get attacks of malarial fever from his infancy.

History of present illness : Two weeks ago, the patient developed fever. Two days after fever commenced, he began to bleed from the gums and small quantities of blood appeared in the stools. Very soon the stools became completely tarry in colour.

Condition on admission : Patient was anaemic, the pallor of the face

being specially noticeable. Tongue was pale but coated with traces of blood. Subconjunctival and petechial haemorrhages on the different parts of the body were present. Gums were swollen and constantly bleeding.

Bowels were moving 5 to 8 times a day, the stools being of semi-solid, or liquid consistency and tarry in appearance. The quantity of dark blood passed at times was very large and alarming. There was no bleeding from urethra. Spleen was enlarged and hard, its lower margin being 4 fingers breadth below costal margin and its anterior border extending to the middle line of the abdomen. Liver was enlarged, its lower border 4 fingers breadth below costal margin. Abdomen was slightly distended and not tender. Heart and

lungs were normal. Heart's action was rapid. Lymphatic glands throughout the body were enlarged in neck, axillae, groins and probably abdomen. The glands were discrete and not tender, varying in size from a small bean to an almond.

The temperature remained between 100 and 102 degrees for the first 8 days and then it became irregular ranging from the normal to 100 degrees. Pulse was rapid and small—between 100 and 120 per minute. Respiration 25 to 30 per minute. Urine was normal.

Diagnosis : (1) The case could be easily mistaken for *purpura haemorrhagica*. In fact this was the diagnosis made in the Out-patient department.

(2) With the accompanying fever, enlarged spleen and liver it could be

taken for Kala-Azar or chronic malaria; both of which are common diseases in the locality from which the patient came—Kilakarai in Ramnad District. The existence of enlarged glands all over the body and the blood picture revealed the true nature of the case.

Total count of leucocytes: 110,000 per c. m. m. Relative count gave the following result :—

Polymorphonuclear	4.3 %
Large Hyaline	1.3 „
Lymphocytes	91.5 „
Eosinophilia	0.5 „
Transitional cells	1.3 „
Myelocytes	1.1 „

A few nucleated R. B. Cs. were noticed. No Mast cells.

Haemoglobin 55 %

Treatment and progress of the case :—

Calcium chloride 10 grains in 10 C. C. of sterilised water was given intravenously daily for 8 days. Haemoplastin 2 c. c. was also given in addition intravenously for the first 3 days. He had 2 doses of 0.1 gm. of Neosalvarsan also, during this period. He was put on a diet of orange juice and whey. This treatment controlled the severe bleeding he had from rectum and the gums.

2-7-36. Stools normal, general condition better, but patient complaining of general weakness. Slight bleeding from gums continue. Patient put on milk and congee. Calcium lactate 30 grains three times a day is being given by mouth. N. A. B. 0.1 gm. intravenously.

6-7-36. N. A. B. O. 1 gm. intravenously. Calcium lactate by mouth continued.

9-7-36. Sulpharsenol, 6 cgms, intramuscularly.

10-7-36. Slight bleeding from gums continues. No bleeding from rectum. Patient complains of a blocking sensation in the ears and neuralgic pains in both legs. His appetite is much impaired.

11-7-36. Subcutaneous haemorrhages in front of the chest. Patient has a rise of temperature reaching to 101 degrees.

15-7-36. A thin streak of blood in the stools noticed this morning. Calcium chloride 10 grains given intravenously, in addition to Ca lactate by mouth.

16-7-36. Spleen has increased in size, its lower border being at the level of the umbilicus: liver 2 fingers breadth below ribs. (It was 4 fingers breadth below the ribs at the beginning). Condition of glands same. Pallor of the face continues; slight bleeding from gums also continues. Heart shows a well marked haemic murmur. No bleeding from rectum. Neuralgic pains in the legs persist. Temperature keeping up between 99 and 101. Calcium lactate by mouth repeated. Sulpharsenol 6 cgms. given intramuscularly.

21-7-36. Fresh subconjunctival haemorrhage noticed in left eye with purpuric haemorrhage on the face. Patient has developed bronchitis; he is getting more emaciated and anaemic. General weakness more marked.

23-7-36. Fresh purpuric spots noticed on the chest wall.

24-7-36. Oedema of feet noticed.

3-8-36. Patient discharged at his request, his condition being as follows:—Spleen, lower margin at the level of the umbilicus. Liver—2 fingers breadth below costal margin. Oedema of feet persisting. Lymphatic glands practically in the same condition. Marked pallor of the face with emaciation present.

Heart dilated, its left border 1" to the left of the nipple line; cardiac impulse diffuse and a well marked haemic murmur present. Venous pulsation prominent in the neck. Sub-conjunctival haemorrhage persisting.

Total count of leucocytes: 83,100 per c.m.m. Haemoglobin:—30%

Relative count was not made, but the following points could be made out from an examination of the blood smear:—Increase in the number of nucleated R. B. Cs. especially megaloblasts. An appreciable number of megalocytes present. Anisocytosis noticed. A few Mast cells present.

Remarks (1) It is evident that the disease grew from bad to worse in the course of 43 days during which the patient stayed in the hospital.

(2) Calcium given intravenously together with Haemoplastin arrested the bleeding from the rectum which was very alarming and which might have proved fatal. The administration of calcium lactate by mouth which was kept up throughout might have prevented a recurrence of the severe bleeding which occur.

red in the beginning. But petechial haemorrhages and slight bleeding from gums at intervals persisted.

(3) The small doses of arsenical preparations given did not produce any effect on the condition of the blood or the spleen. In fact both these were worse than before. The liver was slightly smaller, heart became dilated and oedema developed, evidently owing to cardiac weakness.

(4) No drug is said to be useful in this condition. X-Ray therapy which is known to be valuable in

spleno-medullary leukaemia is said to be positively harmful by some authorities. But an observer in the Latest Medical Annual is of opinion that this treatment is really beneficial. We had no opportunity to try the effects of X-Ray Therapy in this case nor could we try blood transfusion which could have been of use.

(5) Acute lymphatic leukaemia of a haemorrhagic type is a rare disease, which could only be diagnosed by microscopical examination. We think that we have some justification in recording this case.

Reports of Clinical Meetings of the Madras Medical Association.

SECTION OF MEDICINE

Chairman: P. VENKATAGIRI, M.D.

(14th August 1936).

4. Aneurysm of the ascending aorta involving the sinus of valsalva.—S. K. SUNDARAM, B.A., M.D.

S., an Anglo-Indian male, aged about 50 years, has been under frequent observation from 1932. Till January 1936 his was a case of uncomplicated aortic aneurysm, especially of the ascending arch. He was screened in May 1935 and several views of the aneurysm were taken as well. Unfortunately the radiographs could not be traced.

In January 1936 it was noticed that there was a secondary aneurysmal dilatation at the very commencement of the aorta. It was thought then that the aneurysm had begun to involve one of the sinuses of valsalva.

In June 1936 the patient was screened again and several radiographs were taken again. Reprints of two of these are here reproduced by courtesy of the Medical Superintendent of the Barnard Institute of Radiology. These reproductions are, it is presumed, sufficient warrant for an antemortem diagnosis of aneurysm of the sinus of valsalva. A careful examination of the other views, supplemented by a critical

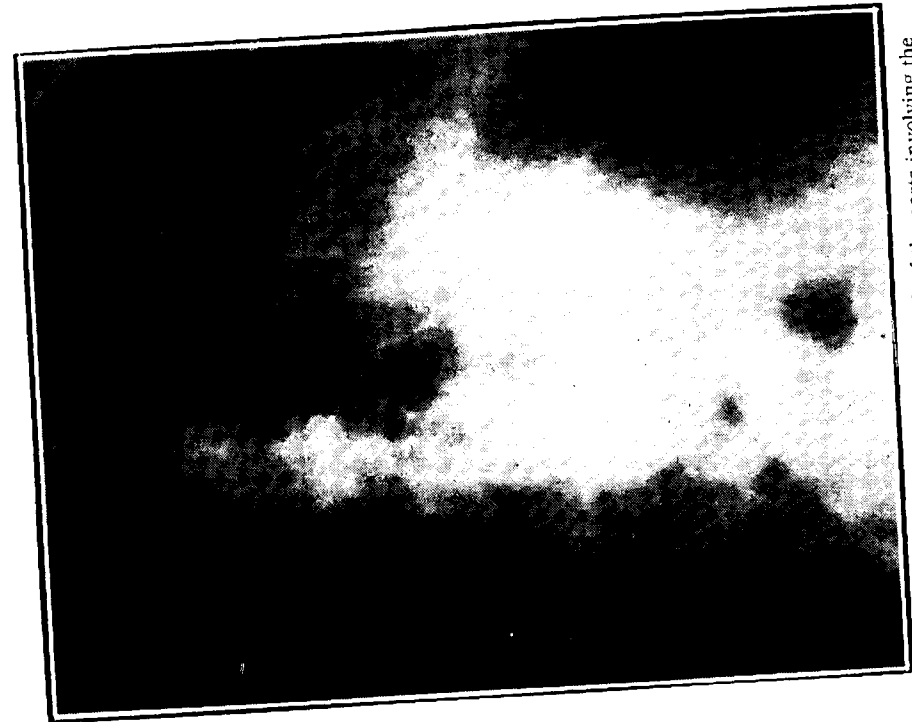
screen examination, was enough to exclude the right or the left auricle as the seat of the secondary aneurysmal enlargement.

Diagnosis of aneurysm of the sinus of valsalva has presumably never been made during life on the strength of clinical signs. Dr. S. K. Sundaram had seen in Vizagapatam a case which seemed to satisfy the possible criteria for such a diagnosis. The case was however not so clear cut as the present one.

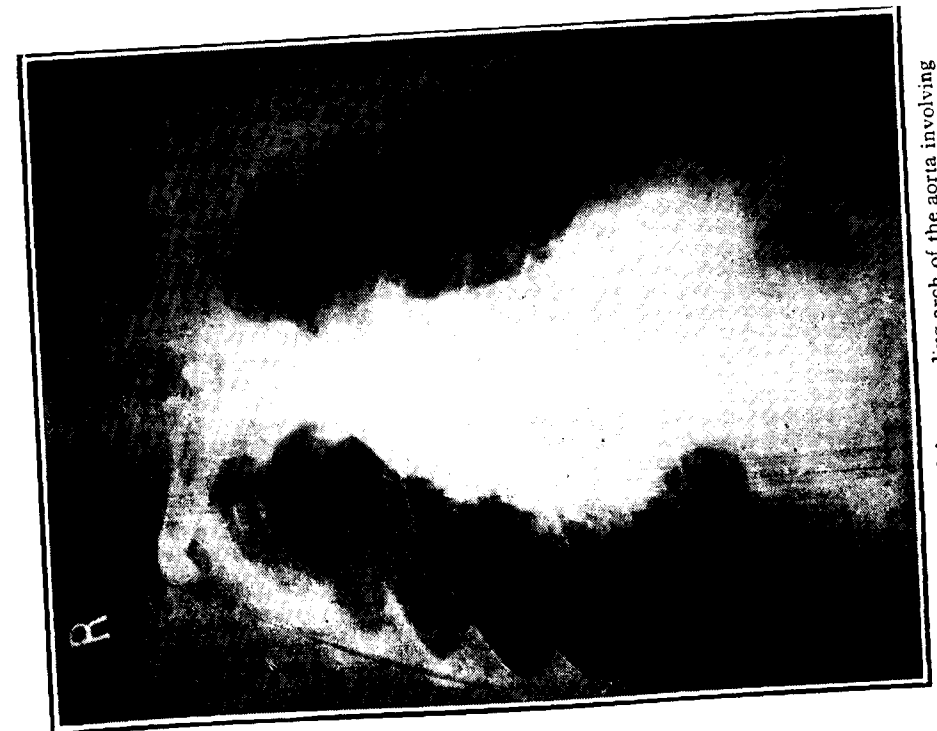
The patient had every time been seeking admission for chest pain. The pain had on some occasions been severe enough to require morphia. With rest and large doses of iodides the pain was relieved. The result had always been that the patient insisted on a discharge. Patient has in fact stayed in hospital just for a week in September 1936.

His Kahn and Wassermann reactions (Blood) have been strongly positive. He has never let himself be given a thorough antisyphilitic treatment, other than iodides and mercury during the short spells of his hospital stay.

The physical signs have always corresponded to the radiological



S: Aneurysm of the ascending arch of the aorta involving the sinus of Valsalva: oblique view showing the origin of the secondary aneurysm.
(Dr. S. K. Sundaram's Case)



S: Aneurysm of the ascending arch of the aorta involving the sinus of Valsalva: A. P. view.
(Dr. S. K. Sundaram's Case)

findings. There has been no striking growth in the dimensions of the aneurysm that one would expect in such a case in an individual who has been up and about. The site of the maximum impulse and most audible to-and-fro murmur has been about an inch internal to the right nipple corresponding to the secondary aneurysmal dilatation. There has been no evidence of erosion of bone.

There are no appreciable signs of disease elsewhere. In June 1936 there were signs of deficient air entry over the right lower lobe, probably due to pressure of the aneurysmal enlargement on the right hyparterial bronchus. The blood pressure has on this occasion been noted as 130/65 and 125/65 mm. of mercury in the right and left arm respectively. There has at no time been any electrocardiographic evidence of myocardial damage.

The patient has always been the picture of perfect health, except when he is in pain. He was once seen walking along quite brisk and erect; to all appearances he was quite fit.

5. Myeloid Leukaemia and its response to radium.—S. K. SUNDARAM, B.A., M.D.

Pakkiri, a Hindu male of about 30 years of age, was admitted under Dr. M. R. Guruswami Mudaliar in the General Hospital, Madras, on the 3rd June 1936 with a complaint referring to a big mass on the left side of the abdomen. This mass was splenic in origin and had come down to above 3" above symphysis pubis. The liver was two finger breadth below the costal margin in the right nipple line. Blood exami-

nation straightaway gave the picture of myeloid leukaemia.

On 5th June 1936, the white cell-count was 534,400 per c. mm., of which 5% were myeloblasts, 79% myelocytes, 5% metamyelocytes, 8% polymorphonuclears, 4% basophiles and 1% lymphocytes. The red cells were 2.44 million per c. mm. and the haemoglobin percentage (Zeiss: 100% = 16g) was 47.

Between 15th June 1936 and 27th June 1936 the patient had a 40 mg. pad of radium applied intermittently over the spleen for a period of 210½ hours altogether, working out to an exposure of 8,420 mg. hours of radium. The first 116½ hours of this period were one of continuous exposure.

On 15th June 1936 the white cells numbered 637,500 per c. mm. and on 27th June 1936 they totalled 256,000. On 26th June 1936 the spleen was 1½" below and ½" to the right of the umbilicus. There was a progressive fall of the leucocyte count till on 16th July 1936 they were 103,100 of which the myeloblasts were 1%, myelocytes 17%, metamyelocytes 10%, neutrophilic polymorphs 47%, eosinophiles 6%, basophiles 17% and lymphocytes 2%; and on 8th August 1936 they were 26,600 of which the differential count was 1%, 9%, 3%, 3%, 34%, 36%, 36%, 12% and 5% respectively. The spleen measured ½" above and 4½" to the left of the umbilicus.

The patient was all the while on 90 grains daily of iron and ammonium citrate. From 3rd July 1936 he had a course of "arsenic progressive:" one minim of liquor arsenicalis three times daily, increas-

ed by one minim per dose per day, going up to eighteen minims three times a day, and coming down gradually, till it was cut off. The effect on haemopoiesis was not striking: on 16th August 1936 the red cells numbered 2.87 million per c mm. (an increase of only 0.39 million over its count on 5th June 1936) and the haemoglobin was 66% (an increase of 19% over its reading on 5th June 1936). Davidson stresses the prognostic value of a haemopoietic response to a successful radiation of the spleen in leukaemia.

The prolonged radium exposure caused marked pigmentation and very slight peeling off of the skin.

(Subsequent to the demonstration of the case at the meeting, the white cells began to increase and the spleen began to grow again. The patient refused to have the spleen removed and was therefore given deep X-ray therapy over the long bones. The white cell count still rose to 185,000 on 1st September 1936, of which the myeloblasts were nil, myelocytes 28%, meta-myelocytes 28%, neutrophilic polymorphs 40%, eosinophiles 10%, basophiles 12% and lymphocytes 2%.

There have since been several other cases of equally good or better response to radium treatment of leukaemia in the General Hospital. It is hoped to collect them and publish the results later on.

The patient went home on 11th September 1936, promising to come again).

All the blood counts of this case were done by the clinical pathologist of the General Hospital, Madras.

6. Arteriosclerotic Aortic Aneurysm.—S. K. SUNDARAM, B. A., M. D.

Munian, a Hindu male, aged 56 years, was admitted in Dr. M. R. Gurnswami Mahalier's wards in the General Hospital, Madras, on the 12th August 1936, with a complaint of breathlessness, chest pain and cough specially on lying down, all of a month's duration. Patient had dysentery two years back, for which he got seven subcutaneous injections. His last attack of dyspnoea was four years ago.

Patient was admitted as an in-patient primarily to investigate into the fullness below and above the left clavicle, visible pulsation in the suprasternal notch and underneath the sternal origin of the right sternocleidomastoideus and tortuous veins over the neck, upper chest and arm on the left side. The apex beat was in the sixth left intercostal space one inch outside the nipple. The first apical sound was feeble and the second aortic markedly accentuated. Liver was not palpable. There was nothing abnormal in the lungs. Blood pressure was 150/117 mm. of mercury. Serum Kahn reaction was negative.

Patient was screened and radiographs of his chest were taken on the 13th instant. He showed an enlarged heart and a dense dilated dynamic aorta. Reprints of the radiographs of two views, for which thanks are due to the Medical Superintendent of the Barnard Institute of Radiology, are here reproduced and testify to the dimensions of the heart and aorta.

Electrocardiograph demonstrated a bundle branch block.



A. P. view of Munian's chest: Arteriosclerotic aortic aneurysm.
(Dr. S. K. Sundaram's Case)



Munian: Arteriosclerotic aortic aneurysm: oblique view
bringing out the dense dilated aorta.
(Dr. S. K. Sundaram's Case)

(Patient absconded on the 16th August 1936).

7. Chronic generalised Osteitis of undetermined origin.—S. K. SUNDARAM, B. A., M. D.

Venkatappa, a Hindu male, aged 40 years, was admitted in Dr. M. R. Guruswami Mudaliar's wards in the General Hospital, Madras, on the 7th June 1936. His complaint was pain in the hips radiating down to the lower limbs and up towards the chest of one year's duration. The pain was more or less constant.

There was nothing striking on physical examination except rigidity of the low back. Patient had however an enlarged spleen, palpable four inches below costal margin, hard and hot tender. The liver was just palpable, not tender.

A radiograph was taken in the first instance of the lumbar spine. A reprint of it is here reproduced by courtesy of the Medical Superintendent of the Barnard Institute of Radiology. It revealed increased density associated with absence of normal trabeculation. In places calcification of the ligaments and osteophytic outgrowths were seen.

The entire skeleton was then X-rayed and showed a similiar appearance. The tubular bones showed irregular thickening of the cortex, obliteration in certain parts of the medullary cavities and narrowing by hyperostosis in other parts. The diploe of the skull bones was markedly reduced and the calvarium was thickened and denser than normal. Many of the arteries were calcified and were brought about in the radiographs.

The first thing that was thought of on seeing the radiograph of the

lumbar spine was a carcinomatous infiltration, especially as there was recently a diffuse carcinomatosis of the bones in the hospital secondary to carcinoma of the prostate. The prostate was in this case examined by Mr. Mangesh Rao. He found the left lobe slightly enlarged, but there was no suggestion of cancer. There was no obvious involvement of the thyroid or breast. The kidneys were not at the time explored, though this was thought of, because of the suggestions regarding a syphilitic origin made by the picture of the entire skeleton, especially the skull and long bones.

Blood Kahn was positive and Wassermann reaction strongly positive. Patient was put on antisyphilitic treatment, consisting of a prolonged course of iodides by mouth, supplemented by sodium iodide by injection, 10 bi-weekly intramuscular injections of Crooke's collosol mercury sulphide, 2 c.c. each, and 2.4 grams of neoarsphenamine and 1 c.c. of bismostab. The injections had to be stopped on 8.8.36 because of albuminuria. A radiograph taken on the 31st July showed no change in the condition of the spine.

Complete haematological and necessary biochemical investigations were done to exclude bone marrow involvement and parathyroid excess. A cisterna puncture was also done and fluid drawn was sent for examination. The laboratory reports are given below. The blood counts were all done by the clinical pathologist of the General Hospital, Madras, the biochemical investigations in the department of biochemistry in the Madras Medical College.

			Done subsequently	
	10-6-36	16-7-36	3-9-36	14-9-36
Serum calcium in mg. %	11.5	10.4	8.6	...
Serum phosphates in units in mg. %	3.5	3.5	3.0	...
Plasma phosphatase in units per c.c.	..	...	0.66	0.055
Total serum proteins in /	6.4	...	6.7	...
Blood cholesterol in mg. %	...	121.2	118.0	...
Blood urea in mg. %	24.0 (15/6)			41.0
Urine urea (volume in one hour % 59 c.c.) in mg. %	...	...	...	611.0
Urea clearance (standard) of average normal,		...	...	27.6
Blood van den Bergh (15-6-36) negative ...		...	...	...
	12-6-36		12-9-36	
Red cells in millions per c. mm.	2.76		2.11	
Haemoglobin % (Zeiss : 100% = 16 g.)	52		44	
Eve's halometric reading in microns	7.48		7.17	
White cells in thousands per c. mm.	31		25	
of which there were neutrophils	58 %		52 %	
eosinophiles	11 %		4 %	
basophiles	2 %		0 %	
lymphocytes	24 %		39 %	
mononocytes	5 %		5 %	
Reticulocytes per cent	1.8		...	
Report on blood film	No immature white cells; only one normo- blast seen in two films.		Hypochromic anaemia, with aniso- cytosis and pokilo- cytosis; no nucle- ated reds.	
Cerebro spinal fluid tests (18-6-36) :	clear, by cisternal puncture :			
Albumin	20 mg. %			
Globulin	nil			
Urea	20 mg. %			
Calcium	5.6 mg. %			
Cells per c. mm.	2			
Wassermann reaction	negative			
Colloidal gold curve	0011220000.			

