Before you commit yourself to a practice, work 3 or 5 years in the R.A.F.

You'll do some interesting, out-of-the-rut medicine. see a bit of the world, and 'retire' with up to £3,000 in cash

3 things to think about:

1. You can take your first GP appointment after, rather than before, your first practical work as an out-ofhospital doctor. And there are good reasons why you should. After 3 or 5 years you'll know what sort of doctoring you like best, and do best; you'll know, if you're a round peg, what a square hole looks like.

2. If you don't see the world now . . . can you honestly put your hand on your heart and say you will do it later?

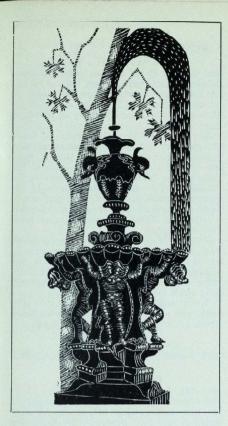
Ref.....

Are you in your pre-Registration year? Then here are 3. £3.000—what a wonderful start to a GP career! For full information please write giving your age and qualifications to Wing Commander D. G. M. Hills, M.B., B.S., D.P.H., R.A.F., Ministry of Defence (MAI) (LMA 142), 1-6 Tavistock Square, London WC1.



То	Bank Ltd.		
	branch (address of your bankers)		
Please pay to the National Provincial Bank Ltd.,	59, West Smithfield, E.C.1 branch, for the credit of		
shillingspence (amount in	the sum of £/s./dpounds words) on theday of		
	until this order is cancelled by me. If the date of		
this first payment shown here is past, please make the first payment on receipt of this order.			
This authority cancels all previous instructions.			
	(name and qualifications) (BLOCK CAPITALS)		
	(Please sign over a 2d. Stamp)		
	(address for Journal)		
	ild be returned to the Manager of the Journal.		

BANKER'S ORDER



CONTENTS

COLILETIAN				
Editorial				
VOX				
The Relief of				
T. B. Boult				
Further Reflec				
Women by				
Single, Double	or Grou	ip by	Dr. H.	M.
Weaver				
Whither Shall W	e Wand	der by	Jasper	
Some Contributi				
Radiotherap				
Around and Ab				шор
				1
The Oldest Ho				
N. J. M. K	erling			
The Waiting Roc	m by R	lodney	F. Crai	ndell
Fifty Years Ago				
Book Daviews				
Book Reviews Sports News			•••	

PUBLICATIONS COMMITTEE

Chairman: Dr. A. W. FRANKLIN

Deputy Chairman: Dr. G. H. FAIRLEY.

Editor: C. J. KELLY.

Review Sub-Editor: G. R. HAMILTON.

News Sub-Editor: M. A. P. S. DOWNHAM.

Social Sub-Editor: Miss J. BELL. Sports Sub-Editor: B. LASK.

Photographic Sub-Editor: B. C. P. LEE.

Manager: J. R. SWAIN.

Asst. Man. (Subscriptions): A. R. BAILEY.

Asst. Man. (Advertising): R. L. COOPER.

Nurses' Representative: Miss M. IRONSIDE.

EDITORIAL

The untroubled peace of midsummer life at Bart's has been disturbed recently by news from an unexpected quarter. This news concerned the wife of one of the clinical students at this Hospital. This lady had an appointment at an Out Patient Clinic at Bart's. She arrived in good time for the appointment and was taken to the clinic by her husband who introduced her to the sister in charge. The patient then waited two and a half hours before being seen. When finally she was seen she was examined by a student.

If we examine this case critically we can see that two principles are involved. The first is that no patient who has an appointment for a definite time at a clinic should be kept waiting for anything approaching two and a half hours. The second matter is whether or not the wife of a student ought to be examined by another

As to the first point, it has long been evident that the present Out Patient system is in need of an overhaul. Any monopoly system has the consumer at its mercy and is inclined to ignore to too great an extent, the convenience of any besides itself. An arrangement, such as the present one, which is capable of producing an error of two and a half hours must be revised. A system involving exact appointment times would be well nigh impossible to keep to strictly at a busy hospital; however, at the

moment it seems that too many patients are being given the same appointment time. From the Hospital's point of view this system allows for people who fail to turn up at all, but at the same time it penalises those who do take the time and trouble to come. It is only because patients can not, or will not, complain that nothing is done; bureaucracy has us all at its mercy.