There were no changes in the urine. The urine was free from Bence Jones protein too. There were no ova in stools.

(In view of absence of any improvement on antisyphilitic treatment and in view of negative findings in other directions as well,

the patient was subsequent to the demonstration at the meeting, given an intravenous injection of uroselectan-B. Radiographs after the injection failed to bring out any of the medium but for a speck of it in the left kidney. There was nothing in the bladder too. Per-abrodil was injected a few days later. Even

that was not excreted by the kidney. The significance of these negative findings is not clear, especially in regard to the question of a primary growth in the kidneys.

The patient is still in hospital, as this report is being made (4-10-36). The etiology of the bone involvement still remains open.)

8. Rheumatic Chorea :—D. GOVINDA REDDY, M.D.

The patient was an Anglo-Indian girl aged about 13 years attending school. There was definite history of rheumatic fever, and a systolic murmur over the mitral area at the time of admission. Pyrexial therapy was tried with success. She had three injections of T.A.B. Vaccine (vaccine used for prophylactic purposes) intravenously. First, half a c. c. was given, and the latter two injections were 1 c. c. each. Every time the injection was given, there was a rise of temperature. After the first injection, the child became temporarily worse, but soon showed signs of improvement. At the time of discharging, she was a—febrile and quite normal.

The pathology of the disease was discussed in brief, and the use of Nirvanol was considered. In this connection, the speaker pointed out, that there was no truth in the view held by some of the Western writers that true rheumatic chorea is absent in the Tropics.

9. Symptomless Aneurysm of arch of the aorta with nephritic hypertension :—D. GOVINDA REDDY, M.D.

The patient was a young man of 20 years, who complained of breathless-

ness on heavy exertion, and generalised vague pains all over the body. The superficial veins of the neck on the left side were slightly distended and there was a definite area of dullness to the left of the sternum in the 2nd and 3rd intercostal spaces. In the history of previous illnesses, the only incidence of importance was an attack of general anasarca a few years back. The patient denied any history of exposure to venereal infection, nor was there any stigma to show a congenital infection.

The important clinical and laboratory findings were (1) Marked hypertrophy of the left ventricle with a blood pressure of 240/135 m.m. of Hg. (2) Urine contained a trace of albumin, with plenty of granular casts. (3) Blood urea was 118 m.g. per cent. and cholesterol 200 m.g. per cent. The creatinine content was 2.3 m.g. per cent. (4) Urea clearance test was as low as 6.5 per cent. (5) The Wasserman reaction of the blood was negative even after a provocative injection with arsephenamine. (6) The sight was poor and both the eyes showed lamellar cataracts.

He had a slow, high tension pulse and the electro cardiogram showed marked "left ventricular preponderance" (old terminology). A systolic murmur was heard both in aortic and pulmonary area. The murmur was conducted along the right carotid artery. Screening revealed a dynamic aneurysmal dilatation of the arch of aorta, of the size of an orange.

The high blood pressure was evidently due to chronic glomerulo-nephritis. The signs of restlessness might have been due to uraemia.

There was no known cause for the formation of the aneurysm. Syphilis, trauma, and infection (subacute bacterial endocarditis), the more important causes of aneurysm were eliminated. Hypertension, either primary or secondary, as a cause of aneurysm is not approved of by any pathologist. The speaker wanted to know, whether there were any reported cases similar to this. The possibility of these two conditions being independent has also to be borne in mind.

10. Fibrosis of right lung with pseudo-dextro-cardia :—D. GOVINDA REDDY, M.D.

The case was presented merely to avoid the pitfall of too ready a diagnosis of true dextro-cardia.

11. Aneurysm of the arch of the aorta.—K. N. PISHAROTI, M.B.B.S., M.R.C.P., D.T.M.

The patient was an Anglo-Indian male aged 28 years. He was admitted under Major G. R. McRobert, I. M. S., on 31-3-36, and was subsequently under the care of Mr. V. C. Govinda Menon.

Patient complained of pain over the chest since October 1935. He had a pulsatile tumour over the upper part of front of the chest, mainly on the left side, extending up to the suprasternal notch and clavicle above, the level of the 4th rib below, and from a fingerbreadth internal to the left midclavicular line to a fingerbreadth to the right of the right lateral sternal line. The tumour was of the size of a big orange. There was expansile pulsation, no thrill. A soft systolic murmur was heard over the tumour as well as

over the whole of the chest. The radial pulse was unequal, being less marked on the left side. A clinical photograph taken by Mr. Pisharoti is here reproduced. Blood pressure was 124/60 on the right side and 114/60 on the left.

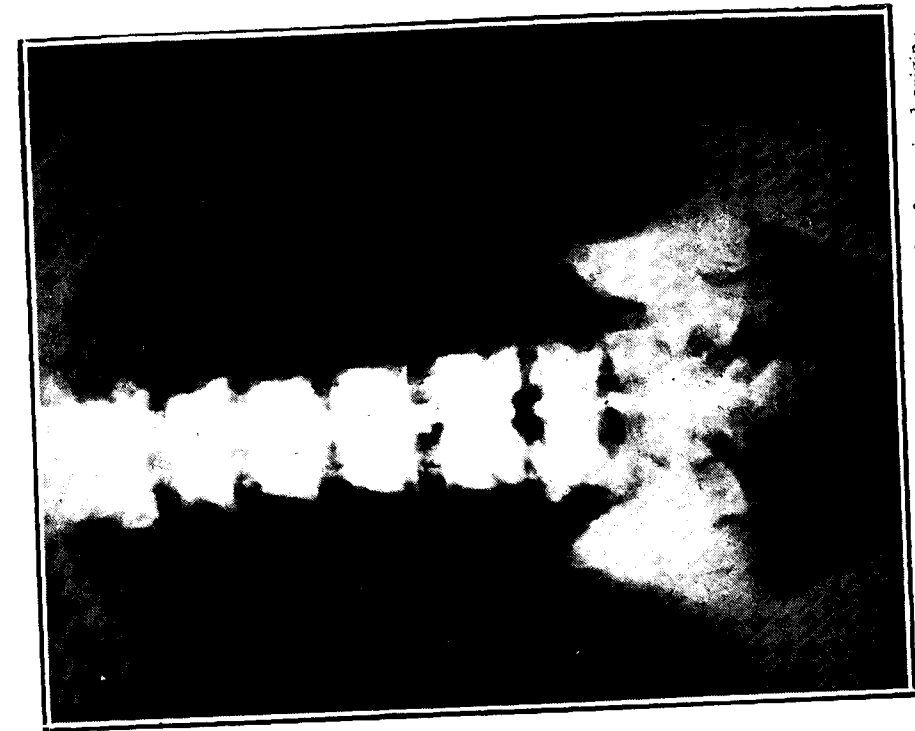
The pain was over the whole of front of the chest, the left side of the back, and over the inner aspect of the left arm up to the middle of the forearm. It was constant, but worse in the afternoons. He was having sleeplessness on account of the pain.

Patient had dyspnoea at intervals, the attacks lasting for about half an hour. There was no dysphagia, cough or alteration of voice. Pupils showed no abnormality. He was at times spitting out fair quantities of blood.

There was no history of syphilis, but Wassermann reaction of blood was positive. The diagnosis of aneurysm was confirmed by radiological examination.

Patient was put on large doses of potassium iodide and he had repeated injections of morphia or omnopon for the pain and sleeplessness. He was also being given injections of collosol mercury sulphide 2 c.c. twice weekly.

For some weeks after admission the tumour was found to be rapidly getting bigger, and an untoward result was expected any moment. But gradually the condition began to improve. The tumour is now much smaller, of less than a small lime in size, there is no pain on the left side, but he complains of some pain over the right side of the



Venkatapa : Chronic generalised osteitis of undetermined origin :
A. P. view of lumbo-sacro-iliac region.
(Dr. S. K. Sundaram's Case)



(Dr. K. N. Pisharoti's Case) Aneurysm of the arch of the aorta.

chest and inner aspect of the right arm. The dyspnoea is much less. Occasionally he has some pain and difficulty in swallowing. The patient feels much better, and his general condition has improved a good deal.

Discussion arose as to the cause of this improvement. It was suggested that the improvement might be due to the deposition of laminated clots inside consequent on prolonged rest and depression of circulation due to repeated injections of morphia and omnopon and also to absorption of granular material from the wall of the aneurysm due to large doses of iodides.

12. Aneurysm of the innominate artery.—K. N. PISHAROTI, M.B.B.S., M.R.C.P., D.T.M.

The patient was a Hindu male aged 32, admitted on 27-7-36 under Dr. V. C. Govinda Menon, for a swelling in the neck, of two months' duration. It extended up to $\frac{3}{4}$ " above the right clavicle, and from the middle line of the neck to the posterior border of the right sternomastoid. There was dullness over the manubrium sterni and over an area extending to the right mid-clavicular line on the right and the 2nd right costal cartilage below. The tumour showed expansile pulsation, a systolic thrill and a systolic murmur. The pulse was less marked on the right side.

Patient complained of pain over the swelling, he had difficulty in breathing and swallowing, he had cough with scanty expectoration, and his voice was hoarse.

There was clubbing of the fingers on the right side.

Kahn reaction was positive.

Radiological examination confirmed the diagnosis.

Patient was put on large doses of potassium iodide and had in addition a course of ten injections of colossal mercury sulphide—2 c. c. intramuscularly twice a week. The symptoms abated very much, and the patient was discharged much relieved.

Discussion arose as to the advisability of giving organic preparations of arsenic intravenously in such cases. The administration of colossal mercury sulphide appeared to do good.

12. Huge Aneurysm of the innominate artery.—K. N. PISHAROTI, M.B.B.S., M.R.C.P., D.T.M.

This refers to a case that was under Dr. V. C. Govinda Menon in the General Hospital, Madras. The interest of the case was the enormity of the dimensions of the swelling. It will be reported in detail in a subsequent issue.

14. Generalised Aneurysmal Dilatation of the whole of the thoracic aorta.—T.K. SUNDARAM, M.B.B.S.

A day of aneurysms was fittingly concluded with demonstration of a skiagram of a diffuse aneurysmal dilatation of the whole length of the thoracic aorta.

SECTION OF SURGERY

Chairman:

B. SANJEEVA RAO, L.M. & S.

(September 26, 1936)

1. Aneurysm of the abdominal and thoracic aorta—D. SUBRAHMANYAM, M.B.B.S.

2. A case of total gastrectomy—D. SUBRAHMANYAM, M.B.B.S.

Special interest was shown in this case as the first successful total gastrectomy done in the General Hospital, Madras. Credit for it goes to Lt.-Col. K. G. Pandalai, I. M. S.

3. A case of inferior vena caval obstruction—D. SUBRAHMANYAM, M.B.B.S.

This was a very interesting case and elicited considerable discussion. The patient had a bad fall five years ago. He developed swelling in both legs and tortuosity of the veins of both lower extremities and abdominal wall and slightly of the upper part of the chest and neck. There was no bleeding per rectum at any time and no haematemesis. Patient showed a compression fracture of the eleventh dorsal vertebra.

It was suggested in the course of discussion that there must have been injury to the endothelial lining of the inferior vena cava at the level of the 11th dorsal vertebra and that as a result patient should have developed thrombosis of the inferior vena cava. As the site of the thrombosis was below the junction of the hepatic veins, portal circulation was intact.

It was suggested in the course of discussion that sodium iodide injection into the femoral vein might bring out the obstruction. An alternate method would be to measure the time taken for the taste of the drug to be felt after injection into the femoral vein and compare it with the normal rate.

4. Fungus infection of the skull, actinomycosis, aspergilliosis. E. A. SHANKER, M.B.B.S., on behalf of MD. ISMAIL, M.B.B.S.

Narayanappa, a Hindu male of 25 years of age was admitted into Lt. Col. Cruickshank's wards in the General Hospital, Madras, on 7-7-36 with a complaint of a painful swelling on the left half of his skull and face of two years' duration.

The swelling dated from an injury 15 years ago, but had been growing and painful only for the last two years. The swelling, at the meeting involved the whole of the left side of the head and upper part of the face, caused protrusion of the eyeball, marked chemosis of the conjunctiva and impaired mobility of the jaw. The swelling was uniformly hard and tender. It had not interfered with sight. Hearing on the left side was however defective.

The lymph nodes in the left posterior triangle were enlarged and slightly hard.

Blood chemistry, especially in regard to calcium and lipid content, was normal. Blood picture as normal. Urine showed nil abnormal and was free from Bence Jones protein.

Radiographs showed thickening of both tables of the skull with absence of diploe on the affected side.

The pathologist reported "actinomycosis" on histological examination of the soft tissues from the affected region. The bacteriologist however grew an aspergillus. There was no primary focus anywhere.

Intensive radium and deep X-ray therapy did not give any benefit.

5 Hydronephrosis. E. A. SHANKER, M.B.B.S., for MD. ISMAIL, M.B.B.S.

Narayanaswami, a Hindu male, aged 30 years, was admitted in Col. Cruickshank's wards in the General Hospital, Madras, on 18-9-36 with a swelling on the left side of the abdomen of a month's duration.

Abdominal pain started three years back. Patient had had three attacks; they were described as pain in the midline of the abdomen settling down to the left loin, aggravated by food, lasting for two or three days, and accompanied by no urinary disturbances. The last attack was slightly pyrexial.

General condition of the patient was good but for some anaemia.

The swelling filled the left loin and crossed over the middle line, was immobile, cystic, encroached on splenic area and up to the left fifth intercostal space to percussion. A notch was felt along the right border of the tumour and there was a suggestion of a transverse band of resonance across its front. There was fluid thrill. The overlying skin was not warm. There was anaesthesia over the distribution of the left lateral cutaneous nerve of the thigh. Patient had hydrocele on the right side.

Blood picture showed no primitive red or white cells, which totalled 3.12 millions and 13,300 per c.mm. respectively. There were no malarial parasites. There was occult blood in the urine, but nothing else abnormal.

Radiographs taken after uroselectan-B showed a normally functioning right kidney, but the left kidney did not secrete any of the medium. There was however a suggestion of a stone on the right side. Its position is now meant to be made sure of by cholecystography (and possibly by retrograde pyelography) before laparotomy.

6. Sarcoma E. A. SHANKER, M.B.B.S. for MD. ISMAIL M.B.B.S.

Velangiri, an Indian Christian male, aged 35 years, was admitted in Col. Cruickshank's wards in the General Hospital, Madras, with a swelling on the back of his neck of two months' duration.

The swelling started as two small growths situated on either side of the middle line of lower part of the neck behind, and gradually, by coalescence, grew to a fixed, warm, moderately hard and tender swelling of uniform consistency, its present dimensions; occupying the whole of the back of the neck, extending from the external occipital protuberance above to the vertebral prominence below and the anterior borders of the upper trapezii on either side. Patient had pricking pain over the tumour. Neck movements were limited all round. There was no subjective or objective evidence of encroachment on the pharynx and oesophagus.

General condition was satisfactory. Patient was afebrile.

Skiagram showed absorption of the tips of the spines of the 5th and 6th cervical vertebrae.

About 15 c.c. of clear, yellow fluid was aspirated from the tumour.

followed by blood. The whole coagulated spontaneously. The pathologist made it into a block and found no malignant cells on section.

Cerebro spinal fluid obtained on lumbar puncture was normal.

7. **Angioma.** E. A. SHANKER, M.B.B.S., on behalf of MD. ISMAIL M.B.B.S.

Radha, a Hindu girl of 8 years of age, was admitted in Col Cruickshank's wards in the General Hospital, Madras, with a large painless pigmented tumour over the left side of neck and shoulder.

The tumour started as a birth mole, gradually increased in size and at the time of the demonstration present formed two large lobulated masses, extending from the pinna of the left ear above to the deltoid below and over the infraclavicular region in front and the upper back behind. The growth was sharply demarcated by the middle line of the body both in front and behind.

The tumour was distinctly lobulated, hard at places, fluctuating at others, moveable over underlying structures not adherent to the overlying skin, and corresponded to the cutaneous distribution of the 3rd and 4th cervical nerves on the left side. There was growth of brown hair over the tumour.

The tumour had encroached on the larynx, causing obstruction to breathing. General condition was satisfactory.

Massive doses of radium had resulted in relief and softening of the tumour.

It was suggested in discussion that the growth was a neurofibroma of elephantoid type.

8. Mr. N. Mangesh Rao showed a number of interesting radiological studies of stones in the urinary tract and of a case of gallstone simulating ureteral stone and of a case of calcified mesenteric glands simulating renal calculus.

9. **A case of congenital macroglossia** operated on by Mr. Mangesh Rao was also shown. Its interest lay in its long duration and therefore difficulty of closure of the mouth even after removal of the superfluous portion of the tongue. A wedge shaped section of the angle of the jaw on either side had to be removed before the mouth could be closed.

10. **A clinical photograph of a case of huge bilateral inguinal hernia** successfully operated on by Mr. Mangesh Rao was also shown.

11. **Clinical photographs of a huge elephantoid leg** in a woman before and after Kondelion's operation done by Mr. Mangesh Rao were also shown.

It only remains to acknowledge with thanks permission given by the Superintendent of the General Hospital, Madras, and the respective physicians and surgeons of the hospital to present the cases and to publish notes of them.

S. K. S.

Gleanings from Current Literature

PHYSIOLOGY.

Hormonic Control of Carbohydrate Metabolism. G. H. TUTTLE, (*Med. Record*, Feb. 5, 1936, p. 92) propounds a hypothesis regarding the relation of the metabolic hormone of the anterior portion of the pituitary body and carbohydrate metabolism. He suggests that the pituitary hormone acts as a perfect balance wheel for the carbohydrate metabolism controlling the rise and fall of the blood sugar and being in turn controlled by it. Lucke showed that a fall in the blood sugar content resulted in a discharge of adrenaline by splanchnic nerve stimulation originated by passage of the hormone into the spinal fluid. This adrenaline then mobilizes the glycogen supplies in the liver and elsewhere so as to restore equilibrium. When the blood sugar rises it releases the breaks on cellular insulin production, as Houssay showed, providing more insulin to deal with excess of blood sugar. Tuttle argues that when the chronic hyperglycaemia of the diabetic state supervenes, this perfect regulatory action is interfered with or abolished. The pancreatic insulin acts independently of this mechanism producing insulin only at meal times in response to the humoral stimulation of the duodenal hormones and the neurogenic impulses conveyed through the vagus to the pancreas (La Barre) when the blood sugar exceeds normal limits. Its only function is to make possible the migration of the sugar from the

blood stream to the cells, and takes no direct part in the oxidation of glucose or the formation of glycogen. A deficiency of pancreatic insulin may be caused by any derangement which interrupts the neurogenic impulses from the parasympathetic centre in the brain through the vagus nerve to the pancreas or by any decrease in the amount of hydrochloric acid secreted by the stomach, since this prevents the formation of the duodenal hormones which are the natural agents causing the discharge of insulin into the blood. A lack of alkaline phosphates in the blood stream preventing the formation of the hexose phosphates even without a deficiency of insulin, might be the cause of this original hyperglycaemia, which would then act upon the pituitary mechanism as indicated.

PHARMACOLOGY.

Ergometrine, (*B. M. J.*, Aug. 1, 1936, p. 243).—At the annual meeting of the British Medical Association at Oxford Mr. J. Chassar Moir read a paper on clinical experiences with ergometrine.

In 1932 he had called attention to the fact that the clinical action of ergot on the uterus was not mainly due to ergotamine or ergotoxine, but that some unknown alkaloid must also be present. In 1935 this alkaloid was isolated and given the name of ergometrine. Ergometrine had a much smaller molecule than

the other ergot alkaloids, was highly active, causing powerful contractions of the puerperal uterus without the other unpleasant effects; there was no risk of peripheral gangrene, which might result from prolonged use of ergotamine. In the case of the post-partum uterus, ergometrine did not cause a continuous spasm but a series of repeated single contractions so that complete relaxation did not occur in the early stages after its administration. The action was prolonged lasting three or four hours at least after which there was no contra-indication to a second dose if necessary.

The chief indications for its use was the prevention and treatment of post-partum haemorrhage and where rapid action was required it could safely be given intravenously. The points in its favour were that it was less erratic than pituitrin, and the danger of shock was eliminated. Other suggested uses were in Caesarian section, incomplete abortion, and certain cases of menorrhagia, though in such conditions it did not appear to be superior to pituitrin. The drug was entirely unsuitable for use during labour itself as it had a variable action on the uterine contractions and foetal death often ensued. He suggested that the time had come for the investigation of the action of ergometrine in the treatment of migraine and exophthalmic goitre, and concluded that whenever there were indications for ergot the new drug should be used as it was for more efficient.

Vinyl Ether. V. GOLDMAN, (*B. M. J.*, July 18, 1936).—Vinyl Ether or divinyl oxide is $\text{CH}_2 : \text{CH} . \text{O} . \text{CH} : \text{CH}_2$ and is a colourless liquid

with a characteristic odour and with a boiling point of 28.31°C and specific gravity of 0.77. It rapidly decomposes and consequently has added to it 3.5 per cent of alcohol and 0.01 per cent of non-volatile oxidation inhibitor (phenyl naphthylamine). It is highly inflammable.