As regards the second point, we do recognise, as stated in the Editorial of the July Journal, that participation by the student in the wards and clinics is the basis on which practical medical experience is built. On the other hand it has always been understood that at this Hospital members of the staff, nurses and fellow students are never examined by students. This courtesy has always been extended to include the wives and families of members of the staff. As this is the case it is surely only reasonable that students' wives should not be examined by students. In these days, when the number of married students is increasing. these incidents will grow more numerous and it would be as well to have this principle endorsed from an authoritative quarter as soon as possible.

No one deplores the encroachment of Christmas into the summer more than we do, but the end of the fifth test and the start of the soccer season reminds one of the inexorable approach of the festive season. We realise that many people will be horrified to see that this month, with summer holidays hardly over, we introduce our Christmas card. Nevertheless we know that many people do like to order their cards well in advance and it is for their greater convenience that we have decided to advertise the card rather earlier than usual. Could we persuade readers to order well in advance for their own convenience, for our convenience and for the convenience of the Post Master General, whoever he may be after October?

This year's card has been specially designed by Margaret Crowther and, although only good quality materials have been used for both card and envelopes, we have been able to keep the price at the very low cost of fourpence per card. The order form and design appear on

We extend our deepest sympathies to the relatives of David Kenyon, who died suddenly on 24th August.

Correspondence

INTERNATIONAL BONDS

Sir,—Several of the leading North American Medical Schools have adopted medical schools in lands less fortunate than their own: a good example of this is the University of Pennsylvania and the University of Shiraz in

Some of the Medical Schools in Great Britain have had a loose association with schools in the Commonwealth. Most of these are in Africa where the white man is less popular than he used to be. However in the Middle East, in spite of propaganda to the contrary, British prestige is high, particularly that of Medicine. Even at the American University in Beirut, Lebanon, they want more British contracts.

Perhaps the time has come when we should stop running ourselves down and proudly go and fly the flag of British medicine in less prosperous countries. Almost all the Universities in the Middle East teach in Englishonly one is in Arabic.

Bart's should take the lead and probably both staff and students would benefit. What about Isfahan in Iran or Mosul in Iraq?

Yours faithfully, Ian P. Todd

10th August. 149 Harley Street, W.1

HOLIDAY WORK

Sir,-May I use your columns to bring attention to certain bureaucratic bunglings at Bart's? As your correspondent Mr. R. E. Atkinson noted in your June issue, holidays during the Bacteriology and Pathology course are allocated and not chosen. The holiday fortnight this year coincided with some of the compulsory lectures in Practical Pharmacy which are recommended for students taking the above course. A little thought will show that few, if any, students are willing to attend compulsory lectures during their all too short vacation.

For obvious reasons Sir, I prefer to remain, Yours sincerely.

"Perplexed" Abernethian Room

11th August.

ETHICAL TEACHING

Sir,-There is always a sporadic correspondence in medical and lay publications, on "What to tell the patients".-I have been shocked a number of times by the apparent callousness of senior teaching staff in this Hospital. Words which the patients are not supposed to understand, are used over their beds; the prognoses of malignant disease are also discussed in great detail. When the patient-often in tears and obviously extremely upset, asks the sister for the full meaning of these discussions, he or she is reassured as much as is possible in the circumstances.

It seems, in these cases, as though the patient has not been told the full details and implications of his disease,—due perhaps to his emotional make-up or state of mind. Why then is his disease discussed so openly in front of him? Medical Textbooks and dictionaries are available in most Public Libraries;-I heard the word Carcinoma used (in explanation), on two television programmes in one evening, recently.

Many of us would like to see that all tutorials on the possibly fatal diseases, are discussed in a side room; after any physical signs and histories have been elicited at the bedside. The discussion of the less serious diseases over the patient is obviously good for him, as long as he is continually reassured that the use of medical terms does not have any serious implications.

Yours faithfully,

15th August.

R. L. Cooper Abernethian Room

Calendar SEPTEMBER

Sat. & Sun., 5th & 6th.

Dr. G. Hayward Mr. Badenoch Mr. Aston Mr. F. T. Evans Mr. Cope

Sat. & Sun., 12th & 13th.

Dr. A. W. Spence Mr. Tuckwell Mr. Burrows Dr. R. A. Bowen Mr. McNab Jones

Sat. & Sun., 19th & 20th.

Prof. Scowen Prof. Taylor Mr. Manning Mr. G. Ellis Mr. Hogg

Sat. & Sun., 26th & 27th.

Dr. Bodlev Scott Mr. Alan Hunt Mr. Aston Dr. R. W. Ballantine Mr. Fuller

Physician Accoucheur on Duty for the month of

September is Mr. J. Beattie.