Vinyl Ether is an inhalation anaesthetic and probably derives its anaesthetic action from its lipid soluble property, being more potent than chloroform. An overdose produces respiratory paralysis, but it does not appear to have any effect on the cardiovascular system in the small doses used in this method of administration. It is non-irritant to the lungs, but produces an increased flow of saliva.

Spontaneous recovery following respiratory paralysis induced by an overdose of vinyl ether in rats occurred in 100 per cent of cases when the anaesthetic was immediately withdrawn.

Vinyl ether is rapidly eliminated unchanged by way of the lungs with almost the same rapidity as nitrous oxide.

No undesirable after effects have been noticed. In a series of cases not a single patient has vomited or has been detained on account of any post-anaesthetic complication.

Vinyl ether is obtainable under the trade name of *Vinesthene*, in bottles of 25 and 75 c.m. and also in ampoules of 3 c.c.

MEDICINE.

A Trephine modified to secure Bone Marrow (Sternal) Biopsies. E. L. TUOHY, M.D., and M. G. GILLESPIE, M.D., (*J. A. M. A.*,

Gleanings from Current Literature

April 20, 1935). The trephine here devised and illustrated (illustrations omitted) as to its parts is modified from the various puncture needles (Ghedini, Arinkin, Seyfarth and others), long suggested to get marrow specimens safely both for histologic embedding and for smears for routine staining. The sternum is ideally adapted as a source, both because of ease of access and because of its persistent functional activity throughout life. The ribs are equally active but not so simple to approach. Isaacs has correctly criticised simple needle puncture methods as really yielding mixtures of marrow and elements "washed out" with traumatically induced blood flow. Thus one has blood with certain marrow admixtures. We have found this true, especially when the marrow system is inactive. Ordinary chronic myeloid leukemia, however, yields needle puncture material so readily that smears so closely resemble ordinary blood smears as to make the observer feel that he has tapped an actual vessel or blood space.

It is obvious that sections of fixed marrow tissue, while useful can never give the desired morphologic detail essential to develop the diagnostic and therapeutic guidance that this pre-eminent hematopoietic source material (erythrocytic, granulocytic and thrombocytic) promises.

This instrument is easy to use. The biopsy is painlessly accomplished under simple procaine hydrochloride anesthesia, and a 0.5 cm. scalpel incision through the skin brings the instrument down to the periosteum. It yields a round marrow segment without either hemorrhage or blood admixture. The tip

of this plug permits the making of from three to five delicate touch smears. Stained either with double strength Giemsa or ordinary Wright's stain, beautiful diagnostic preparations are available. The present super activity in the domain of hematology renders studies of bone marrow in all cases of low leukocyte or platelet counts, with or without purpuric or ulcerative tendencies, as well as all anemias of doubtful origin or classification, a fruitful field for investigation.

Structure of the instrument.—This instrument consists of three parts. The first part is a trephine. This is made of chrome vanadium steel. It measures 5.5 cm. in length and has an inside diameter of 4 mm. and an outside diameter of 5 mm. Thus it is readily seen that the metal is very thin. On the terminal end of the trephine is a series of fine teeth. The proximal end is fitted with a handle-like effect in which the instrument can be grasped and readily turned. On one side of the instrument, beginning at the terminal portion, there is a millimeter scale, which runs up to 3 cm. The proximal lumen will just fit a Luer syringe. The second portion of the instrument consists of a stylet that just fits the inside lumen of the trephine. The terminal end of the stylet has a blunt, faceted (three facets) surface. The third portion consists of a long, screwlike slender nail. Only the terminal end for a distance of about 3 mm. has this screwlike effect.

Technic.—The field of operations is prepared in the usual manner, with the use of iodine and alcohol; a site over the sternum is selected in

the interspace between the second and third ribs. A small fine hypodermic needle being used, first the skin and subcutaneous tissue and then the periosteum are infiltrated well with procaine hydrochloride solution. It is then best to wait for from five or ten minutes; an incision is then made over this site about 1 cm. in length. Dissection is carried down to the sternum in an effort to divide the subcutaneous tissue and tendinous insertions on the anterior aspect of the sternum. The trephine with the stilet inserted is then introduced through the incision and with a boring motion is carried down to the periosteum. The stilet is then withdrawn and the screw is inserted through the trephine and bored into the anterior plate of the sternum until it holds firmly. The trephine is turned slowly and pressure is applied. The trephine will be not only felt but actually heard as it cuts through the anterior plate of the sternum. When the trephine is through the lamella of bone there is a certain give, and a few more turns are taken and the instrument (the trephine and the screw) are withdrawn together. It will be found that the plug of the sternum and the bone marrow will be attached to the screw. The screw is removed, the specimen is gently stroked two or three times over one or two glass slides and the specimen is then placed in 5 per cent formaldehyde solution. Sections for microscopic study may be prepared if desired.

There is very little bleeding, and the wound edges usually fall together or, if not, they can be brought together with adhesive plaster or a skin clip, and a dressing

may be applied. As a rule, there is very little distress during or after this procedure.

Sternal marrow aspirated during life—(cytology in health and disease) RICHARD H. YOUNG, and EDWIN E. OSGOOD. (*Arch. Int. Med.* lv. 2 February 1935, 186.)

Technic.—With the patient lying on his back, with his chest elevated by a pillow beneath his shoulders, the region of the sternomanubrial junction is prepared with iodine and alcohol. Using aseptic technic, the sternomanubrial junction is located as a distinct ridge opposite the sternal cartilages of the second ribs, and the skin, subcutaneous tissues and the periosteum of the region are infiltrated with procaine hydrochloride. Using an 18 gauge spinal puncture needle, from 3 to 4 cm. in length, the sternomanubrial junction is entered in the midline at an angle of about 60 degrees to the surface of the chest. Then the needle is depressed to an angle of about 30 degrees and is forced into the marrow cavity of the body of the sternum, care being taken not to exceed a depth of 1.5 cm. If much resistance is encountered, the needle is rotated, while pressure is maintained to facilitate penetration. The stilet is then removed, and using a 2 c.c. Luer syringe, 1 or 2 cc. of marrow is aspirated. If no marrow appears after strong aspiration, the stilet is replaced, the needle is inserted a little deeper and aspiration is done. We then remove the syringe from the needle and transfer the aspirated material, which looks like blood into a 4 by $\frac{1}{2}$ inch test tube containing from 2 to 4 mg.

of powdered potassium oxalate, shaking well to insure mixing. The stilet is then replaced, the needle is withdrawn and the puncture wound is sealed with collodion.

The oxalated marrow can be used for any type of haematological examination which can be done on oxalated blood.

The Bone Marrow (A Clinical Lecture at Kansas City Session A. M. A.) (R. H. JAFFE, M.D., J. A. M. A. 11th July 1935). The improvement in the technic of biopsies of the bone marrow has added a valuable method to the diagnostic laboratory procedures to which the clinician can resort in the cases in which the examination of the peripheral blood fails to give definite information. The importance of the examination of the bone marrow *in vivo* becomes evident if one considers the fact that the circulating blood does not always reflect the condition of the bone marrow. Great differences exist sometimes between the cellular content of the blood and that of the bone marrow which may be the source of diagnostic errors. Since the biopsy of the bone marrow is expected to become widely used in clinical medicine, I shall present a brief discussion of the normal bone marrow and of the changes that are observed in some of the important disturbances of blood formation.

The Normal Bone Marrow—In early childhood, active, red marrow fills the cavities of all the bones. By the age of 7 years, fat cells start to appear between the cells of blood formation, and with progressing age the active marrow gradually recedes

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from the distal portions of the skeleton toward the trunk. Its place is taken by an adipose tissue that is somewhat different from the adipose tissue in other locations. Thus its iodine number is different and it contains more cholesterol esters than the other fat deposits of the body. In the adult, the active red marrow is confined to the flat and short bones and to the proximal portions of the humerus and femur (Neumann, Hedinger, Askanazy, Piney, Turnbull). In the phalanges of the fingers and of the toes the bone marrow is rich in connective tissue fibres.

The weight of the bone marrow amounts to from 3.4 to 5.9 per cent of the body weight and there are five-ninths of a gram of marrow to one gram of blood. Approximately half of the bone marrow of the adult individual is in an active state (red marrow) while the other half consists of fat tissue (yellow or adipose marrow). The red marrow, therefore, equals in weight the liver. In advanced age or in wasting diseases the fat may disappear from the marrow to become replaced by a semiliquid, gray and translucent material (gelatinous marrow). In dystrophic and malacic diseases of the bone and in chronic inflammation, the bone marrow changes into fibrillar connective tissue (fibrous marrow).

The fat tissue of the bone marrow is in a very labile state. When the demand for new blood cells rises above the normal level, new areas of blood formation are quickly formed and the active marrow expands in a centrifugal direction toward the distal parts of the long bones. The small islands of the red

marrow in the proximal portions of the humerus and femur enlarge and fuse together, and foci of active marrow, which are located about dilated blood capillaries, appear in the midst of the fat tissue. An excessive demand for blood cells may call for a widening of the bone marrow spaces, which is accomplished by the resorption of the bony trabeculae that cross the marrow cavities and eventually also by the resorption of the inner layer of the cortical bone.

Microscopically the red marrow consists of a cellular reticulum the meshes of which are filled with the precursors of the cells of the circulating blood. The cellular reticulum is anchored to the endosteum that covers the inner surfaces of the bone. It forms also the lining of the sinusoidal blood spaces, into which the mature blood cells are discharged and which connect the terminal branches of the arteries with the veins. In addition to the sinusoids, in which the blood is circulating very slowly, there are fine capillaries, which are usually closed to the circulation. I believe that all the cells of the bone marrow are derived from a common parental cell, which breaks loose from the cellular reticulum and drops off into the spaces between the branched and anastomosing reticulum cells. In the case of erythropoiesis the mobilized, undifferentiated cell, which has been called the hemocytoblast, develops into a large cell with a deeply basophilic cytoplasm and a round nucleus that contains a fine and dense chromatin net (the erythrogenia). In succeeding generations the cells decrease in size, the chro-

matin arranges itself in the form of coarse clumps, and the cytoplasm becomes first amphophilic (polychromatic) and later acidophilic (orthochromatic). Approaching maturity the nucleus shrinks to a small deeply stained clump, which is finally expelled, and the cell is ready to start on its trips through the body. Normally the very immature and deeply basophilic forerunners of the red blood cells are scanty, and the bulk of the erythropoietic tissue is composed of the smaller cell forms with the different degrees of hemoglobinization of the cytoplasm (erythroblasts and normoblasts). According to Sabin, Doan and Peabody the red cells ripen in the closed capillaries. The anoxia in these closed capillaries is said to favour the multiplication and maturation of the red cells. When new red cells are needed, the closed capillaries are opened and the mature erythrocytes are discharged into the circulating blood.

The granulated cells are derived from an intermediate, non-granulated and basophilic cell (the myeloblast), which, according to my opinion, is distinctly different from the erythrogenia. Maturation is accomplished by the formation of granules in the cytoplasm, by a decrease of the basophilia of the cytoplasm, and by structural changes of the nucleus which lead to the lobulated nucleus of the mature granulocyte. The granulated cells are endowed with ameboid motility and pass easily through the wall of the sinusoids. The granulopoietic tissue of the normal marrow is made up chiefly of granulated cells with oval, bean- and rod-shaped nuclei and well differentiated granulation (myelo-

cytes and metamyelocytes). The youngest, non-granulated cells (myeloblasts) and the cells with the earliest, deeply basophilic and coarse granulation (promyelocytes) are scanty.

The megakaryocytes, which originate from the same stem cell as the cells of the erythropoietic and granulopoietic series, are attached to the wall of the sinusoids and extend cytoplasmic processes through the wall into the lumen of the sinusoids. These cytoplasmic processes, which are cast off into the blood, form the blood platelets. In addition to the cells described, the normal bone marrow contains lymphocytes, monocytes, plasma cells and a few mast cells. The lymphocytes often form small nodules, which are located in the proximity of arterial capillaries.

In sections of normal bone marrow, granulopoietic tissue equals or slightly exceeds erythropoietic tissue (Schilling Doan and Zervas, Dameshek and others). In smears made from aspirated bone marrow fluid, from 12 to 25 per cent of the nucleated cells belong to the erythropoietic series (Arinkin, Escudero and Varela, Loweinger, Nordenson, Segerdahl, Young and Osgood, Van der Merwe, Weiner and Kaznelson). Of the granulated cells, from 0.6 to 3 per cent belong to the oxyphilic variety. There is approximately one megakaryocyte to 400 bone marrow cells (Nordenson, Custor and Krumphar). The monocytes vary between 2 and 7, the lymphocytes between 5 and 15 per cent.

It is evident that considerable variations exist in the cellular com-

position of the normal bone marrow. In addition to individual factors, age, sex, race, diet and stage of nutrition, the climate and the geographic location play an important role. In high altitudes the erythropoietic tissue will be more active than in the low-lands. Hedinger refers to the significance of endemic goiter.

In the time allotted to me I shall not be able to discuss the formation of the blood cells. It may be mentioned, however, that as an important part of the reticulo-endothelial system the bone marrow shares in all the functions that have been attributed to this system, as, for instance the formation of bile pigment, the production of antibodies and the storage of certain substances which are either foreign to the body or accumulate in the tissue fluids in excessive amounts. Thus in Goucher's disease and in Niemann-Pick's disease, which, as the recent important studies of Thannhauser have shown, is closely related to the former, the storing capacity of the reticulum cells of the bone marrow may be taxed to a degree that the production of the blood cells is diminished. The bone marrow contributes to the blood proteins, especially the fibrinogen, and produces more prothrombin than the spleen and the liver.

The mechanism that regulates the maturation of the blood cells and their discharge into the circulating blood and is responsible for the fairly constant cellular composition of the blood is still poorly understood. The granulated cells enter the blood in a certain rhythm, which shows small hourly accessions and a larger diurnal tide in the afternoon

and at midnight. Chemotaxis and the stimulating effect of degradation products of cells on the homologous cells (Myagow's principle) seem to play an important role. With regard to the erythropoiesis it has been stated that the new formation and mobilization of the erythrocytes is controlled by the oxygen tension of the blood. Hoff, Dockhorn, and Papilian and others suggest a regulation of the activity of the bone marrow through the vegetative nervous system, but Naegeli points out that the nerve fibres of the bone marrow are restricted to the proximity of the blood vessels. The depressing influence of the spleen on the bone marrow has been often discussed and seems to be borne out by experimental studies as well as by clinical observations. The hormones of the thyroid gland stimulate apparently the bone marrow, and Roger suggests that the hormones of the pituitary gland and the gonads may have a similar effect (see also Naegeli). According to Hubble, the hormones of the suprarenal cortex increase the productivity of the erythropoietic and granulopoietic tissue, and the basophilic cells of the anterior lobe of the hypophysis exert a stimulating influence on all the blood forming cells and produce eventually polycythemia vera. This action of the anterior pituitary lobe may be an indirect one through the thyroid and the adrenal. The productivity of the normal bone marrow is tremendous. If one assumes that the average span of life of the erythrocyte is about four weeks, 900 billions of erythrocytes are produced daily by the bone marrow. Finally it may be emphasized that the formation of the blood cells and the passage of the blood cells into the

blood stream are two distinctly separate and independent phenomena.

The Anaemias.—In anaemia the erythropoietic tissue of the bone marrow may be increased (hyperplastic), diminished (hypoplastic) or exhausted (aplastic), or it may present deviations from the normal mode of maturation with the formation of abnormal red cells (dysplasia). In the active stage of pernicious anaemia the dysplasia of the erythropoiesis is the outstanding feature. The red marrow usually replaces most of the fatty marrow, although in some cases a considerable amount of adipose marrow may persist. The erythropoietic tissue greatly exceeds the granulopoietic tissue, and the megakaryocytes are few in number and often degenerated. The erythropoietic tissue contains many very immature, large basophilic cells, which are often found in mitotic division, and it is already in this early stage of differentiation that the hemoglobinization of the cytoplasm begins. Owing to this premature hemoglobinization, large cells result, the cytoplasm of which is very rich in hemoglobin and the nucleus of which has the dense, reticular structure of the hemato-gonia (the *noyau perle* of the French authors). These cells are megaloblasts, which were first described by Paul Ehrlich and which are typical of pernicious anaemia and certain other forms of hyperchromic macrocytic anaemia. Turnbull emphasizes that much confusion has been caused by the erroneous identification of the megaloblast with the earliest cell forms of erythropoiesis. The latter are found in many types of severe anaemia. The megaloblast of

pernicious anaemia is a cell which contains hemoglobin and which loses its nucleus by pyknosis and extrusion like the normoblast. The product of the megaloblastic erythropoiesis is rich in hemoglobin, a real functional giant which is doomed to quick destruction, since it is an abnormal cell. The majority of the investigators consider the megaloblast as characteristic of pernicious anaemia (Arinkin, Becart, Dameshek Holmes and Broun, Jagic and Klima, Loewinger, Naegeli, Peabody, Piney, Segerdahl, Tempka and Braun, Turnbull, Van der Merwe and others). Van der Merwe recommends examination of the sternal bone marrow for the differential diagnosis of pernicious anaemia and carcinoma of the stomach with pernicious-like blood changes. In contrast to the proliferation of the erythrogonias and their abnormal maturation into megalocytes and giantocytes, erythroblasts and normoblasts are scanty in the bone marrow of cases of pernicious anaemia. The granulopoietic tissue which is relatively diminished in quantity presents certain anomalies. Thus the myeloblasts are increased in number and there is a premature lobulation of the nucleus, which starts at the time when the granulation is still scanty and young. The lobulation of the nucleus progresses and when the mature leukocyte is formed its nucleus has many more segments than the normal leukocyte (so-called shifting to the right). When the dysplasia of the bone marrow of pernicious anaemia approaches the stage of exhaustion, plasma cells become a conspicuous feature. Peabody and many others have observed that in pernicious anaemia the reticulum cells of the bone

marrow become transformed into macrophages which engulf many erythrocytes. This erythrophagocytosis seems to be pronounced only in autopsy material.

The anti-anaemic treatment prompts a reversion of the megaloblastic erythropoiesis to the normoblastic type (Becart, Dameshek, Peabody, Van der Merwe). A similar reversion takes place during a spontaneous remission. The megaloblasts disappear, the most immature cell forms decrease in number, and erythroblasts and normoblasts dominate the picture. The red marrow recedes to the trunk. Nordenson states that with liver therapy the return to the normal blood formation requires approximately twelve days. Segerdahl observed, after large doses of liver, a disappearance of the megaloblasts within twenty-four hours and suggests the determination of the disappearing time as a criterion for the potency of an antianemic substance. Under the influence of infectious irritation the dysplastic bone marrow of pernicious anaemia may fail to respond to antianemic treatment.

In the macrocytic anaemia of sprue the cytologic picture of the bone marrow is similar to that of pernicious anaemia but the megaloblastic transformation is decidedly less marked (Witts, Fairley and Goodhart, Rhoads and Castle, Turnbull). The response to effective treatment is the same as in pernicious anaemia. The macrocytic anaemia associated with diseases of the liver fails to show the megaloblastic reaction of the bone marrow (Rossier, Melamos).

The bone marrow of the patients with hypochromic microcytic anae-

mia is hyperplastic and the erythropoiesis which does not show any obvious morphologic anomalies predominates over the granulopoiesis. Megaloblasts are absent (Dameshek, Vander Merwe) but small groups of erythrogonias are found. There are numerous normoblasts and, in severe cases, also many polychromatophilic erythroblasts. It has been in the final stages of erythrocytic maturation. Under adequate iron therapy the hyperplastic marrow recedes.

Loewinger, Boung and Osgood, Dameshek and Weiner and Kaznelson describe a great predominance of the nucleated red cells in the bone marrow in cases presenting hemolytic family jaundice. The nucleated red cells vary considerably in size, and macronormoblasts and micronormoblasts are found. After splenectomy the macronormoblasts disappear but the micronormoblasts persist. According to Jones, the erythropoiesis in acholuric family jaundice shows a peculiar though non-specific anomaly which consist of the direct transformation of the reticular cells into normoblasts without intermediary stages of differentiation. In sickle cell anaemia the nucleated red cells of the bone marrow are of normal shape. In the erythroblastic anemias of infancy and early childhood the bone marrow is extremely hyperplastic, leading to a more or less marked reduction of the bony structures. The marrow is crowded with erythroblasts and there are also many erythrogonias. Normoblasts are often less conspicuous than the earlier forms of erythropoiesis. The granulopoietic tissue which is relatively scanty, may be rich in oxyphilic myelocytes, and the megakaryocytes are numerous.

In typical aplastic anaemia the bone marrow fails as a unit (Frank, Lescher and Hubble, Middleton and Meyer and many others). Pure red cell aplasia is very rare. A considerable number of authors have been struck by the fact that in cases which clinically show most of the symptoms of aplastic anemia the bone marrow is found normal or even hyperplastic (see for instance Thompson, Riceter, and Edsall). These cases, however, usually show some evidences of regeneration in the peripheral blood and should properly be separated as pseudo-aplastic anemia from the true aplastic anemia. In analogy to the observations of Frank, Sheard, Dameshek, Young and Osgood and others, I have found in typical cases of aplastic anemia an extreme exhaustion of the bone marrow. Careful search may disclose an occasional small nest of myeloid cells, but the majority of the cells that are found between the fat cells prove to be plasma cells, lymphocytes, monocytes and proliferated histiocytes. There are no apparent differences in the histologic picture of the bone marrow between the cases of idiopathic and symptomatic aplastic anaemia. In osteosclerotic anaemia the bone marrow changes into connective tissue, which latter becomes ossified. The ossification of the marrow cavities may be secondary to an aplasia of the bone marrow, as for instance in the senile osteosclerotic anaemia, or it may be due to a congenital anomaly of the bone forming tissues, as in Albers-Schoenberg's marble bone disease.

Polycythemia Vera.—Vaquez's disease is associated with a hyperplasia of all the elements of the bone marrow (hyperplastic pamyelopathy

of Askanazy). Reznikoff, Foot and Bethea have recently advanced the theory that the increase in red cells may be the reaction to a fibrosis of the wall of the capillaries and arterioles of the bone marrow which causes an anoxemia and a compensatory excessive erythropoiesis. Whether this explanation holds true for all cases of polycythemia remains to be shown. It does not take into account that not only the erythropoietic tissue is hyperplastic but also the granulopoietic tissue and the megakaryocytes, and that polycythemia vera shows the tendency to change into myelogenous leukaemia. Attempts have also been made, to consider polycythemia vera the counterpart of pernicious anaemia and to explain it on the basis of an excessive production of the hematopoietic (anti-anemia) substance which is supposed to be formed in the stomach (Morris, Hitzenger, Barath and Fulop).

Agranulocytosis.—Similar to the disturbances of erythropoiesis one can distinguish between hyperplasia, hypoplasia, aplasia and dysplasia of the granulopoietic tissue. Agranulocytosis is one of the most striking examples of the discrepancies that may exist between the condition present in the peripheral blood and the condition of the bone marrow. Schultz and after him many authors have described an aplasia of the granulopoietic tissue as characteristic of agranulocytosis, and unquestionably in some instances the disappearance of the granulocytes from the circulating blood is due to an exhaustion of granulopoiesis. In their recent book on agranulocytosis, Sabrazes and Saric expressly state that the bone marrow of the

sternum, vertebral bodies and epiphysis of the long bones is devoid of granulocytic elements. Soon after Schultz's first publication it became, however, apparent that aplasia of the granulopoietic tissue was not the rule in agranulocytosis and that cases occurred in which the bone marrow was either normal or hyperplastic. The combination of a profound neutropenia of the circulating blood with an active multiplication of the progenitors of the neutrophils in the bone marrow induced Fitz Hugh and Krumbhar to suggest that the essential disturbance in agranulocytosis might be an arrest of the maturation of the granulocytes. In a subsequent study Fitz Hugh and Comroe brought forward additional proof for this explanation, which was also greatly strengthened by the careful histologic investigations of Custer and Darling, Parker and Jackson. Custer pointed out that the failure of the proliferating myeloblasts to differentiate into myelocytes and neutrophilic leukocytes might result from the lack of an intrinsic maturation factor. Similar to pernicious anemia, in which the erythron is affected agranulocytosis then would be a dysplastic condition of granulopoiesis. From the cases of agranulocytosis which I have studied I have obtained the impression that the early cell-forms of the granulopoietic series proliferate but that they fail to mature because they degenerate. This degeneration, which may be caused by toxins or which may be an allergic phenomenon, explains, I believe, better the fulminating and so often rapidly fatal course of the disease than a mere maturation arrest. Tissue cultures made from the bone mar-

row of patients suffering from agranulocytosis may help to decide whether it is a maturation arrest or a degeneration that prevents the young granulopoietic cells to ripen. In the case in which the peripheral neutropenia is associated with an active proliferation of healthy, young granulocytes in the bone marrow, a disproportion between the supply and the destruction of the mature granulocytes in the circulating blood may exist, just as in hemolytic anemia the increased erythropoiesis fails to compensate for the destruction of the erythrocytes. The investigators who distinguish sharply between idiopathic and symptomatic agranulocytosis emphasize that the maturation arrest is pathognomonic of the idiopathic form and is not observed in the symptomatic form. The other elements of the bone marrow do not seem to be affected in agranulocytosis. Prolonged agranulocytosis leads to a proliferation of the plasma cells and histiocytes of the bone marrow.

The Leukaemias.—In leukaemia the bone marrow is usually very hyperplastic. The microscopic picture of the leukemic bone marrow depends on the type of leukemia, but within the same group considerable individual variations may occur. In chronic myelogenous leukaemia there is a diffuse hyperplasia of the bone marrow and I have often observed that the relation between erythropoiesis and granulopoiesis is maintained at the normal level. The granulopoietic tissue is composed mainly of myeloblasts and promyelocytes. The latter are unusually large and their granulation is atypical, irregular and scanty. The myelocytes may mature

to fairly normal neutrophilic leukocytes. In cases presenting very high counts of the white blood cells I have frequently found that the neutrophils which are derived from the abnormal myelocytes are small and crippled with a poorly defined granulation, a scanty cytoplasm and an abnormally lobulated nucleus. Thus there is in these cases not only a hyperplasia but also a dysplasia of granulopoiesis. Some cases of myelogenous leukaemia show a predominance of eosinophilic or basophilic myelocytes and leukocytes.

The more rapid the course of the leukaemia, the greater is usually also the percentage of the earliest cell forms. In acute myelogenous leukaemia the bone marrow is packed with myeloblasts. In many cases of acute leukemia, especially in children, the hemocytoblast excels by far all other cells. The hemocytoblast may show a greater tendency to differentiate in the erythropoietic direction than in the granulopoietic direction. There are cases of acute and of subacute leukaemia in which the proliferation of the megakaryocytes and their precursors is the outstanding feature, and other cases in which the bone marrow consists chiefly of immature monocytes. A few cases of leukaemia have been described in which the bone marrow is composed of plasma cells.

In most of the cases of lymphatic leukaemia the bone marrow resembles lymphatic tissue. Granulopoietic and erythropoietic tissue, however, persist in the form of small perivascular islands which, under the influence of complicating infections, may become greatly activated and

replace most of the lymphatic tissue. In this connection I mention the atypical cases of lymphatic leukaemia in which the proliferation of the lymphatic cells is confined to the bone marrow, and the liver, the spleen and the lymph nodes are not affected (medullary lymphatic leukaemia of Aubertin, Liotta, Fries, Hirschfeld and Zanatz).

It is in the atypical cases of leukaemia in which the blood examination or the clinical picture does not correspond to the classic description that the biopsy of the bone marrow will be found very useful. I refer to the acute aleukaemic leukaemias, which are often confused with aplastic anemia, thrombocytopenic purpura or septicemia, and to chronic aleukaemic myelogenous leukaemia, which is frequently diagnosed as morbus Banti or sepsis lenta. During the past few years I have studied forty-seven cases of acute leukaemia seven of which were aleukemic throughout their entire course, which had never shown a leukaemic blood picture. In none of these nine cases was the leukaemia recognized during life. The value of a new method can be appreciated if one is familiar with its limitations. There are rare cases of leukaemia in which the bone marrow biopsy is disappointing. Long standing myelogenous leukaemia, in particular its aleukemic variety, may finally lead to an exhaustion of the bone marrow and the marrow becomes replaced by connective tissue or bone (osteosclerotic aleukaemic myelosis). In the early stages of very acute cases of leukaemia the bone marrow may be hemorrhagic and poor in myeloid cells. (Jaffe, Segerdahl).

Thrombocytopenic Purpura.—According to the current conception the megakaryocytes are the source of the blood platelets, and thrombocytopenic purpura (Werthof's disease) has therefore often been attributed to an alteration of these cells. Because of the loss of blood from the multiple hemorrhages the bone marrow is hyperplastic.

The megakaryocytes are numerous. I have counted from two to four megakaryocytes per hundred bone marrow cells. Many of them are well preserved, except that they are smaller than normal and that their fine, azurophilic granulation is often missing. This disappearance of the specific granulation of the megakaryocytes has been stressed by Frank and Schmincke, and Frank believes that it may be due to a maturation arrest. Frank and Schmincke describe also severe degenerative changes which I have not been able to find. It should be remembered that single degenerating megakaryocytes are present in the normal bone marrow. Rohr refers to a peculiar configuration of the megakaryocytes in thrombocytopenic purpura: the cytoplasmic protrusions disappear and the cell borders become straight and sharp. After splenectomy the budding of the cytoplasm is said to reappear. From these observations it would seem that thrombocytopenic purpura is due to a dysplasia and not to an exhaustion of the thrombocytopoiesis. Falconer and Morris advise against biopsy of the bone marrow in cases of purpura.

Haemophilia.—In a recent publication Custer and Krumbhaar describe the appearance of the bone

marrow in three cases of hemophilia. They emphasize that the erythropoiesis and granulopoiesis are strictly normal, both being very active, and that the megakaryocytes are distinctly more numerous than normal. The morphology of the megakaryocytes shows no anomalies.

Tumors of the bone marrow.—

It is interesting to note that the plasma cell, which plays only a minor role in normal blood marrow, is the most common source of primary neoplasms of the bone marrow. Of the myelomas that I have recently studied, eight were composed of plasma cells, one of myelocytes and one of lymphoblasts. In the literature there are also reports on erythroblastic myelomas. Of the other tumors that originate in the bone marrow I mention reticular cell lymphosarcoma, liposarcoma and benign angiosarcoma and angiosarcoma.

Bone marrow biopsy.—The upper portion of the sternum, at the height of the second or third rib, has been found the most suitable place for the removal of samples of the bone marrow; the sternal marrow remains active throughout life, and the anterior cortex of the bone is only from 0.9 to 2 mm. thick. The thickness of the sternum amounts to about 1 cm. (Van der Merwe). Two methods have been recommended, one of which consists in the removal of a core of marrow with the aid of a small trephine (Custer, Dameshek, Tuohy and Gillespie) while the other is based on the aspiration of marrow fluid through a modified spinal puncture needle (Amprino and Penati, Arinkin, Baserga, Becart, Henning, Klima and Rosegger, Young and Osgood).

For research and systematic studies the former method is the method of choice, since it permits of the marrow with preservation of the topographic relations of the cells and also the preparation of smears and imprints. Aspiration biopsy has the advantage of simplicity and does not require the technical skill that is necessary for the first method. With aspiration biopsy one must keep in mind that the aspirated fluid does not give the correct picture of the bone marrow *in situ* because cells that are still connected with the reticulum are less apt to become mobilized than cells that are free. The inflowing blood will necessarily dilute the aspirated material and it is therefore advisable not to aspirate more than 0.1 or 0.2 ccc. After coagulation in a small watch glass the aspirated fluid can be fixed and sectioned like a piece of bone marrow (Amprino and Penati). In the majority of cases a carefully prepared spread of the marrow fluid will be found sufficient to obtain definite information as to the condition of the bone marrow.

Angina Pectoris C. P. PERRY, (*Med. Press & Circular*,) London, 191. 533. Dec. 1935. Perry points out that three characteristics serve to differentiate anginal pains; the squeezing, constricting nature of the pain, its site and the relationship of the pain to physical or mental activity. A fourth feature which is not constant, is the psychological component of the symptoms, the sense of impending death. This feature may be described with pain other than anginal, for instance, with the pain of gall bladder disease. The two conditions likely to be

confused with angina are coronary thrombosis and the left infra mammary pain or 'Heartache' so frequently seen in debilitated anxious women. In coronary thrombosis the pain is identical in character, but if anything, more severe than that of angina pectoris, and the patient may give a history of previous attacks of typical angina. Left infra mammary pain affects women far more frequently than men and is typically situated under the left breast, or as the patient usually says 'over the heart.' It occurs characteristically, not during exertion but when the patient is resting at the end of a long and tiring day, and it lasts for hours long after exertion has ceased. This symptom may occur in patients with normal or pathologic hearts but in no way affects the prognosis and must be carefully distinguished from angina pectoris, with which it has no connection. Angina pectoris occurs as a symptom in various diseases and the main pathological processes with which it may be found are coronary sclerosis and atheroma; hyperpiesia; syphilitic aortitis; aortic incompetence due to rheumatic heart disease, syphilitic aortitis or bacterial endocarditis; severe anaemias, particularly pernicious anaemia, and occasionally hyperthyroidism or paroxysmal tachycardia. In attempting to formulate a prognosis the first thing to consider is the underlying pathological condition. If the angina occurs as a symptom of cardiovascular syphilis this in itself gives an average expectation of life of five years. If the cause is a severe anaemia that will respond to treatment, the outlook is correspondingly bright. In the majority of cases, however, no abnormal physical signs are found

in cardiovascular system, with the possible exception of abnormalities in the electrocardiogram. Factors indicating a poor outlook are rapid progress in the frequency of attacks and diminution in the amount of effort required to induce the pain. Such a state of affairs obviously indicates a rapidly progressive lesion. Another factor is the degree to which the patient can and will consent to limit his activities and attempt to live within his cardiac reserve. A poor prognosis is indicated by the discovery of any evidence in ventricular failure and also by the occurrence of attacks of paroxysmal nocturnal dyspnoea (cardiac asthma). The treatment of usual coronary form of angina consists in the relief and prevention of attacks. Relief in the majority of cases rapidly follows cessation of activity that induced the attack. This relief may be hastened by the administration of alcohol or the inhalation of amyl nitrite. If the pain continues despite rest and nitrites, it suggests an attack of coronary thrombosis, and it is undesirable to repeat a dose of amyl nitrite, since in the coronary thrombosis the essential factor is that the blood pressure should be kept as high as possible in order to encourage the opening of anastomotic channels.

THERAPEUTICS

Subcutaneous Oxygen Therapy in Pneumonia E. YA. FISHENZON (*Vrach Delo*, Kharkov. XIX, 391, 1936) believes that the amount of oxygen absorbed into the pulmonary alveoli when administered by the inhalation method is insignificant. This must be particularly true in Crupous pneumonia

because of the occlusion of pulmonary alveoli. In the past ten years he has treated 260 cases of Croupous pneumonia by the method of subcutaneous injection of oxygen. The dose injected varied from 200 to 800 c.c. This may be given twice daily in the severe case and daily or once in two days in milder cases. In children the initial dose was 50 c.c., while the maximum dose did not exceed 200 c.c. Danger of embolism is minimised by the fact that oxygen is readily soluble in the blood. He concludes on the basis of clinical observations and animal experiments that oxygen introduced subcutaneously is absorbed and gives rise to oxidising processes, much the same as it does in the lung, serving in fact as a sort of complimentary vicarious "subcutaneous respiration." The oxygen thus absorbed enters the circulation and is partly absorbed by plasma, while the rest combines with the haemoglobin subcutaneous oxygen therapy appears to be particularly effective in the grave cases of pulmonitis accompanied by cyanosis, cardiac weakness and pronounced intoxication. The favourable effect of this therapy is exerted on the respiration and the function of the cardiovascular system. Dyspnoea and cyanosis tend to disappear, the blood pressure rises and the cardiovascular system functions more vigorously. The effect of oxygen is strikingly reflected in the lowering of the viscosity of the blood. This seems to be an effective method, in the authors' opinion, of combating the toxic-infectious state but not a specific therapy in pneumonia. The technique of administration is simple, safe and harmless.

(J. A. M. A.)

Acute Toxaemia of Burns.—Extract of Suprarenal Cortex in Treatment. (W. C. WILSON, G. D. ROWLEY and N. A. GRAY, (*Lancet* June 20, 1936, p. 1400). Acute Toxaemia from burns resulting in death shows P. M. severe necrosis and degeneration of the liver cells. The toxaemia is produced by the action of circulating toxins formed by autolysis of injured tissues in the burnt area. The principles of effecting treatment in most cases are immediate coagulation of the burned area by a strong solution of tannic acid and when necessary maintenance of a normal blood pressure level by i-v injections of gum saline, dextrose saline and also intravenous alkali. A therapeutic measure of considerable promise for the treatment of the very dangerous early stages in the course of an extensive burn seems the use of extract of suprarenal cortex as an adjuvant. In three cases quoted, toxaemia in an acute form had developed and in fact, a fatal issue within a short time would have occurred but for the administration of the extract of suprarenal cortex or *Eucortone*. In 1920, Dale found that suprarenalotomy enhanced the sensitivity of cats to the toxic action of histamine. And by subsequent researches, it has been possible to show that the loss of resistance is probably due to deficiency of cortex; the resistance of animals after suprarenalotomy to toxic agents can be raised significantly by administration of cortical extract. The observations of the authors indicate that it results in an increased efficiency of the circulatory mechanism. The extract should be considered as an adjuvant measure, and not as a substitute for proved and recognised preventive

treatment. The authors certainly regard as essential the employment of local and general measures and have evidence that continuous intravenous infusion of dextrose saline from an early stage of extensive and severe burns may mitigate injury to liver cells. Of the concentrated extract now available (A & H.) 1 c.c.m. every 2 hours from onset of acute toxaemia will suffice for a child, while for an adult 2 c.c.m. or more every hour are necessary. Injections should be continued till 100 hours after injury and should be renewed if toxic manifestations appear.

Acid Ammonium Phosphate as Urinary Acidifier. (S. ALSTEAD *Edin. Med. Jl.* xliii, 292, May 1936. Abst. *J. A. M. A.*) Alstead states that acid sodium phosphate is of negligible value as an acidifier of the urine and that its use should be abandoned. Frequently it actually alkalinises the urine and cannot be regarded as a suitable standard by which to assess the value of ammonium acid phosphate. Acid ammonium phosphate in doses of approximately 2 gm. thrice a day markedly diminishes the pH. of the urine and no further increase in the H ion concentration occurs with greater doses. Despite the administration of large doses of acid ammonium phosphate the pH. of the urine never fell below 4.7 and the maximal acidity of the urine in the great majority of the patients was represented by a pH. of about 5.5. Considerable alteration in pH. was frequently seen, notably in three cases in which the ranges were pH. 8.7 to 5.7, pH. 8.5 to 5.8 and pH. 7.8 to 5.2 respectively. In these cases the urine was already alkaline when the administration of ammo-

nium acid phosphate was begun. In patients whose urine was previously fairly acid (about pH. 6) the use of the ammonium salt produced comparatively little change in the H ion concentration. The saline cathartic action of acid ammonium phosphate appeared when the daily dose amounted to 17 gm., i.e., about 3 times the effective dose for acidifying the urine.

CHEMOTHERAPY.

A New Arsenical in Treatment of Syphilis and Trypanosomiasis. (YORK AND MURGATROYD, *B.M.J.*, May 1936, 1042.) As a result of examining the typanocidal activity of a large number of arsenical products, Yorke and Murgatroyd selected sodium succinylmethyl amide-p-arsenate for detailed therapeutic trial. In experimental animals this substance compared favourably with trypanamide in being less toxic and somewhat more efficient as trypanocide. In man doses of 2 to 4 grams weekly were well tolerated. The usual course consisted of the administration of this amount weekly until a total dosage of 30.36 grams had been given. A number of patients had been so treated the total quantity ranging from 66-141 grams and one had an uninterrupted course of 69 grams, without showing signs of toxicity. Apart from occasional nausea and vomiting, the only toxic signs observed were mild arsenical dermatitis in two patients and temporary jaundice in three advanced cases of neurosyphilis after prolonged courses of the drug. Usual disturbances have not been encountered the drug exhibited the stimulating action associated with trypanamide and other pentavalent aromatic arseni-

cals. In contrast with tryparsamide the new drug exerts a definite action in primary, secondary and tertiary syphilis. In primary syphilis it alone is inadequate since, although the lesion cleared up rapidly, secondary manifestations developed subsequently. When it was combined with bismuth the effects on primary syphilis seemed to be more permanent, and so far none of the patients treated in this way have relapsed. It has a definite action on tertiary manifestations of syphilis; the lesions disappeared completely in twenty of twenty-five cases. In early neurosyphilis and in tabes it gave satisfactory results. Of eleven patients with Nigerian sleeping sickness treated by a single course, ten became clinically normal and the other was improved. Eight of these patients had pathologic spinal fluids at the time of treatment. In three of them the fluid had become normal after the single course of treatment, in two it had become considerably improved and in one pathologic changes had apparently increased, although clinically the patient had become quite normal, the other two patients owing to their clinical improvement, did not complete the treatment. In addition a twelfth advanced case, which had failed to react to full courses of tryparsamide and other drugs, improved remarkably after a course of the compound.

Treatment of Human puerperal infections and or experimental infections in mice with Prontosil (L. COLEBROOK AND M. KENNY, *B. M. J.*, June 6th, 1936). Early in 1935 Domagk in Germany announced a chemotherapeutic success on streptococcal sepsis with Prontosil. In France, Levaditi and Vaisman used a similar

compound and obtained curative results in mice experimental infected with a streptococcus 'M' of human origin. Laboratory experiments and clinical trials were carried out by the authors with Prontosil or the more soluble related compound (Streptozon S) and with p-aminobenzenesulphonamide. They found that besides obtaining curative effect, a large subcutaneous dose in suspension protected mice against infection four days later with the highly virulent streptococcus. Curative effects were also obtained with p-aminobenzenesulphonamide. Clinical trials in Puerperal fever cases were very encouraging and support the view that further clinical trial is justifiable, and that there is more hope of controlling these streptococcal infections by early administration of this or some related chemotherapeutic agent. Very little is known at present as to how it acts as a bactericide in the animal body.

In the same No. of the Journal Buttle, Gray, and Stephenson announce the results of experiments with p-aminobenzenesulphonamide. They found that there was protection of mice against streptococcal infection, and a certain amount of protection against the meningococcus, but not against staphylococci or pneumococci.

GYNAECOLOGY.