Engagements

BUCKNILL-Fox.-The engagement is announced between Thomas Michael Bucknill and Jean Elizabeth Fox.

BOSTON-SYKES.-The engagement is announced between John Roger Boston and

Elizabeth Esther Sykes.

HARRIS-TOMPKINS.-The engagement is announced between Simon Hanis and Josephine Tompkins.

WHITEHOUSE-DE SAUSSURE.—The engagement is announced between Julian Michael Arthur Whitehouse and Diane de Saussure.

Marriages

LEAVER-CLARKE. On July 4, Peter Kenneth Leaver to Jane Margaret Clarke.

SAVEGE-FAWCETT.-On June 20th at Bowdon Parish Church, Dr. Peter Savege to Julia Fawcett.

Births

WATKINS. On July 18, to Gillian and Dr. David Watkins, a son (Roderick) brother for Anna Hugh and Guy.

JACKSON.-On July 22, to Jean (née Core) and Dr. Peter Jackson a son, brother for Elizabeth and Mark.

McKinna.—On July 19th, 1964 to Marilyn and Alan McKinna a son James-brother to Andrew and Fiona.

Deaths

LINTON-BOGLE.—On July 10, Dr. Frederick Wallace Linton-Bogle, M.R.C.S., L.R.C.P. Qualified 1928.

Murray.—On July 6, Professor Everitt George Dunne Murray, O.B.E., M.A.(Cantab.), L.M.S.S.A., F.R.C.S., aged 84. Qualified 1916.

Change of Address

Dr. B. T. Marsh to 63, Brookmead Drive, Wallingford, Berkshire. (Wallingford 2004) DR. P. H. STONE to 11, Fielding Avenue, Kentville, Nova Scotia, Canada.

Appointments

Royal College of Surgeons of England.

Mr. H. Jackson Burrows has been elected a member of the council of the college.

University College Hospital.

Dr. T. A. J. Prankerd has been appointed to the Chair of Clinical Hæmatology from 1st October, 1964.

Society of Medical Sciences of Rumania.

Sir Selwyn Selwyn-Clarke has been invited by the society to visit Rumania in August as their guest.

University of Freiburg.

Dr. Hermann Lehmann has been elected an honorary professor of the University of Freiburg in Breisgau.

DR. DAVID WEITZMAN

Dr David Weitzman, Physician to the Cardiological Department, died on August 3rd at the early age of 45. He qualified M.B., B.S. at Bart's in 1942 with honours in Pathology and won the Burrows and Skynner Prizes. He obtained the M.R.C.P., London in 1943 and served in the R.A.M.C. from 1943 to 1946, working as a graded physician in Italy and Austria; he was mentioned in despatches. On demobilisation he worked as Medical Registrar at St. Stephen's Hospital, Chelsea from 1947 to 1951, and he obtained the M.D., London. in 1947. His specialised cardiological training started in 1952 when he was appointed Registrar and later Senior Registrar at the National Heart Hospital. He then returned to Bart's as Medical Tutor in the Medical College and had charge of an acute general medical ward and outpatient clinic at the Bethnal Green Hospital where he organised revision and tutorial courses. From 1956 to 1961 he was Casualty Physician at Bart's and also Research Assistant in the Cardiological Department, holding the Cooper and Cattlin Research Fellowships. He was appoint-

cd to the Consultant Staff as Physician to the Cardiological Department in 1961. He was elected F.R.C.P., London, in July 1964 and was admitted to the Fellowship less than a

week before his death.

David Weitzman was one of the outstanding clinical teachers at Bart's. During his first appointment as medical tutor he was responsible for running courses at Bethnal Green primarily for students who failed in their final examinations, but his reputation as a teacher grew so



quickly that his rounds and lectures were much more widely attended. The clarity of his thinking writing was well shown in his "Principles of Medicine for Nurses" and "Synopsis of Cardiology" published shortly before his death. Although from 1954 to 1961 his major appointments at Bart's were in general medicine he was always actively engaged in cardiological research and published papers on phonocardiography, quinidine, coronary angiography and various other aspects of

coronary disease. His appointment as Consultant Cardiologist in 1961 gave him the opportunity to expand his research activities and his readily available expert cardiological

opportunity to expand his research activities and his readily available expert cardiological knowledge was widely used throughout the hospital and particularly in collaboration with

the cardio-thoracic surgeons.

St. B.H.J., September, 1964.