Sterilisation by High Cervical Amputation. W. ZOEFGEN, (*Zentbltt. F. Gynak*, 60 29th March 1936) cites factors suggesting that a normal upward passage of the sperm into the uterine body and an undisturbed pregnancy are

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impossible without the cervix. Accordingly he raises the question whether simple amputation of the cervix might not be a substitute for the more complicated methods of sterilisation. Of 24 women in whom he performed amputation of the cervix for the treatment of various pathological condition not one became pregnant again. In these cases the amputation of the cervix had been done as follows: After ample dilatation by means of Hegar's method in order to facilitate the subsequent Sturmdorff plastic operation, the author detaches the anterior and posterior vaginal mucous membrane at os, joins the wounds laterally by an acute-angle incision, detaches the bladder and parametrium anteriorly, and laterally incises posteriorly up to Douglas's fold, divides the cervix by lateral incisions, makes wedge-shaped excisions from the cervix anteriorly and posteriorly, and covers the anterior and posterior uterine wounds according to Sturmdorff's plastic method. The formation of the lips of the os by double threads is further secured by buried sutures of the laterally remaining wounds. In spite of the fact that the cosmetic results were always satisfactory, pregnancies never developed again, and the author concludes that the operation was responsible for the sterility and he employed it for this purpose in two cases. The removal of from 2-3 cm. of the cervical canal is adequate, but even if the amputation is made higher up (intracorporeal), the involved opening of the posterior Douglas space would be a comparatively slight complication compared to the abdominal tubal sterilisation.

Prevention of preputial and cervical Cancer. In the *Lancet* of the 2nd May 1936 Sampson Handley surveys the incidence of preputial cancer and carcinoma of the cervix in the Jewish and non-Semitic races. He finds the incidence of both is definitely less in the Jews. He traces this comparative infrequency to the Jewish custom of circumcision. (One wonders whether this theory will be borne out by a statistical analysis of the incidence of cancer of the prepuce and of the cervix in the Mahomedans in India as compared with their incidence in the Hindus. S. K. S.)

Handley suggests that in races which do not practice circumcision, prepuce should be just slit at birth so that no dirt can accumulate under it.

X-RAY AND RADIO THERAPY.

Liver Extract as Remedy for Roentgen Sickness. B. R. YOUNG, (*Am. J. of Roent. et Rad Therapy*, XXXV, 689, May 1936), gave liver extract to 30 patients suffering from Roentgen sickness. For the purpose of drawing valid conclusions, care was taken to avoid psychic factors and changes of techniques or dosage. Intravenous injections of 2 cc. of the drug were withheld until the patient was definitely suffering from Roentgen sickness. Once the liver therapy was started, the dose or volume of radiation was not reduced. The criteria for Roentgen sickness were vomiting, which ensued during the treatment or more commonly at a definite time interval after it, and marked nausea between the episodes of vomiting

Every effort was made to eliminate systemic disease or gastro-intestinal derangements as causes for vomiting before instituting liver therapy. In most cases it is necessary to give 2 c.c. daily (provided the Roentgen treatments are given daily) if the patient is to be kept symptom free, but in certain cases the beneficial effect will last two days. The author does not believe that it make any difference when the liver extract is given. Most of the patients received it before the Roentgen treatment and others from a few minutes to an hour or two after the treatment. Of the 16 patients who obtained complete relief, only 3 needed more than two injections. Seven patients were relieved of all vomiting, but they complained of nausea at sometime during the treatment series, 7 were classified as failures. 23 of the 30 patients or 77 per cent were either completely or partially relieved by the drug. Liver extract produces an additional beneficial effect, in that Roentgen intoxication is partially or wholly relieved by its use. Listlessness, depression, loss of energy and appetite are the principal features of this malady.

(J. A. M. A.)

Counter-irritation by Ultra-Violet Rays. ALLEN EIDINOW, (*Lancet*, June 20, 1936, 1404).—Wave lengths shorter than 3000 Å. U. applied to the normal white skin cause erythema after a latent period of 4-6 hours. A maximum reaction results about 48 hours later and this erythema may persist for 3 or even up to 12 days, with intensive dosage. Usually from 6-16 skin erythema doses are applied for counter irritation. Following the erythema oedema, and blistering of the skin,

there is drying and desquamation. Pigmentation finally results. The local vascular dilatation may last many months. The reaction is painful and uncomfortable. Special dressings are necessary. Directly after irradiation, adhesive elastoplast strapping is applied to the irradiated area and surrounding skin. This greatly diminishes the pain. The strapping is removed after 14 days and not before. In this way larger doses may be administered without unduly disturbing the patient. The skin area is then cleaned with methylated ether or oil of Eucalyptus.

The types of cases selected for treatment by this technique were those in which symptoms of acute pain were present (brachial and sciatic neuritis, lumbago, etc.); those in whom there was swelling of the joints due to effusion of fluid; those with symptoms of asthma, with dyspnoea, and a definite history of frequent attacks of troublesome respiration. Total or partial relief of symptoms follows treatment. It is very surprising to be able to report favourable results in isolated cases of chronic asthma.

FORENSIC MEDICINE

Alcohol and the driver. (Address by Sir Joseph Barcroft, F. R. S., Professor of Physiology in the University of Cambridge, at 66th annual breakfast of the National Temperance League.) *B. M. J.* Aug, 1936, p. 99). Sir Joseph said that the British Medical Association did him a great honour when three years ago it placed him on its special committee to consider the question of alcohol in relation to road accidents. The final report

of the committee was that "alcohol in moderate quantities has a definitely adverse effect even if taken some hours before driving". In the criticisms of the report no one seriously disputed that for the average person even a moderate amount of alcohol had a definitely adverse effect when taken before driving a car. But they were not all average persons, and the point was discussed by the committee as to the effect of alcohol on the tired person. Was there a case for alcohol when a man was below par through fatigue? Could he 'pull himself together' by taking a drink? Was he a better driver on account of the small amount of alcohol which he took? One member of the committee took the view that alcohol might be regarded as beneficial to the tired man and no doubt in the general run of practice a good many doctors would be found to adopt that view. But the research had been carried out on the average person, not on the tired man, and it seemed to him that some closer research was necessary in this respect. Road accidents continued, yet, when we looked at the matter fairly and squarely, the remarkable thing was not how many accidents there were but how few. It was a great tribute to the care and skill of the driver that the incidence of accidents was not greater. He believed that it would be very difficult to legislate on the committee's report. The law legislated for the average man, but with a margin, and that margin rightly meant that a man must be definitely guilty of some thing very serious before he was convicted by law. It was a matter to be tackled by public opinion and the public conscience.

Anything that could be done to ascertain the precise effect of alcohol on the fatigued man was well worth doing.

PREVENTIVE MEDICINE.

Malaria Campaign in Burma

(*B. M. J.* No. 3943 Aug 1, 1936 p. 257.) In the rural areas of Burma malaria is the chief cause of mortality and ill-health, the infection being widespread. An illuminating account of the difficulties met with in dealing with this scourge is recorded by Lieut. Col E. Cotter, I. M. S., the Director of Public Health in Burma, in his annual report for 1934. Extensive schemes of drainage and land reclamation are not practicable, and the issue of cinchona febrifuge tablets is at present the most effective weapon among the villagers. Free issues of tablets are made to those who are too poor to pay for them. In recent years unfortunately quack doctors ("sesayas") in the country districts have spread a belief among the people that they are being attacked by a new disease, which they have named "metkalaung". This belief started in the Shan States, and has now spread widely; the disease is nearly always malaria. The "sesayas" teach that the physical signs are pimples inside the anal orifice, and that these must be pricked with a needle or a thorn. These pimples exist only in the imagination of the "sesayas", and the harm done by this heresy has been considerable. The Government has been obliged, therefore, to issue a pamphlet in Burmese to counteract this harmful teaching. In 1934 a severe outbreak of malaria occurred in the Hantha-

waddy district. Relapses were frequent owing to the villagers having to return to their fields to reap their crops immediately after the fever had subsided. Most of the villages have on the average three tanks each of drinking water, which are overgrown with aquatic vegetation and are favourable breeding places for the *Anopheles aconitus*. An attempt has been made to cope with this source of infection by the introduction into the tanks of larvivorous fish. Febrifuge tablets are being freely distributed, for the proximity of Hanthawaddy to Rangoon gives cause for anxiety. The present immunity of Rangoon to malaria depends on the very small extent to which malaria mosquitoes are found and the absence of an extensively infected population. Were either

factors removed, a serious outbreak would become likely. The surrounding rural areas are therefore being carefully watched for outbreaks of malaria, and the Rangoon Corporation is launching an anti-malaria campaign, which it is hoped will preserve for the city its present freedom from infection. Prophylactic work is in progress in certain districts where refuse destruction, the drainage of swampy areas, and oiling or treatment by Paris green are possible. The average consumption of cinchona febrifuge per head of population rose from 0.87 grain in 1933 to 1 grain in the year under review, yet the use of the tablets is disappointingly low in some of the worst areas, and the necessity of educating the villagers is very obvious.

Jottings from Far and Near.

TEMPERANCE NOTES FROM LONDON

Excise and Drink Consumption in India

The Marquess of Zetland, answering Lord Clwyd in the House of Lords on July 15, gave some figures as to Excise Revenue and liquor consumption in India during recent years. There has been no appreciable change in the last quinquennium. The net excise revenue, which was £11,143,000 in 1931-32, reached the figure of £11,285,000 in 1934-35. During the same period the total recorded consumption of country spirits was as follows:—

	Gallons.
1931-32	... 4,044,996
1932-33	... 3,879,769
1933-34	... 4,014,153
1934-35	... 4,071,116

In 1920-30 the number of shops licensed for the sale of intoxicating liquor was 117,434, a figure which was reduced to 112,939 in 1934-35.

MORE SHOPS

It is to be feared that most of these figures will show an upward tendency during the period which has followed. A reversion to the outstill system in some Provinces—notably Bihar—is bound to contribute to this result, for all experience proves that this method of selling drink is not easily controlled, while at the same time consumption cannot be so accurately recorded.

Then as regards the number of shops, most of the information to hand is to the effect that in many districts many new shops have lately been opened, mainly on the ground that this is the only way of combating the sale of illicit liquor, and this increase has often taken place in spite of the protests of the local public. The net result of such a policy must be an extension of the drink habit, with all the consequent poverty and degradation which it involves.

EXCISE REVENUE PROVINCIAL PROPORTIONS

With other information the Secretary of State was asked to give the percentage of the net excise revenue to total Provincial revenue in the case of each Province in 1934-35. Here are some of the more striking figures:—

	Per cent
Madras	... 27.1
Bihar and Orissa	... 25.5
Bombay and Sind	... 24.0
Central Provinces Berar.	13.3
Bengal	... 12.4
United Provinces	... 21.8
Punjab	... 9.4

It is difficult to understand why there should be such variations in these figures. How is it that in Madras, for instance, more than a quarter of the entire provincial revenue should be derived from the sale of drink, whilst in the United

Provinces only one-ninth is obtained from this source.

THE COMING ELECTIONS

When Excise was transferred, however haltingly, to Indian control it was hoped that Ministers in charge of the Department would at once introduce a policy of drastic liquor restriction. This result, it must be confessed, has not been realised, owing to causes which have not always been under the control of the Ministers themselves. The Provincial Administration Reports do not make very cheerful reading for temperance reformers. Under the influence of influence of financial secretaries and other officials, Excise Ministers have too often consented to measures which are morally unjustifiable.

There ought to be a very marked change of policy under the new regime which is about to be inaugurated. This can only be achieved through an instructed public opinion and the vigilant action of temperance and other reform organisation. I am glad to learn that in view of the coming elections our friends in Madras and certain other Provinces are taking steps to approach all candidates for the new Legislatures asking for a statement of their views on Temperance reform. It should be easy to draft a few simple questions on this subject, adapted to the conditions of the various Provinces. The answers having been received a short statement should be issued indicating the position of each candidate and advising the electors as to the names of those most deserving of Temperance support. Such an in-

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quiry would at least enable us to know who are our friends in the new Assemblies, and after the elections it would be possible to take further action in those bodies.

ALCOHOL AND MOTOR TRANSPORT

The International Temperance Union (which was the outcome of the World Congress on Alcoholism held in London two years ago) has set up a Commission to investigate the relation of alcohol to the Road Traffic problem throughout the world. The results of such an investigation should be of great propaganda value to the Temperance movement and also to various public authorities responsible for transport.

A questionnaire on this subject has been circulated to representative Temperance workers in India, with a request that they will return brief answers for their respective areas, on as many of the points as possible. When the information has been received from other countries as well as from India, the results will be tabulated and made known through your columns.

On the subject there is a useful article by Dr. H. M. Vernon in the current issue of "The Human Factor" the official organ of the National Institute of Industrial Psychology. Dr. Vernon, who has recently carried out some valuable experiments in this connection, writes:—

"It is universally admitted that the consumption of a large quantity of alcoholic liquor diminishes the capacity of a driver to control his motor vehicle, but many drivers re-

Jottings from Far and Near

fuse to admit that a strictly moderate quantity has any adverse effect, and some of them claim that it improves their driving. These views are opposed to the mass of information obtained from various laboratory tests, which show that alcohol diminishes attention and judgment and impairs the ability to make movements dependent on rapid and accurate co-ordination."

One result of the tests referred to is to make it clear that even very limited doses of alcohol do render the motorist less capable of controlling his machine.

GUARDING THE YOUTH OF JAPAN

For the first time the position in favour of raising the age limit at which alcoholic drinks may legally be brought and consumed to 25 years has been accepted by the Petitions Committee of the Japanese Parliament. The 25 years Bill has now been presented to the Diet itself, signed by some 60 members. It is noteworthy that the Proletarian Party signed as a whole.

There are several strong supporters of Temperance in very prominent positions in the Japanese Diet, they will do their best to advance the cause. The new Minister of Education is a Temperance man. He is the founder of the important Konan College, between Osaka and Kobe. In that College the students are required to be abstainers. If they are known to drink they are expelled. No cafe or bar is allowed near the school. The Minister declares that the order in Government schools in regard to the frequenting of drinking places by the students requires considerable strengthening.

PUBLIC HOUSE—A PUBLIC NUISANCE

There is an organisation in England known as the "True Temperance Association," the objects of which are entirely opposed to what we understand as temperance or total abstinence. Its claim to be a Temperance Association is sufficiently discounted in the statement of its aims, one of which is "To encourage the development of the public house in the direction of making it in the best sense a place for the present bad social needs of the people, and to help in the removal of all legislative and administrative hindrances to such developments."

The current issue of the Association's journal contains an article on "Housing Estates and Public Houses," in which it is urged that opportunity should be taken in the development of very new building estate to provide suitable drinking places for the prospective inhabitants, the contention being that such a provision would in every way promote the interests of new community centres.

In a letter to the Editor I ventured to put two simple questions to the writer of the article referred to

(1) How is it that the proximity of a public house (liquor shop) always depreciates the value of surrounding property?

(2) Would the writer of the article choose by preference to take a house for residence adjoining licensed premises—even of the improved variety?

In his reply the Editor rather weakly expresses the opinion that the proximity of licensed premises does not always depreciate the value of surrounding property. He says it depends upon the nature of the surrounding property, viz., whether it is residential or part of a shopping area, in taking this line he practically concedes the whole case and he must know that all experience confirms the view that premises licensed for the sale of drink do affect prejudicially the value of adjacent property.

In reply to the second question this advocate of "true temperance" says that he could throw a stone from his own house to two public houses and that if he went into training he could probably hit a few others. This may prove the redundancy of such places in his particular neighbourhood or his own skill in stone-throwing, but it does not show that a public drinking shop is a desirable place to live next door to or that the stone-thrower himself (to say nothing of others) would choose such a spot for his dwelling house.

PROGRESSIVE MYSORE

There are quite a number of efficient temperance organisations in various parts of India, and none of them is doing more effective work than the Mysore State Temperance Federation, whose annual report is now before me. The Federation has a hardworking and experienced Hon. Secretary in Mr. J. R. Isaac, M.B.L., who was well known to some of us when he was Warden of the Indian Students' Hostel in London a few years ago.

One of the Federation's most useful pieces of work is the publication, in conjunction with the Deena Seva Sangha, of a series of striking picture posters illustrating the evils of a strong drink and the advantages of abstinence. I am frequently asked by Indian correspondents whether charts and posters suitable for India are obtainable in England. My reply to these inquiries is invariably that it is better to have these things prepared in India by those who are familiar with Indian conditions, and this is exactly what the organisations I have mentioned are doing—in which connection I must also acknowledge the similar very excellent publications produced by the Indian Women's Christian Temperance Union.

As regards Mysore, I may mention that I had an interesting talk a few days ago with Sir Mirza Ismail, the State Dewan, who takes a strong personal interest in the work of the Temperance Federation, of which he is the Patron. As a good Moslem he is naturally in full sympathy with such a movement, and as Prime Minister of one of the most progressive States in India he is well aware that the prosperity and happiness of Mysore's population depends to a large extent upon the effective restriction of the drink traffic and the dissemination of total abstinence principles. It is satisfactory to find that the Government of Mysore is encouraging the Temperance movement by making financial grants to the local organisation.—(*Hindu's special Correspondent*.)

A DIVER'S ORDEAL.

J. M. aged 56 a diver, was working in a scotch loch, 170 feet below the surface, when water entered his suit and at this high pressure paralysed his legs. When he sent a message to the surface the men above knew that if they pulled him up slowly he would almost certainly drown and that if they pulled him up quickly he might die as a consequence of the sudden change of pressure on his body. They decided to pull him fairly quickly, and the rapid change caused bubbles of nitrogen to form in his blood, which threatened to stop the circulation. Twice he was sent down again in another diving suit and brought up slowly in an endeavour to drive out the bubbles. But he was unable to stand the cold until these measures were successful and it was decided to send him to London. From the hospital he was sent to the premises of Siebe, Gorman & Co., submarine engineers, where he was again placed in a decompression chamber. While a careful watch was kept through the observation window, the air pressure was slowly increased until equal to that to which he was subjected when 170 feet under water. Slowly he moved his limbs about, striving to drive out the nitrogen bubbles. Six hours later the pressure was slowly reduced. He derived considerable benefit and was able to move his right leg strongly and his left leg a little. He was then taken back to hospital.

J. A. M. A.

DOCTORS WITH INDIAN DEGREES

BAN IN FRENCH AND
PORTUGUESE INDIA

Medical Council Negotiates for Reciprocity

The Executive Committee of the Medical Council of India which met in Simla on August 13 and 14 considered a long agenda. One item concerned the anomalous position, as regards medical practice, of French and Portuguese India.

Inquiries had been made as regards the conditions affecting Indian Nationals in both these Colonies. In Portuguese India the reciprocity which used to exist between holders of the Medical School of Nova Goa, on the one hand, and the graduates of the Universities of Bombay, Madras, and Burma and Licentiates of the College of Physicians and Surgeons of Bombay on the other hand, was withdrawn under a new Portuguese law in May, 1935.

All holders of foreign medical degrees who wish to practise or take medical appointments in Portuguese Colonies must now repeat the medical course in Portugal.

The Portuguese Governor-General is reported to have represented to his home Government that these local reciprocal arrangements should be re-established, and the matter is being followed up by the Executive Committee of this Council.

IN FRENCH TERRITORY

As regards the French Establishments in India, it appears that, while French practitioners can and do frequently practise in British India territory, no person not on the French Medical Register can practise in Pondicherry or other French territory, and under recent French laws, French nationality is necessary before French registration can be obtained.

British or Indian firms in Pondicherry cannot employ doctors with recognised Indian degrees.

This matter, also, has been taken up in the interests of the holders of British Indian degrees.

Under general directions from the Medical Council of India, negotiations have been opened with many other countries and States outside British India for reciprocal recognition of medical qualifications, and the Executive Committee considered a statement by the Secretary on the position so far reached.

All the countries whose degrees are at present included in the Second Schedule of the Indian Medical Council Act (which are those whose qualifications are included in the Colonial and Foreign Lists of the General Medical Register of the United Kingdom) have been written to—Malta; Ceylon; Hong Kong; the Straits Settlements, South Africa; Canada and five of its constituent provinces; Newfoundland; New South Wales; South Australia and Victoria in Australia; New Zealand; and, of foreign countries, Italy and Japan.

KENYA AND FIJI

Of countries not on the Second Schedule, many of whom do not possess medical degrees of their own the following have been approached:—Iraq; the four East African Colonies of Kenya, Tonganyika, Uganda and Zanzibar; Mauritius; British Guiana; and Fiji—usually because they have considerable Indian populations.

The Committee approved of their draft amended Recommendations on Professional Education, and decided to circulate them to the Universities for opinion before their final consideration by the Council. Madras Mail.

(*Madras Mail.*)

DRUG MENACE IN CHINA

"NARCOTICS—JAPAN'S
SPEARHEAD"

Shanghai Professor's Indictment

Charges that the "Spearhead of the Japanese invasion of China was the gaining of the control of supplies of opium and narcotics" were made by Professor B. E. Read, of the Lester Institute, Shanghai, at a luncheon of the Colwyn Bay Rotarian Club at Colwyn Bay, North Wales.

Rotarians from all over England—from Durham to Torquay—were present.

Professor Read asserted that Japan was more interested in the province she had appropriated in Northern China for its opium than for anything else. He knew that 35 tons of opium had passed through that province last year.

CHINESE FACTORY VICTIMS

No one knew how many drug addicts there were in China, said Professor Read. He did know, however, that opium and narcotic addiction had penetrated North China and had come from Japanese sources.

He doubted, he said, the accuracy of the report by Japan to the League of Nations on the Japanese trade in narcotics.

The flagrant trade in morphine also needed exposing, said Professor Read. While medical men could only obtain the morphine they needed under the most stringent regulations, one could walk into Chinese shops in the International Settlement of Shanghai and buy morphine by the pound.

CHINA'S AWAKENING TO
MEDICINE

Professor Read paid a glowing tribute to China's awakening to modern science, medicine and knowledge of the laws of infection.

In 907 (he said) a Chinese Governor, made to realise the dangers of leprosy, assembled all the local lepers, gave them a feast and then threw them into pits soaked in kerosene and burnt them alive.

Now in Shanghai, a modern leprosarium had been built with all equipment for treating the dread disease.

When Professor Read went to Peking over 20 years ago, he could not get a nurse for the Hospital. Now the Chinese were building and running their own hospitals. Great efforts were being made for the advancement of medical work in all its branches.

But Professor Read unsparingly attacked the conditions in Chinese factories, many of which he had investigated in the course of his work.

"In the past six years", he said, "36 factories have been created in Shanghai for chromium plating. They are not factories as we know them. People just learn the tricks of the trade and set up factories in old fashioned Chinese dwellings where the work is done under conditions that beggar description.

"Employers go into the country and bring back workers of ages ranging from 8 to 20. In these so-called factories they work without wages or holidays. Their bedrolls are in the same room and become covered with dirt and dust. The food given to them is inadequate and the whole system of ventilation impossible.

"WORSE OFF THAN BEASTS"

"In some factories which I visited I saw workers suffering from terrible diseases caused by the effects of the chromium. After an average of three years and eight months in these factories these workers are nothing more than human wreckage."

In fact, Professor Read said, human beings were expected to work under conditions worse than those for beasts. Serious thought on the industrialism which was penetrating the Far East was, he declared, urgently needed. The present position in China was worse and, in its degradation, surpassed anything so far experienced in the present century.—(*Reuter.*)

COOKING IN ALUMINIUM VESSELS

Effect on Food

RESULTS OF RESEARCH BY INDIAN INSTITUTE OF SCIENCE

A comprehensive report of the work done in the various Department of the Indian Institute of Science during the year ended March 31, 1936, was presented to the Governing Council of the Institute at its quarterly meeting.

Most of the subjects in the report refer to research work of technical character and have from time to time been published in the Proceedings of the Indian Academy of Sciences and other scientific journals in and outside India.

The report referring to the work done in the Department of Physics details the results of research work in the "Fundamentals of Physics" "Ultrasonic waves and their applications," a series of investigations on "The Raman Effect" and "Physics in the solid state."

Special value is attached to the results obtained by Sir C. V. Raman and Nagendra Nath in the study of ultrasonic waves. The theoretical reasoning and conclusions arrived therefrom by these two scientists have been confirmed by the results obtained by direct experiments by eminent scientists in Germany and America.

The report of the work in the Biochemistry Department has a chapter of particular interest to the layman as it refers to a scientific study of the effects of cooking foods

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in aluminium vessels and storing cooked food in such vessels,

ALUMINIUM VESSELS

The paper on this subject states:

"Although much work has been done in Europe and America on certain aspects of this problem, the related observations do not apply to Indian foodstuffs which contain considerable quantities of salt and which are in many cases, highly acidic in character. Further, in India the food materials are often stored in containers for fairly long periods, so that the average intake of aluminium will be much higher than in other parts of the world.

"As a result of the systematic investigation conducted by Mr N. C. Datta the following findings are recorded: Fruit and vegetable juices dissolve only a small amount of aluminium from utensils during storage. The amount of aluminium dissolved is not a fraction of titratable acidity, but possibly depends on the nature of the organic acids present as also on the buffering capacity of the food material. The corrosive action of acid foods on aluminium is increased by the presence of salt. The amount of aluminium dissolved by tamarind solution containing salt during storage is very nearly equal to the sum total of the amount of aluminium dissolved by tamarind and salt taken separately, so that each seems to act independently of the other.

"The amount of aluminium dissolved in the ordinary process of cooking is very small, but in cases where acidic foodstuffs are cooked

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and stored for fairly long periods in aluminium vessels, the *maximum* that may be added to the daily diet from utensils will be about 50 milligrams.

"After boiling in aluminium vessels, acid foodstuffs containing salt should *not* be left in the same vessels, especially those in which corrosion has already started.

NO HARMFUL EFFECTS

"Feeding experiments with rats have shown that food prepared in aluminium vessels has no harmful effect on growth, reproduction or general well-being of animals.

"It is not improbable, however; that when taken continuously and incomparatively large quantities, aluminium may have an indirect adverse effect on the animal system. Thus, the phosphorus of the food may be precipitated by the aluminium in solution, leading ultimately, to phosphorus starvation. And other possible adverse effect may be through the spoilage of foodstuff stored in aluminium vessels."

(*Madras Mail*.)

RUSSIA TO-DAY

Medicine under socialism

You are in Moscow. An ulcer has perforated; or, as is all too probable, you have been hit by a motor car. What happens? At the Sklifassovsky hospital for first aid (700 beds) a doctor is always waiting at the telephone. As soon as he is satisfied that the need is urgent he will order an ambulance either from the hospital or from one of four other stations in the city. On

the instrument beside him five signals will record the execution of his order: the first light warns the others that a doctor, or his assistants, and the chauffeur have gone to the car; the fifth (from the watchman at the gate) that the ambulance has actually left. A dial shows the passage of time from the moment of order; the total is usually about 1½ minutes. At the hospital itself 13 ambulances are always on call, each carrying a doctor, an assistant doctor with three years' training, and a relatively unskilled helper. The average number of calls is 160-170 a day, and as the work is professionally uninteresting it is divided among 70 doctors who take duty for 24 hours at a time so as to be free for hospital practice 4 days a week. The telephonist works a 4 hour shift and assistant doctor a 8-hour day with every fourth day free. At night there is always a psychiatrist at hand to go out with an ambulance.

On arriving at the hospital the patient, if his skin is broken, gets an injection of anti-tetanus serum, he then passes into the care of the internal staff, among whom a surgeon, a gynaecologist, a radiologist, and a general physician are always on duty. Sets of instruments required for various operations stand ready for use. Tetanus never develops; the hospital has a record of 32 heart wounds successfully sutured; and among 230 cases of perforated ulcer admitted last year the fatality-rate was only 8 per cent.

I give these details of a particular hospital because they illustrate some of the advantages of a central medical organisation. In the first

place the Moscow ambulance do not (as lately in London) feel obliged to set down their freight inside borough boundaries. Secondly, means have been found to staff them with doctors rather than orderlies. Thirdly they bring the patient—unless he is too ill to travel far—to a hospital which is eager to treat him without a minute's delay—a hospital where specialists are on duty and operating theatres prepared. If we have nothing to learn from this well and good. But to me it seems a suitable example of the way in which Russian medicine, starting with certain administrative advantages, has been able to make better use, in some directions, of knowledge we all possess. Medical training and skill and equipment may not be specially good in the Soviet Union, but the authorities are making unparalleled efforts to apply them immediately and effectively. The new State cannot afford unnecessary invalids, and money is not grudged if it will help the citizen to be healthy or will reduce his disability.

The outlook, as might be supposed, is primarily preventive.

BEGINNING AT THE BEGINNING

In Moscow and elsewhere (before being run over) the visitor will notice huge pictures showing Stalin at the centre of a group of cheerful children. Boys and girls in the Soviet Union to-day are expected to be grateful to Comrade Stalin for the fact that they live in the country that is best in the world for children.

This propaganda is founded on fact. Rich or poor, legitimate or

illegitimate, the Russian child has unusual care and unusual equality of rights and opportunities. The Soviet Union is a country of young people—40 per cent, of the population have been born since the revolution of 1917—and the object of the government is to mitigate for children and adolescents the effects of shortage, especially shortage of houses and labour. One result of this is the astounding development of creches: if the Russian mother is encouraged to work at a factory she is also given a chance to leave her family in good hands during working hours. The creche system, it is argued, is no more natural than the employment of nursemaids; the children are the better for a social life and the parents enjoy them more if they do not have to contend with them all day. So there are creches at factories, creches at railway stations, creches on trains.

What is less familiar, perhaps is the use made of open spaces in the cities. The Russian "Parks of culture and rest" are far more amusing and pleasing than their name implies, but nothing even in the Moscow park is half so good as its "Children's townlet" where hundreds of children spend long days of summer. Here are all manner of games and entertainments: when the child is tired of climbing or dancing and of combats on rotating wooden horses he may try his hand at sculpture or painting, or learn how to make model aeroplanes and lifts and engines, or go for a shower bath, or a row in the lake, or up the hill to the biology house to play with the rabbits or play in the garden. I do not know how this place is run, but I do know that it is essentially

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right for city children. Nor should one despise the smaller play centres in smaller parks or smaller towns where parents sit peacefully watching their offspring's feats on climbing frame, wooden roller, rocking-boat, steps, bars, and other aid to dangerous life. And for the winter there are buildings like the vast palace of the Pioneers in Kharkov, where all can enjoy the advantages from playrooms to laboratories—which few can afford for themselves alone.

REPAIRS UNDER STEAM

More specifically medical are the day sanatoriums (sometimes called preventorium) for children who need special care. The one I saw at Kharkov occupied part of a large fir wood which is one of the city parks. Every early summer morning except on rest days you may see 600 children, aged 7-14 arrive in reserved tramcars to spend the day under medical auspices, and during the four months' season, which covers the school holidays of two and a half months, about 2,000 go through the woodland regimen. Some are sent, some are paid for, by their parents; they usually stay 30 days; others come from dispensaries and clinics and stay forty. Mostly they are "run down" convalescent or nervous, but some are admitted because they are exposed at some time to tuberculous infection. The medical staff consists of two doctors and four dentists, working under a half time medical director; like the teaching staff they are employed in schools during the rest of the year. No special treatment are adopted and even sun bathing has been abandoned; but the aver-

age gain in weight is 6½ lb. in 40 days. This is how it is arranged:—

The children arriving from 7-30 a. m. are met at the gate by a doctor who looks for sore throat and other infection. Each has a bag in which he puts his home clothes, and by 8-30 all are ready for physical exercises, a wash, and breakfast *e.g.*, bread and butter, marconi, cheese and milk. (Some have already had food at home). After an hour's rest they go to a medieval wooden fortress for showers (warm at first) and then have lessons in little shelters. Lunch at 1 p. m. (borach, cutlets, potatoes and raspberries) is followed by a couple of hours rest out of doors. At 5 p. m. there is milk and a bite. And then there are organised games for an hour. Once in the five day week is a cinema show, and sometimes there is a concert. Some of the children learn drawing, while others make mechanical models; as I left a visiting musician was waiting under the trees with his accordion. At supper there is, may be, a cereal with jam or fruit; the total milk intake is two or three glasses a day. At 7 the boys and girls go marching off to the trams, singing as they go.

SANATORIUM AND HOSPITAL

Closer to English types was another sanatorium in a pine wood a few miles out of Kiev, where tuberculous, pre-tuberculous, and nervous, children of 2 to 7 spend two or three months at a time, alike in summer and winter. What was particularly impressive was the way the institutional atmosphere has been combated. Small aquariums, like statues of Lenin, are a common place of

clinics in Russia. But here the fish were only one of many means of making the child take to his new environment and of keeping him happy. Parents are not allowed as visitors because their arrival upsets the child's equanimity. But "We are able to show them photographs of their children almost every week". A similar thoughtfulness was displayed at the smallish hospital at Kiev to which I was taken by the chief medical officer of the city. By every bed side was (1) a bell for summoning assistance; (2) a light to show that the bell had been rung; (3) a point for electric light; (4) a point for telephone; and (5) a point for wireless earphones.

AFTER THE CHILD— THE WORKER

I shall attempt no description of the remarkable development of resthouses, holiday camps, and health resorts throughout the Soviet Union, nor of the spread of physical culture and athletics. Enough has been said to show that both preventive and reparative measures are thought exceedingly important. Something must, however, be added about one of the most vital links between preventive and clinical medicine in Russia—namely, the factory clinic.

On visiting the 'medical station' of a comparatively small factory (1,500 employees) I was surprised to find a substantial house with several consulting rooms and facilities for specialised work such as dentistry and gynaecology. First aid and simple treatment are obvious tasks of such a clinic. But equally essential is its duty to ensure that each

employee is working under the best conditions that can be obtained for him. The factory medical officer must know the constitution—mental and physical of all in his charge. He must also know the work and work rooms of the factory and he must make arrangements to prevent human breakdowns just as the engineer prevents mechanical breakdowns. All this is especially difficult at a time when an increased tempo of production, with its inducement to overwork, is perpetually demanded; the Soviet Union presents the somewhat contradictory characteristic of a Utopia in the making and of a workshop where each must do his damnest to increase the national wealth. An interesting instance of compromise between these two tendencies is the institution called a night sanatorium, where people in poor health can live for a time in really good surroundings, with appropriate meals, fresh air, and freedom from worry, while performing their ordinary work during the day.

In Russian cities new houses—chiefly in large blocks of apartments, are springing up everywhere; but their benefits are largely offset by rapid increase of population and it is scarcely denied that living conditions are very generally deplorable. It is satisfactory at least to find that lessons have been learnt about the dangers of erecting new factories without providing houses, shops, creches, and transport in advance. I happened to see some dormitories put for unmarried workers whose homes were far away and they were adequate for their purpose—probably much better than the homes themselves. An example of workers'

housing which most travellers to the U. S. R. have a chance of seeing is the crews' accommodation on Soviet ships, which is very good compared with crews' quarters on most English ships.

We have seen that the factory worker is served by his 'Medical Station' and I might have added that his dependents are served by Special clinics in the neighbourhood. It remains to consider what medical arrangements are made for the public at large.

THE HEALTH CENTRE

Contrary to what is usually supposed, the Soviet regime encourages multiformity; many different routes are tried for reaching similar objectives, and local authorities enjoy great liberty of method. The central point of urban medical practice is generally a large out patient hospital or polyclinic. The following description is based on four such institutions I have visited one in Leningrad, one in Moscow and two in the Ukrainian Republic, Kharkov and Kiev.

The polyclinic itself may be a very large building or quite a small one. It might be called a polyclinic; or a general dispensary or to emphasise its preventive functions a prophylactorium. It may derive its funds purely from the city or partly from the Republic or from 'Social insurance'. It may have no beds at all; it may have beds for the treatment during the day (e.g., an anthelmintic ward at Leningrad); or it may provide beds enabling certain types of cases to benefit from particular facilities. Thus in the magnificent Third Polyclinic at

Kharkov there were no less than 280 beds used (1) for purpose of diagnosis, (2) for patients requiring physiotherapy, (3) for tuberculosis, and (4) for venereal disease. The number of the staff varies accordingly.

In Leningrad with 4,000 attendance daily, it was 40 (25 doctors). In Moscow with more than a million attendances a year it was 600 (200 doctors). While in Kharkov, with 5,000 daily attendances—it was no less than 1,200 (320 doctors). The Kiev polyclinic, one of many in the city, was relatively small, having a total staff of only 170. The number of attendances must not be taken as a measure of sickness incidence, for their object is often preventive—e.g., visits to the maternity and child welfare departments.

The area served by one of these institutions, which may have as many as 80,000 inhabitants, is divided geographically into smaller districts containing probably 3,000—5,000 persons. These are the units of what we may call family medical practice, for each of them is in charge of a therapist or general practitioner, working from the polyclinic with the assistance of one or more nurse (separate arrangements are made for young children, and in Kharkov there is actually a pediatrican for every district). These state paid practitioners work a 5½-6 hour day, probably with every 5th day free for 2 or 3 hours, they see patients at the polyclinic, and the rest of the time is spent on rounds. Any person arriving at the polyclinic without a particular recommendation will first be given an

appointment with his own district doctor, who has notes of all cases in his charge. If necessary he will then be sent to a special department for investigation or treatment, or to one of the diagnostic services of the clinic.

How far these departments and services are adequate is irrelevant to our judgment of the scheme itself; but in all the three large institutions I found astonishingly fine equipment especially for pathological work and physical treatment. (In Kharkov, besides innumerable douches, baths, and electrical devices, there was a gym, clinic for the obese and three large rooms for inhalation therapy including a dozen machines or so for menthol-and-paraffin inhalation in coryza.) The general scope of the work is indicated by the fact that the Lenin polyclinic employs among other specialists 500 oculists 9 surgeons, 5 ear, nose, and throat surgeons, 24 dentists, 4 gynaecologists, and 5 radiologists. All these are seen (save in emergency) by appointment; and in Kiev, where I was able to test the appointments system at work, I found it fully justified its author's pride. There was no more question, no more muddle; everyone's convenience was studied. Indeed as I went round these polyclinics, with their suitably associated departments their faintly informal atmosphere, their buffets, and their bookstalls, I was impressed again and again by the common sense of the arrangements.

This also applies to the scheme of the district service. We have seen our family doctor work for 3 or 4 hours daily at the polyclinic interviewing patients from his area the

rest of his working day being devoted to those unable to attend for advice. No car is available for his rounds, but the distance covered is by no means great; at the Moscow general dispensary, for e.g. it is not more than a kilometer or 12 mins. walk. His Medical assistant or his nurse fulfils the functions of health visitor—persuading, inoculating, discovering sources of danger. When in difficulties he has the whole machinery of the polyclinic behind him, with specialists ready to go out for consultation. When he is off duty there are deputies provided in his place. And when his patients should be treated at home, or dislikes the thought of hospital he can send for a nurse, linen, food, and whatever he needs to provide the best conditions for recovery.

"But does this really happen"? You ask. "Is there no pressure on the people to go to hospital"? I cannot say. In Leningrad I was assured that there was no pressure apart from cases of infectious disease and the dispatch of food and bedding seem to be part of the normal routine.

Any judgment on the wisdom of the above plan of medical practice must be based on a realisation that it is all offered free: the only charge made is for bottles of medicine to be taken home. From the English point of view, however, the system has the flaw that it does not seem to allow free choice of the doctor. If the patient does not like his doctor, can he change?—"Always the same question from you English" said the interpreter wearily.

I will summarise the answers I was given. In Leningrad, on pres-

sing the point, I was told that a patient who disliked the doctor in charge of his district could arrange to be attended in future by another doctor from another area. (But I doubt if this often happens). At the Moscow polyclinic a preference of this kind would have no weight unless the patient could *prove* something against the doctor, in which case the latter might be reprimanded or even transferred. In Kharkov the patient must accept the service he is given, but he has the alternative of paying a small fee for medical attendance provided by the Red Cross. Only in Kiev had the patient's wishes been thought as important as we think them in England, and here the director of medical services was able to inform me that everyone is now allowed to ask the help of any doctor on the district staff of the polyclinic. The new plan, established in the face of central opposition has been in force two months, and I fancy it was made feasible only by the comparatively small size of the areas served by each of the polyclinics.

MEDICINE FOR THE PEASANT.

In the countryside of Russia, as in the countryside of England, choice of doctor can rarely be attained, and in the vast agricultural dominions of the Soviet Union the medical service, though improving must often fall far short of intentions. During my own short stay in Russia I came into touch with it only at one point, in the Ukraine, where I paid an unheralded visit to a village hospital serving the peasants of three collective farms. This was an unexpectedly large institution, resembling a cottage hospital, staffed

by a resident doctor, a dentist, and three assistant doctors—we should probably call them trained nurses. All the women of the villages were admitted for delivery of their babies, and the district medical officer (not a resident) used it as a base for his domiciliary service, as I saw by his files of case histories. Patients needing specialist advice could go to a neighbouring polyclinic or to Kharkov; and, since roads are bumpy, ambulance carriages are provided on the railway that runs beside the hospital. Less surprising is the increasing use of ambulance aeroplanes to supplement rural services: several of these lay in readiness at the Moscow aerodrome, and it is said that no less than 80, designed purely for medical purposes, are kept in Moscow for transport of doctors and material to distant towns and villages. Whether it be literally or metaphorically, the flying squad is an integral part of medical organisation in a country where local efforts often need reinforcement.

This rural hospital may have been far from typical, and the same may be true of all the institutions I have been able to explore. It is likely enough that the Soviet authorities, though they seem remarkably ready to accept criticism, do not always abvertise their failures. Even a little knowledge, however, will dispose of the theory that the achievements of Modern Russia are just a facade erected to impress tourists. In medicine, as in engineering, they are part of a vast effort to improve the national life—an effort which bears all the marks of intense sincerity.

(*Lancet*.)

Extracts from the Annual report for 1934 of the Chemical Examiner's Department, Madras.

HUMAN POISONING CASES.

The total number of human poisoning cases investigated during the year was 327 with 1,995 articles as against 372 cases with 2,116 articles in the year 1933. Poison was detected in 174 cases (53.2 per cent).

Oleander heads the list with 41 cases, opium or its alkaloids come next with 24 cases, closely followed by datura or a mydriatic alkaloid with 23 cases. There has been a surprisingly large increase in the datura cases.

The following cases are selected as of interest.

Mercury.—(1) A man was suspicious of his wife's conduct and there had been frequent quarrels between them. One evening on returning from work he found his wife absent from home. He went in search of her, found her and asked her to return home to serve him food but she refused. As he was hungry he went home and began to eat the food that had been prepared by his wife early in the evening. The food had a queer taste and suspecting that his wife might have poisoned the food, he reported the matter to the village magistrate. The food was forwarded to us and we found in it about $17\frac{1}{2}$ grains of corrosive sublimate.

(2) A man was given poisoned milk and he died four days later. In the visceral matter only very minute quantities of mercury were found whereas in the vomit that had been collected there was 25 grains of corrosive sublimate.

(3) A man aged 40 years was arrested and escorted by the Police from Palni to Melur. On the way his escort allowed him to drink coffee at a hotel after which he had severe abdominal cramps and vomiting. He was admitted in hospital where he died about a fortnight later. Before his death he confessed to having swallowed perchloride of mercury at the coffee hotel. In this case we found extremely minute quantities of mercury in the visceral matter but one of the vomits sent to us showed about 1.16th grains of corrosive sublimate.

(4) In two cases in each of which death was very rapid we found large quantities of corrosive sublimate in the viscera—30 grains in one case and 50 grains in the other.

It is interesting that in fatal case of mercuric chloride poisoning, if the victim lives for some time after taking the poison, only very small amounts are still to be found in the viscera.

Arsenic.—In a case suspected to be one of food poisoning four per-

sons developed violent vomitings and purgings within half an hour after eating rice and curry prepared from brinjals and beef. One of the victims aged about 12 years died in the hospital that night. On enquiry it was alleged that foreign material had fallen into the curry from the roof of the kitchen before the curry was served. We found minute quantities of arsenic in the viscera of the child and also in the remnants of the rice, curry and chutney. The suspected foreign material was also sent to us for examination. It was found to be muscle tissue. Since this was stated to have fallen from the roof we wanted to find out if it was uncooked meat. We sent a portion of the tissue to the Imperial Serologist, Calcutta, to help us to find out the origin of the tissue. He reported that the tissue was disintegrated and its origin could not not be determined. We detected minute quantities of arsenic in the tissue and we could not see any difference between it and the rest of the cooked beef. It is therefore doubtful if the story that the tissue fell from the roof is true.

Copper.—There were four cases of poisoning by copper sulphate all suicidal, two of which proved fatal:—

(1) A man attempted to commit suicide by swallowing copper sulphate. He was removed to hospital. In his stomach contents we detected copper equivalent to about a quarter grain of crystalline copper sulphate. The man recovered.

(2) In another case a woman who, as a remedy for abdominal pains, took some blue stone in butter milk, was removed to the hospital in a

collapsed condition. From one of the vomits preserved we obtained copper equivalent to about two grains of crystalline copper sulphate. She recovered.

(3) A man aged 25 unable to bear pain in the abdomen swallowed copper sulphate to put an end to himself. He was removed to hospital at 7 p. m. and died at 4 a. m. the next morning. We found in his viscera copper equivalent to about 25 grains of crystalline copper sulphate.

(4) In another case a young man aged 19, a student in a college swallowed some copper sulphate from the laboratory. He died the same day. We found in his viscera copper equivalent to about 25 grains of crystalline copper sulphate.

The post-mortem appearances of poisoning by copper sulphate are worthy of note. In each of the above two fatal cases rigor mortis was present at the post-mortem examination. The features were pinched and the pupils were semi-dilated. The pericardium contained some serous fluid. The right side of the heart was full and the left side was empty. The pulmonary vessels were engorged and both lungs showed intense congestion. There was also congestion of the liver, the gall bladder being half full. There was also intense inflammation of the stomach, the mucous membrane being corroded in places with patches of haemorrhage and necrosis. The intestines were intensely inflamed. The gastro-intestinal tract was stained blue in numerous places. The brain and the dura were also congested.

Powdered glass.—A servant boy at the instigation of some persons wanted to kill the inmates of the house where he was serving and to this end while the milk was boiling, put powdered glass into it. A little later, a portion of the milk was used to feed the baby and while the rest of the milk was being poured into another vessel particles of glass were found at the bottom. The child did not suffer from any symptoms probably because the glass powder had settled at the bottom of the milk. The stone used for powdering the glass, a coconut shell in which the powder was conveyed to the house, the vessel with the milk and some powder collected from the place where it had been originally pounded, were sent to us and we found powdered glass in each of the items.

Barbituric acid.—A woman aged 30 was brought to the hospital with a history that she had swallowed some seven or eight tablets of soneryl. She was drowsy, not answering questions; her pupils were slightly contracted equal and reacted to light. The conjunctival reflex was present. The pulse rate was 115 per minute, regular and of fair volume and tension. The respirations were 23 per minute and regular. In the stomach wash sent to us we detected a derivative of barbituric acid. The woman recovered.

Aconitine.—(1) Three children were given a decoction of some root with coster oil. They became restless and developed tingling of lips and tongue, burning sensation in the stomach with numbness in the body and inability to walk. Two

of them died. From the stomach of one of the victims we obtained aconitine but could not find any in the stomach of the other. There is little doubt that both died of aconite poisoning. Our inability to find it is noteworthy as showing how difficult it may be to find it in the stomach even when the patient has been poisoned by it.

(2) There was a case of ordeal by poison. A gold necklace was lost in a house. A man who was said to be an adept in the occult arts was brought by the owner to trace out the culprit. Ten possible suspects were assembled and each of them was given something to chew in betel leaves. One of them, had vomitings and purgings but recovered in hospital. Some pieces of root were sent to us in connexion with this case and we identified the root to be aconite root.

Strychnine.—A man died suddenly with "epileptic fits" and it was only because the inmates of the house were his enemies that the viscera were forwarded to us. We detected strychnine in the viscera.

Picrotoxin.—A woman was found at bed time to be suffering from pain in the stomach with vomiting and convulsions. She died at about 4 a. m. the next morning. The viscera were sent to us but we had no information as to the nature of the poison swallowed. We obtained from the viscera an acid ether extract which (1) was crystalline, (2) reduced Fehling's solution, (3) killed a frog with convulsions, (4) gave a brick red colour on treatment with potassium nitrate and

concentrated sulphuric acid followed by addition of solid potassium hydroxide, and (5) gave a bright red colour on treatment with a solution of benzaldehyde in absolute alcohol followed by the addition of concentrated sulphuric acid. We did not obtain any alkaloid from the viscera. We therefore concluded that the acid ether extract we had obtained was picrotoxin, the active principle of *cocculus indicus*.

Eucalyptus Oil.—(1) a man fell down accidentally on the ground and feeling giddy as a result of the fall is stated to have taken as a remedy about one ounce of eucalyptus oil. About an hour later he was taken to hospital with severe pain in the stomach and nausea. His pulse rate was 116 and respirations 28 per minute. The stomach wash sent to us showed the presence of eucalyptus oil. The man recovered.

(2) In another case death was attributed to swallowing a few drops of eucalyptus oil on sugar. The post-mortem report stated that death was due to acute influenzal pneumonia. We did not detect eucalyptus oil or other poison in the viscera.

Eucalyptus oil in this country does not seem to be such a poisonous substance as in England—possibly due to adulteration.

Cannabis Indica.—(1) In one case a father is suspected to have poisoned his son owing to enmity between them. There were no definite post-mortem signs as to the cause of death as the body was decomposed. The suspected poison—a powder—was also sent. The suspected poison was found to be

the powdered leaf of Indian hemp and we obtained from the stomach a poisonous extract which gave a positive Beam's test with alcoholic HCl. The other Beam's test, viz, the formation of a purple colour on addition of alcoholic potash to a petroleum ether extract of the substance and evaporation at room temperature, was negative and this test does not work satisfactorily in our hands even with some known specimens of Indian hemp leaf. We were however not absolutely certain of the presence of Indian hemp as we could not get any sediment resembling Indian hemp under the microscope. There have been fatal cases of poisoning by Indian hemp both accidental and suicidal and cases have also been reported where the drug appears to have been used for the purpose of facilitating the commission of an offence, but this is the first fatal homicidal case.

(2) In another case an attempt was made to poison a man with some powdered leaves. The powdered leaves were sent to us and we found them to be Indian hemp. In this case the identification was made by the microscope—the powdered leaves themselves being present. The microscopic appearance of the leaves is very characteristic.

Madar juice.—There were two cases of death from drinking madar juice. From the viscera of each of the two cases we obtained the reactions of madar juice as described in my Annual Report for 1933.

As the post-mortem appearances with this poison have been but little described we give them in detail.

(1) In the first case (of a woman aged 25) the post-mortem signs were as follows:—The eyes were closed. There was discharge of blood from the nostrils. The left side of the heart was empty and the right side contained a small quantity of blood. Both the lungs were congested, red in colour and of soft consistency. The liver was normal with the gall bladder empty. The spleen and the kidneys did not show any marked signs. The stomach was distended, the lesser curvature being congested and contained four ounces of a brown liquid. There were no appreciable signs in the intestines. The uterus was normal and the bladder empty. The brain substance was softened duo to decomposition.

(2) In the second case (of a man aged 65) the body was decomposed but the following signs were present:—There was no discharge from the nostrils of mouth. The pleura was adherent on the left side and also at the base of the right lung. This is presumably an old scar. The pericardial cavity contained $2\frac{1}{2}$ ounces of red fluid. There was clotted blood in the right side of the heart and the left side was empty. The heart was dilated. The lungs were grey and friable. The liver, spleen and kidneys were normal. The outer surface of the stomach was congested. The intestines were decomposed. The membranes of the brain were vascular and the surface of the brain was reddish in colour.

Gloriosa superba.—A man aged 45 was found with violent gastro intestinal symptoms in the morning and when questioned by his neighbours, stated that he had eaten the

root of *gloriosa superba* in order to commit suicide. He died between 4 p. m. and 6 p. m. the same day. At the post mortem examination the body was somewhat decomposed. The eyes were half open and there was forthy blood-stained fluid from mouth and nose. The features were relaxed. The heart was dark red, the right side of the heart containing dark fluid blood mixed with clots and the left side only a few clots. The lungs were soft, dark blue and congested. The pleura was also congested. The peritonium was injected. The liver was dark red and congested and the gall bladder contained about a quarter ounce of thick bile. The spleen was dark blue and soft. The kidney was dark red and congested. The mucous membrane of the stomach was slightly injected and there were about two ounces of thick greyish white liquid mixed with small bits of some white vegetable inside the stomach. The intestines were slightly injected. The bladder contained half an ounce of reddish urine. The membranes of the brain were congested and the brain substance was soft and congested. The viscera were sent to us. We obtained from them a poisonous extract similar to that from *gloriosa superba* (*vide* analytical notes).

"*Karu Veerathalai*" leaves (*Elaeodendron glaucum*, *Pers.*).—We received last year a case of poisoning by drinking a decoction of the leaves of the plant. The symptoms were not stated. At the post-mortem examination the heart cavities were found to be empty. The lungs were soft and slate coloured; the stomach and intestines were congested with a thick

yellow liquid in the latter, and the membranes of the brain were vascular. We obtained from the stomach a poisonous resin similar to the poisonous extract obtained from the leaves and bark of *Elaeodendron glaucum*. This plant is a shrub occurring in the hotter parts of India. In Watts Dictionary of the Economic products of India it is stated that the root is a "specific" against snake bite (whether internally or externally it is not stated). The bark is stated to be used in native medicine and to be a virulent poison. The leaves are said to be used as a fumigant to rouse women from hysterical fits. The leaves and bark were examined in this laboratory and both yielded a poisonous resin which gave in chloroformic solution with acetic anhydride and sulphuric acid a green colour (Lieberman reaction). The resin was found to be freely soluble in chloroform and sparingly soluble in ether and in petroleum spirit.

"*Jammi leaves*" (*Prosopis Spicigera L.*).—Some leaves were received said to have been used in a suspected poisoning case but we did not however detect poison in the viscera. The leaves examined here gave a poisonous acid ether extract which did not give the Lieberman reaction for resin. It gave a brown colour when dissolved in acetic acid containing ferric sulphate and floated on sulphuric acid containing a trace of iron (Keller's reaction). The extract did not reduce Fehling's solution. The leaves were identified by the Agricultural Botanist, Coimbatore, to be those of *Prosopis Spicigera L.*

We have had a much larger number than usual of *datura* cases.

Datura.—(1) Three persons, two men and one woman were stated to be possessed by evil spirits. They followed two magicians to the burial-ground on a certain night so that the evil spirits might be cast out. There a *puja* was performed and each of the three was given mashed plaintains to eat three times. All the three felt a mixed sweet and bitter taste in the fruit and after they finished eating felt giddiness and dryness of throat. All the three persons became unconscious. The magicians disappeared and with them disappeared also the jewels worn by the woman. The vomits and the excreta of the persons as well as the remnants of the fruit were sent to us and we found a mydriatic alkaloid in each of them.

(2) A man contracted intimacy with a woman who was living with her two children and her mother. He wanted the woman to leave her mother and the two children and to accompany him to another village. She refused to comply with his request. The man thereafter mixed some poison in the food eaten by the woman's two children and her mother. The three of them became giddy and unconscious. The elder of the two children died the same evening. We found a mydriatic alkaloid in the viscera of the dead child and the suspected poison forwarded to us was found to be *datura* seeds.

(3) A family of three, husband, wife and son, were treated by some one for 'general debility'. They were given some medicine to be taken twice a day, one dose in the morning and another before bed time. The morning dose was con-

sumed by them without any ill-effect. Soon after consuming the evening does, however, all the three of them felt giddy and became unconscious. The next morning the neighbours found them still unconscious and the jewels of the wife were missing. The victims were removed to hospital. We found a mydriatic alkaloid in the stomach washings and in the urine of two of the victims.

(4) Two women, mother and daughter, were living in a house. One evening a hawker visited them and obtained permission to spend the night in their house. He gave the women some sweetmeats to eat. After eating the sweetmeats both the women became unconscious. The gold jewels worn by the daughter were missing the next morning and the hawker had disappeared. The remnants of the sweets were sent to us and we found a mydriatic alkaloid in them.

(5) A man was found associating under suspicious circumstances with coolies bound for Ceylon and Penang. He was arrested and on searching him a packet of powder was found on his person. We found the powder to be pounded datura seeds.

(6) A man went to a shandy in a neighbouring village and while returning home was accosted by two affable strangers who accompanied him and gave him something to eat. He became delirious and white in this state the strangers robbed him of his ear-rings by biting off both his ear lobes. The man was found without clothes in a semi-conscious condition in a jungle

the next morning. He was removed to hospital. We found a mydriatic alkaloid in his stomach washings.

(7) A quack undertook to cure a woman who was a lunatic. He gave her a paste of datura leaves to swallow. She became unconscious and died the same day. The body was buried by the relations. The story reached the authorities and the body was exhumed two days later. The viscera were sent to us and we found a mydriatic alkaloid in them.

(8) A family wanted to celebrate a festival and sent the servant boy to the market to fetch vegetables. The servant boy brought datura fruit which was prepared into a curry. Six persons including a child were stated to have made a feast of the curry. All of them began to vomit and the child became delirious. The child was taken to hospital for treatment. The stomach wash and a specimen of the fruit which was alleged to have been made into curry were sent to us. We identified the fruit to be datura fruit, but in the specimen of the stomach wash sent to us. We did not detect mydriatic alkaloid or other poison. It seems incredible that any one should make a meal of datura curry and survive.

Oleander.—Thirty-six of the forty-one cases in which oleander was detected were fatal ones. The symptoms of oleander poisoning so far as can be gathered from the histories furnished appear to be tingling of tongue, shivering of hands and feet and later of the whole body, epigastric pain, vomiting, in a few

cases purging, rapidity and failure of pulse, and asphyxial symptoms. In some cases convulsions also occurred. Unconsciousness set in only towards the end.

The post mortem notes revealed that in about half of the fatal cases the heart was contracted and all its chambers were empty. In about a third of the cases the right side of the heart was filled with dark blood and the left side of the heart was empty. In practically all the cases the lungs were congested. There was also congestion of liver, spleen, kidneys and brain in most of the cases and the stomach and intestines showed patches of congestion.

The cases we received were mostly suicidal and it seems as if oleander was taking the place of opium at the poison of choice for suicide.

Scorpion sting.—Cases of death from scorpion sting are very rare. What would appear to be a genuine case of death from scorpion sting occurred in the case of a man aged about 38 years who was stated to be apparently in good health. He was stung by a scorpion at about 3—30 p.m. and died in 10 minutes. The post mortem examination revealed not only evidences of heart failure but also the presence of caseating tubercles at the apex of the right lung. The scorpion that stung him was enclosed in a match box and forwarded to us along with the viscera. As we were not told in the letter of advice whether the scorpion sent to us was a live one or a dead one we opened the match box with due precautions only to find a dead scorpion. It was of ordinary size about two inches in length from the

head to the tip of the tail—not a specimen the sting of which could have been expected to prove fatal to a normal adult. We did not find any poison in the viscera.

ANIMAL POISONING CASES.

There were 20 cases with 70 articles, under this section. In nine cases poison was detected (45 per cent). Oleander was detected in five cases and arsenic in three cases. In one case the nature of poison could not be determined.

ANALYTICAL NOTES.

Mercury.—Many of the salts of mercury especially the halogen salts are very volatile. For example, mercuric chloride boils at 310°C, mercurous chloride at 384°C, mercuric bromide at 325°C, mercuric iodide at 354°C and mercurous iodide at 310°C. (*Reference:* Handbook of Chemistry and Physics by Hodgman). Dr Rajagopal Nayudu and Mr. Varadachar found no loss of mercury in the usual method of destruction of viscera by means of potassium chlorate and HCl, provided there was a large volume of water present and the heating was done slowly without charring or otherwise superheating the viscera. Mercuric sulphide precipitated from such solutions contained large amounts of sulphur precipitated with the mercuric sulphide. This sulphur was found to be difficult to remove even after several washings with carbon-disulphide and consequently the results tended to be high. If however the wet precipitate was dissolved in bromine water (in which it dissolves most readily) and the solution boiled to

drive off the excess of bromine, filtered and treated with washed H_2S gas, pure mercuric sulphide was obtained in quantitative amounts free from sulphur and could be filtered through a weighed gooch, dried and weighed. They verified that boiling dilute solutions of mercury to which bromine had been added did not result in any loss of mercury. So this method had been adopted in the routine examination of visceral matters for determination of mercury.

Further work is in progress with a view to determine mercury in visceral matters by distillation methods. The results will be published when completed.

Madar juice.—The sulphuric acid method of esterification of madar juice often yields a liquid whose odour is masked to a large extent by the odour of SO_2 , ether, etc. We found that the ester test for madar juice could be more conveniently done in the following manner:—The material rendered slightly alkaline and dried is extracted with alcohol and the alcoholic solution esterified by passing dry HCl through the alcoholic solution. Then a solution of KOH is added to neutralize the HCl while keeping the contents cool. If madar juice was present in the original material the liquid now exhibits a pleasant odour strongly resembling that of fresh ripe straw-berries. This test can be carried out even with small quantities in a test tube. If desired the neutralized solution can be distilled to obtain the ester or esters.

Palappudu.—The District Veterinary Officer, Trichinopoly, sent us a weed called 'Palappudu' which

was suspected to be poisonous to cattle. We extracted from this weed a poisonous alkaloid, the further nature of which is under investigation. The weed was identified by the Agricultural Botanist, Coimbatore, to be 'Lochnera Pusilla K. Schum.'

Gloriosa superba.—Dr. Rajagopal Nayudu found that by examining the root by the Stas-otto process neither the acid ether extract nor the alkali ether extract was fatal to frogs. On extracting the roots with rectified spirit under a soxhlet and adding ether to the alcoholic solution a whitish precipitate was obtained which on separation and injection into frogs proved fatal to them. The precipitate was freely soluble in water but insoluble in absolute alcohol, ether, chloroform or amyl alcohol. Yellow oleander seeds when treated in the same manner yielded a similar poisonous precipitate which however was soluble in absolute alcohol as well as in amyl alcohol. Further the precipitate from yellow oleander seeds yielded a blue colour on boiling with dilute HCl (*vide* my annual report for 1932). The precipitate from gloriosa superba did not yield any colour with HCl . Yellow oleander seeds in addition yields an acid ether extract poisonous to frogs and giving a purple colour with concentrated sulphuric acid. The poisonous extract from gloriosa superba obtained as above appears to be a glucoside. Its further nature is under investigation.

The microscopic examination of gloriosa superba root revealed: (1) An epidermal tissue of elongated cells.—In the interior of the cells

are found minute perfectly spherical bodies all nearly of the same size about three to four micromillimetres in diameter, many of them with crenated edges and radiating striae giving them a pretty appearance under the microscope. These curious bodies are not destroyed by boiling the tissue in water, in chloroform hydrate solution, or in HCl but appear to be soluble in KOH solution, and (2) a parenchymatous tissue of thin walled polygonal cells closely packed with starch grains. The starch grains consist mostly of ovoid grains and to a smaller extent of spherical, semi-spherical and semi-elliptical grains. There is a well-marked hilum in each grain and there are distinct concentric striations. The hilum is situated at the broader end of the ovoid grains at a distance of about a third of its diameter from the broader end. The average diameter of the majority of the grains is about 35 micromillimetres. There are however a few grains with diameters of 15 micromillimetres and some with diameters of 45 micromillimetres. In some of the spherical grains the hilum is in the centre of the grain. The starch grains of gloriosa superba differ from those of potato starch in the fact that in potato we find much larger grains 70 to 110 micromillimetres in diameter and the hilum in potato starch is found close to the narrow end of the grain. Spiral vessels and bast fibres were rather scarce.

STAIN CASES

Nine hundred and twenty-eight cases were examined under this heading. Eight hundred and eighty cases of blood-stains and 48 cases

seminal-stains with a total number of 4,747 articles in all. This number exceeds last year's record by 500 articles. Last year the number was the highest on record in this laboratory and the number of articles received this year sets up a new record. The number of articles examined in 1924 was 1,655 the largest number ever examined in a single year till then. Since then the work under this heading has trebled throwing a heavy strain on the staff. Blood was detected in 93 per cent of the cases examined and semen certainly or probably in 75 per cent of the cases. The Imperial Serologist, Calcutta, was sent 3,702 specimens and he reported as follows:—

3,480 specimens human blood;
186 specimens disintegrated
and source not determined;
15 specimens ruminant animal
blood;
17 specimen bird's blood;
1 specimen both human
and bird's blood;
1 specimen both ruminant
and bird's blood; and
2 specimens not blood-
stained.

3,702

In a case of rioting and murder one of the articles sent to us along with the blood-stained articles was a red powder resembling chilly powder. We were asked whether the powder was really chilly powder. We had no difficulty in identifying it to be chilly powder because apart from its irritating nature the powder showed under the microscope all the structures to be found in the

capsicum fruit Whether the powder was used as a weapon of attack in the rioting, is not stated in the history furnished.

MISCELLANEOUS MEDICO LEGAL CASES.

The number of miscellaneous medico-legal cases showed an increase this year (107 cases with 625 articles as against 95 cases and 524 articles in 1933). The articles consisted chiefly of bombs, poisons under the Poisons Act, bones for identification, and articles concerned in cheating cases.

The number of bomb cases this year shows a welcome falling off, viz., 29 cases as against 44 in 1933. the falling off was more marked towards the end of the year.

The following cases are selected as of interest :—

A woman while removing dung from a cattle shed was gored by a bull and died as a result of the injuries received. In one of the wounds a small wood like piece was found. The medical officer wanted to know whether the piece was wood or a portion of horn. Examined under the microscope the piece showed a structure similar to that of bark and not the scaly and structureless appearance of horn. Further the tissue was not stained, as horn would be, by picric acid but gave the reaction for lignin with phloroglucinol and HCl. We concluded it was a wooden piece probably bark.

A piece of 'rexine' cloth was suspected to have been stolen from a workshop. The workshop used a

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special quality of rexine exclusively manufactured for them and used only by them. A specimen of the stolen material and a specimen of 'rexine' cloth from the workshop were sent to us for examination to find out whether the two pieces were identical. The material of the fabric in each of the two pieces was found under the microscope to be cotton. The thickness of the two pieces was different and on examination under the quartz lamp, we found that the fluorescence exhibited by the coating on one specimen was quite distinct and different from the fluorescence exhibited by that on the other specimen. The two specimens were therefore not identical.

In a murder case by shooting the tissues round the wound were sent to us for examination for the presence of lead. We detected lead in the tissues showing that the wound had been caused by a leaden object probably a bullet.

In another case, a man was alleged to have been shot with a gun. There was an injury in the neck which might have been due to a gun shot wound. The gun, we were told, was loaded with country gunpowder and pebbles, no leaden bullet or shot having been used. The tissues around the wound were sent to us for examination to ascertain whether the wound was caused by gun shot. As an examination of the tissues for lead would have been of no use in this case, we digested portions of the tissues (1) in cold nitric acid and (2) in cold HCl + KC10. After the tissues dissolved a fine black deposit of carbon was seen at the bottom in

each case showing that carbon had been embedded in the tissues. Sections of the tissue examined under the microscope also showed black coloured foreign particles. The detection of elementary carbon imbedded in the tissues of the wound suggested that the tissues had been subject to the explosion of a black powder at close range.

GENERAL ANALYSES.

One hundred and seventy-one articles were examined under this heading comprising 32 articles under the Petroleum Act, and Explosives Act, two samples of sugar under the Sugar Excise Duty Act, three samples under the Food Adulteration Act, 88 articles for various miscellaneous Governments departments and 46 articles for private parties.

The following case under this heading is of interest :—

A man who claimed to have a specific for snake-bite made a demonstration of his specific before a medical officer. He made a cobra bite a goat and 'cured' the goat by the administration of his specific. As the medical officer desired to assure himself further, he pressed out some fluid from the fangs of the cobra and injected it into the goat for a second demonstration with what result it is not stated. Presumably the result was as before. As the fluid obtained by the medical officer was of pale white colour, the medical officer was not quite sure

whether the venom had not all been pressed out from the sac and removed before the demonstration. The test tube which contained the remainder of the fluid after injection was sent to us for examination as to whether it was real venom. The contents of the test tube were very minute in quality. They were dissolved in a small quantity of water and divided into two equal portions. One of these two portions injected into a frog weighing about five grammes, killed it in about 20 minutes. The other portion mixed with 2 c.c. of antivenin and injected into another frog of similar weight did not produce any harmful effect on it. The test tube evidently contained snake venom but in an extremely minute quantity.

Several cases requiring the identification of the machine on which a document had been typed were received and the method outlined in my previous report was used on them with conclusive results. We are indebted to the Commissioner of Police for lending us Sub-Inspector Thiruvengkatachari to help with the laborious measurements and calculations the method involves.

The identification of the weapon from which bullets and cartridge cases had been fired was required in several cases. In some of these cases we were able to prove by the usual methods that a bullet or cartridge case had been, or had not been, from a certain weapon.

Service News and Notes.

We have great pleasure in offering our heartfelt congratulations to Major-General E. W. C. Bradfield, I. M. S., on his appointment as Director-General of the I. M. S. We would have welcomed him even with greater pleasure as our Surgeon-General but he has been meant for higher offices. Our best wishes go with him on his assumption of his high appointment.

* * *

With great regret we have to say good-bye to three of our esteemed colleagues who are on the eve of their retirement from the service. Dr. Siva Rao Trasi, M. B. & C. M., has been for some years now the Professor of Midwifery at the Vizagapatam Medical College and the Superintendent of the King George Hospital, Vizagapatam. An able surgeon and obstetrician, an independent officer and a born administrator—all these he is and there is no doubt that his retirement has created a void which is rather difficult to fill. Dr. Hensman, we know puts his heart and soul into any work that he sets himself. His administration of the Mental hospital in this city, his wellknown sympathy for the unfortunate sufferers under his care and his unceasing efforts to increase the accommodation and amenities of the institution of which, for over 12 years, he has been head require no comment. Dr. Ramanujayya has done most of his service in the mofussil except for short spells in the city of Madras. He was for sometime the Superintendent

of the Royapetta hospital. To these three friends we reluctantly bid farewell. But they are not going away from us for although not one with us in active service they still continue to be members of the association and we are sure will evince in the future the same keen interest in the welfare of the service as in the past. We wish them a long holiday from their active labours, splendid health and may they draw their well earned pension for many years to come!

* * *

We welcome Dr. R. Annamalai L. M. S. S. A., who has been promoted civil assistant surgeon from the rank of sub-assistant surgeons. We extend to him our hearty invitation to join the association and strengthen it.

* * *

We regret to see a note in the 'Hindu' about the passing away of the son of Dr. Madhava Nayak, Assistant District Medical Officer of Mangalore. The boy was studying in the second year college class and fell ill recently. Since writing the above, we have received with great sorrow further news of the death of the daughter and son-in-law of Dr. Nayak, within a week of each other. The latter was a son of the late Dr. B. S. Mallaya. Our heartfelt sympathies go with the bereaved parents and we offer them our condolences in the name of the members of our service.

* * *

Service News and Notes

An At Home.

On the evening of Saturday, the 10th October, members of the Provincial Medical Service stationed in the City of Madras entertained Dr. H. S. Hensman, OBE, L.R.C.P., M.R.C.S., M.P.C., the retiring Superintendent of the Government Mental Hospital, Madras, at tea on the grounds of the Medical College. About one hundred members and guests were present. Dr. and Mrs. Hensman were first garlanded and a group photo was taken. After a pleasant time spent in having tea and conversazione. Lieut-Col. C. Newcomb, I.M.S., the acting Surgeon-general spoke in eulogistic terms of the services rendered by the chief guest of the evening to psychological medicine in the city of Madras and of his enthusiasm with regard to his work. Rao Bahadur Dr. T. S. Tirumurthi, followed, recalling his student days and his association with Dr. Hensman in those days and later while as post-graduates in England. After Dr. Hensman replied suitably the gathering dispersed.

Charak Memorial Prize.

It was announced in the June 1935 issue of the "Indian Journal

of Venereal Diseases" that a Prize of the value of Rs 100 will be given for best original thesis on "Antiquity of Syphilis (Venereal Diseases) in India." The thesis received were independently judged by a Committee of the following:— Lt.-Col. K. K. Chattarjea of Calcutta; and Dr. R. V. Rajam of Madras; Lt.-Col. Jelal M. Shah; Dr. P. V. Gharpure, and Dr. U. B. Narayanrao, of Bombay. The judges have by a majority decided that the Prize should be offered to **Dr. D. V. Subba Reddi, M.B.B.S.,** Medical Registrar, Medical College, Vizagapatam. We offer our hearty congratulations to the winner of the Prize. His thesis is published in a book form and can be obtained at the office of the above Journal at Re. 1-4-0.

A consolation prize of the value of Rs. 25 has also been awarded to Dr. H. S. Joshi, L.C.P.S., (Bom.) of Nasik, for his thesis, by the editor of this Journal.

(Burma Medical Times.)

May we hope that the Shroff Memorial Gold Medal, terms of the award of which are given elsewhere in this issue, will also be won by another member of our service.— [E.D.]

OBITUARY.

LORD MOYNIHAN, K. C., M.G., C.B.,

Late President of the Royal College of Surgeons of England.

The death occurred on September 7th at his house Carr Manor, Leeds of Lord Moynihan, after a brief illness. Lady Moynihan had died in the previous week and he was present at her funeral, but two days later on Saturday, September 5th he was taken seriously ill and he died without recovering consciousness from the seizure.

Berkeley George Andrew Moynihan was born in Malta in 1865, the son of Captain Andrew Moynihan, V. C., who gained the Victoria Cross in 1856 with remarkable gallantry while serving with the Light Infantry in the Crimea. The son was educated at the Royal Naval School, with idea of entering the Navy, but on a changed intention he went for his medical training to Leeds, with which city his name is fitly associated in his full title as a peer; and no finer training ground in the country for a young surgeon could have been found than Leeds in the eighties. The Leeds school of Medicine, later united with the Yorkshire College was one of the three constituent of the old Victoria University. The curriculum of the medical school was at that time arranged mainly to meet the requirements of the Royal College of Surgeons of England and the clinical work was done at the Leeds General Infirmary. The Infirmary had then an average of over 450 beds, and on the surgical side the

veterans Claudius Wheelhouse and Pridgin Teale were still consulting surgeons, while T. R. Jessop had more than a provincial reputation, and Mayo Robson and Littlewood were first class men. Moynihan's course as a student was a series of successes. He qualified with the English double diplomas in 1887, and in the same year graduated in medicine at the University of London. He took the degree of M. S. London, with the gold medal, and the diploma of F. R. C. S., Eng. in 1890, and acted as house surgeon to Mayo Robson. This appointment had a profound influence on his career. Robson was a very original surgeon and when Moynihan served under him in 1887 and 1888 Robson had already done notable work on the surgery of the biliary passages, the stomach, intestines, and pancreas. Moynihan at first followed his senior's lines, gathering as much or more from experience gained when aiding Robson in a large private practice as from the clinical work in the infirmary. He was, after a period of post-graduate study in Berlin, elected assistant surgeon to the institution and early showed both his skill and boldness as an operating surgeon and in particular a gift for writing with wonderful clearness and distinction on the important clinical subjects which he and Mayo Robson for some years made almost a field of their own.

Obituary

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As early as 1898 Moynihan published some ingenious suggestions for the technique of abdominal operations, and in 1901 he contributed to these columns admirable notes on the gastric and pancreatic operations; and during the next two years appeared practical text books, written in collaboration with Robson, on the operative procedure demanded in sequence to gastric and pancreatic disease. In both treatises the reasons for diagnosis were given with evidence of wide reading, and the choice of procedure—often a very bold one—was justified by clear description of the technique employed. The clue to the familiarity with scientific literature was furnished by separate communications from Moynihan, who had employed and was employing all his spare time in continental clinics, where he got into close professional touch with foreign leaders. Notes in these columns on deformity of the stomach following gastric ulcer, on the diagnosis and treatment of pancreatic calculi, and on retroperitoneal hernia showed both his learning and resourcefulness, and in 1903 was published a brief paper illustrating the wonderful opportunities with which a widening reputation was furnishing him. The paper showed that in the seven weeks from July 20th to September 10th, 1903, Moynihan performed 18 operations upon the stomach, 8 upon the gall bladder and bile-ducts, 13 upon the pelvic organs, and 5 upon the intestines. The operation in the gastric cases was usually gastro-enterostomy, performed to relieve the results of chronic ulcer; only one death occurred, that being a case of carcinoma. The operation on the gall-bladder and bile ducts was chole-cystectomy, and im-

mediate recovery followed in all except one, in which there were deposits throughout the liver. The operations upon the pelvic organs conducted for fibrous myoma and prolapse were all followed by recovery, and the same happy result followed the operations upon the intestines, but here the recoveries were less likely to be permanent as the condition was in four out of five cases held to be malignant. This was a very remarkable experience in abdominal surgery conducted over thirty years ago, and we can appreciate the solidity of Moynihan's future work when we take into account the quality of the early performances. His important text book "Abdominal operations" appeared in 1904 and ran through four editions. Though entitled Abdominal operations, only those operations were included which are common to the two sexes, and the surgery of the organs like the kidney and the bladder and various operations for hernia was omitted. The book was recognised on its appearance as extremely valuable and one which formed the originality and experience of its author would be of practical service to surgeons.

From his initial standpoint Moynihan never defaulted and while he gained world fame personally, the impulse of his life was the promotion of scientific surgery, and how far and how splendidly he succeeded is in evidence plain to all. He first founded a surgical club which in recent years has adopted his name as its own and was active in starting the Association of surgeons drawn from the teaching centres of the provinces and the club meets annually at a home town, and visits

annually a foreign clinic. Thus began a close and friendly communion of surgeons by which the ideals of surgery could be maintained and promulgated. Almost simultaneously the idea of founding the British Journal of surgery was conceived in Bristol, when Moynihan was secured as the leader of the movement, while open handed financial support was rendered from the beginning by Messrs. John Wright and Sons as publishers. What these activities have done for surgery received splendid expression at the Royal College of Surgeons of England in July last, when the resuscitated French Academy of Surgery was paying a visit to London at the invitation of the College. The two presidents, General Rouvillois and Sir Cuthbert Wallace, at a reception in the College, spoke of their common aim in the advancement of surgery, when occasion was taken to present Moynihan with a silver statuette in appreciation of his services to surgery. Prof. E. W. Hey Groves, in making the presentation, said that the committee of the British Journal of Surgery were using this opportunity to express their gratitude to Moynihan, first by erecting his portrait in the College, with a tablet "whose paucity of words (said the speaker) is the most eloquent way of admitting that we are incapable of describing the greatness of his services"; secondly, by presenting through him the sum of one thousand guineas to the College to be expended on some scheme of surgical research connected with his name; and thirdly, by the personal gift of the statuette. Moynihan in replying, spoke of the improvement of surgery and the advancement of research as the

preoccupations of his life. It was, he said, the lack of unity among surgeons that had led him to the thought of a catalyst in the form of a journal and then of an association. And now that he is gone we may well apply the word catalyst to the man himself, for without losing his own quality he was continuously the agent of change in others which led to the building up of surgical achievement and tradition. It was fitting that, on what was sadly turned out to be the closing public scene of his career, that the event should have taken place in the Royal College of Surgeons of England.

Moynihan's connexion with the college began officially in 1899 as an examiner for the fellowship, and Arris and Gale lecturer. In 1912, the year when he was knighted, he was elected to the council of the College and in 1920 delivered the Bradshaw lecture. In 1926 he was elected President, and in 1927 was Hunterian orator. In the oration he drew a fascinating parallel between Hunter and Lister, shown that neither is to be praised as the inventor of particular manoeuvres, but both must be revered in that they had opened up to the medicine a vista of victories. Moynihan was president for the unusual period of six years. The extension of term was a recognition not only of untiring official work but to the forward view which he took of the duty of the College in furtherance of its traditions. On surgical research Moynihan felt that the promotion of surgery which lay so close to his heart must be founded, and during his presidency a complete change was effected in the attitude of the College to research.

He was the brain that conceived and brought about a new spirit in its workrooms. He was determined that his College should do more than merely investigate-what he called "dead material" pathological states and made to introduce "vital" research into the laboratories of the Museum and College under former presidents, but all ended in failure because the council of the College of these times were averse from the introduction of vivisection into the laboratories under their immediate care. Moynihan ended all that by convincing his colleagues on the council that the College would never take its rightful place in the van of research until experiment on the living as well as examination of the dead was encouraged. He not only advocated opening the Museum laboratories to experiments on the living but led a movement which gave the Museum new laboratories and the equipment necessary to fit them for their purpose. He was the active missionary who went to the city of London and elsewhere to secure endowment for research scholarships in association with the College. He showed here his genius for getting things done; he never failed to carry through a scheme, once he had determined that the thing should be done. "Lord Moynihan's ambition," writes Sir Arthur Keith, "was to see the Hunterian ideals again restored-for experiment on the living was in Hunter's opinion at the base of all inquiries into surgical problems. He wanted the College to possess in the twentieth century what Hunter had built up in the eighteenth-a research farm in the country-an "Earl's Court," as Hunter's farm was called. It was just then that Sir Buckston Browne was seeking for the best

means of conferring on surgery his chosen profession-a lasting benefit. Between them there grew up the idea of an 'Earl's Court' only planted not in Middlesex but in Kent next door to Darwin's old home, and now known as the Buckston Browne Research Farm. The foundation stone was laid by Lord Moynihan in 1931, and the Farm has now been in operation for three years. In that time, under the direction of Dr. John Beattie, the Buckston Browne Farm has become noted throughout the world as a centre of surgical research, fulfilling the object which Sir Buckston Browne as well as Lord Moynihan had in view."

Devoted as he was to surgery, Lord Moynihan's interests in other directions were many and in whatever he was interested he took an enthusiastic part. He was a close student of medical history (classical, medieval, and modern), and investigated the evidence for the cause of death generally assigned to historical people like Napoleon and the murdered children of Edward IV. He had highly developed artistic tastes and was a collector of both books and pictures, and it was a tragedy that his collection should have suffered from an unfortunate fire in the house in Park-square, Leeds, where he lived for many years. He had a varied knowledge of the lives and performances of doctors who, to use his own words, became "truants to medicine," and in the Linacre lecture delivered at Cambridge last May he summarised this knowledge in an interesting and amusing manner (vide *The Lancet*, May 30th, 1936, p. 1254), proving his omnivorous reading and his faculty of close though generous criticism. He was interest-

ed in the promotion of athletics and was himself an enthusiastic swimmer. He was an advocate of the legislation of euthanasia and he had proposed to introduce a Bill in the House of Lords legalising the voluntary death of patients suffering from incurable and painful diseases. He travelled extensively, always with the promotion of surgery in view. He made himself an authority on such matters as the dissemination of tuberculosis by milk and the prevention of cancer by organised effort, and these things form but a selection of the subjects where he used his remarkable gift of lucid eloquence to promote the desired objectives. As a public speaker he had few equals. He was eloquent, clear, and witty, and his deliveries gained by his ability to speak without written notes, but memorising in a faultless manner the results of previous study of his subject.

Moynihan's war service were distinguished. At the outbreak of hostilities he was appointed consulting surgeon to the Northern Command. He served for two years with the British Expeditionary Force as consulting surgeon and later was

chairman, with the rank of Major General, A. M. S., of the council of consultants. He was made a C.B. in 1917 and a K.C.M.G. in the following year, and in 1922 received a baronetcy. In 1929 he was created Baron Moynihan of Leeds. Academic honours came to him in profusion. He was D.C.L. Oxford and Durham; L.L.D. of seven Universities, British and Canadian; he held honorary medical degrees from Universities in South America, Ireland, Belgium, and Egypt; he was a corresponding member of surgical association in France, Italy, and the United States.

Lord Moynihan married in 1895 Isabella Wellesley, daughter of the late Mr. T.R. Jessop, surgeon to the Leeds Infirmary, who died a week before her husband. They had two daughters and one son, the Hon. Patrick Moynihan, who succeeded to the peerage. There was a largely attended funeral service at Leeds Parish Church on September 10th, and a memorial service will be held at St. Martin-in-the-Fields, London, on Monday next, September 14th, at noon.—(*Lancet*)

NOTICE.

The next number of the Journal is due for publication about the 20th of January 1937. Matter for publication may be kindly sent to the editor before the 1st January 1937 at 'Nikko,' Theagarayanagar P.O.

The Secretary will greatly welcome the prompt payment of subscriptions, a good amount of which is still overdue as the year is coming to a close.

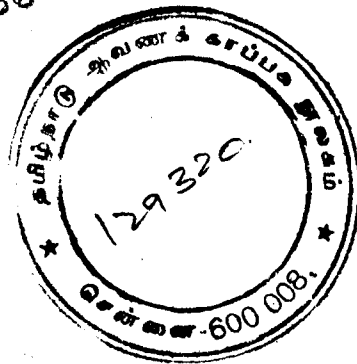
ACKNOWLEDGMENTS.

We acknowledge with thanks exchange copies of the following journals:—

The Indian Medical Journal, Sept., Oct. & Nov., 1936.

The Burma Medical Times, July & August, 1936.

[Ed.]



The Dr. B. S. Shroff Memorial Gold Medal

OF THE BOMBAY MEDICAL UNION

The following subject has been selected by the Bombay Medical Union for competitive thesis for the above Prize for 1937 :—

“The dietetic deficiencies and excesses at present prevalent in different parts of India, and their effects on health, with suggestions for improvements of such dietaries.”

The award will be in the form of a Gold Medal called the DR. B. S. SHROFF MEMORIAL GOLD MEDAL of the BOMBAY MEDICAL UNION.

The competitor must be (i) a duly qualified member of the Medical Profession holding a degree or degrees and diplomas from Indian and other Universities created by statute, or (ii) a duly qualified member of the Medical Profession holding the diploma of Membership of College of Physicians and Surgeons of Bombay.

The thesis must be sent in six typed copies so as to reach the Honorary Secretaries, Bombay Medical Union, Blavatsky Lodge Building, French Bridge, Chowpatty, Bombay, on or before the 15th March 1937 the latest.

The thesis should be designated by a motto instead of the writer's name and should be accompanied by a sealed cover containing the name of the writer and his Post-Office Address.

The name of the Prize, the year of competition, the subject of the thesis, and the writer's motto should be superscribed on the cover.

No study or essay that has been published in the medical press or elsewhere will be considered eligible for the Prize, and no contribution offered in one year will be accepted in any subsequent year unless it includes evidence of further work.

The accepted thesis shall be the property of the Bombay Medical Union.

All other thesis shall be returned if not accepted provided the returned postage expenses are paid in advance by the writer.

In the award of the Prize to the successful candidate, the decision of the Committee, shall be final.

SORAB J. POPAT,
M.B., B.S.

M. B. THAKORE,
M.B., F.R.C.S.

Hon. Secretaries,
BOMBAY MEDICAL UNION.

Bombay, 16th Oct. 1936.