Although he always seemed tireless in carrying out all his hospital duties, his health had been poor for several years and he had several long periods of sick-leave. Earlier this year he had a severe heart attack and it was clear to him and his friends that he would not be able to return to full activity. He had no wish to live the life of an invalid and with the courage which he always showed in adversity decided to return to part-time work and to carry on as normally as was possible. He was keen on racing and extremely knowledgable about horses and his death occurred suddenly in the evening after he had spent a pleasant day at the Epsom meeting. Although he had only been on the Staff at Bart's for three years

he had established himself firmly in the affections of both staff and students and he will be greatly missed.

His wife died in 1961 and he had no family.

G.W.H.

Mr. William J. Pullen

Mr. William J. Pullen died quietly in his sleep on the 19th July, 1964. He was Beadle to the Hospital for over a quarter of a century. He joined the staff in January, 1922, was appointed Beadle in March, 1930, and retired in November, 1955.

During his long service he became the friend of all who worked in the hospital. He will be remembered for his courtesy, his shrewd sense of humour, and his generous nature.

The sympathy of all at St. Bartholomew's Hospital is extended to his widow and family.

J.G.

Ref		
B	ANKER'S	ORDER

To	Bank Ltd.	
	branch (address of your banke	rs
Please pay to the National Provincial Bank Ltd., the St. Bartholomew's Hospital Journal Account	59, West Smithfield, E.C.1 branch, for the credit the sum of £/s./dpoun words) on theday of	oi id:
This authority cancels all previous instructions.		
	(name and qualifications) (BLOCK CAPITALS) (Please sign over a 2d. Stamp)	
	(address for Journal)	
	. (da	ate

PLEASE NOTE—The completed form should be returned to the Manager of the Journal.

WE WILL SEND IT TO YOUR BANKERS.

VOX

Home.

Amongst the highlights of the celebrations at Stratford this year was a reunion of the poet's descendants. An impressive aggregate of 259 Shakespeares, Shakespears, and Shakspears turned up, plus one Shakeshaft with a gift for genealogical argument. There were plenty of bald heads, but rather few beards and a notable absence of literary interest. Heredity is a strange thing, though perhaps not so strange if it is remembered that the great man had only one son who died at the age of 12.

Who can blame anybody with a 30-year sentence for breaking jail, if all he needs is a few thousand pounds and an advertisement in the Daily Mail's personal column? Like all strokes of genius the escape was based on a simple principle—that it is easier to get into jail than out of one; but it is surely pretty remarkable that there were no bolts on the insides of any of the gates.

The first International Goat Conference, organised by the British Goat Society, was an astounding success. The Society has 1,000 members (mostly nannies), exports 50 of these each year, and thrives on those who are allergic to cow's milk and on a few whose taste is deranged enough to enjoy goat's cheese.

Abroad.

General Eisenhower is continuing to use his strong influence and personality to guide the Republican party. Goldwater to Eisenhower—"When you, general, led those troops across the Channel to Normandy, you too were an extremist". Eisenhower to Goldwater—"Yes, senator, I never thought of it in that way." And who, I would like to know, did think of it in that way?

"The loved one" is becoming more and more beloved across the Atlantic. Last year the Americans spent considerably more on pets than on babies. Amongst the more popular items are Kashmir sweaters for dogs with mink collars and ear-muffs, cosmetics for cats, bathrobes, and Christmas stockings. Although tuition fees were not listed, an advertisement appeared recently from a lady whose lost parrot was to be identified by its fluency in English, French and Welsh.

Sam Blythe, aged 69, fought in the first World War, and celebrated 50 years of survival with a visit to the Flanders battle grounds. When he got to the memorial at Ypres he found his own name among the list of dead.

Love has many connotations, and the Greeks had three separate words to express its erotic.

maternal, and neighbourly aspects. But according to the Chinese, the Greeks were talking through their helmets; the Chinese definition of love is "a psychosomatic activity which consumes energy and wastes time". And now they tell us.

Books.

Keeping the place in your book becomes an interesting problem when the dust-cover has been removed or stuck down. Borrowers from public libraries have a wide range of taste in book-markers, and often forget to remove them when returning their books. Amongst the more exciting finds at one library have been a £5 note, a full packet of cigarettes. (? Turkish), and a rasher of bacon.

Whether you are a medical student or just a plain waster, it would be nice to be able to read more quickly, and I have recently purchased a booklet which promises to double my reading speed. If I ever get through this rather dull manual, I will let you know the secret.

Medicine

The diagnosis of cardiac pain is already a complex business, requiring amongst other things a knowledge of the emotional content of Television programmes. There is all the difference for instance between a history of a chest pain experienced during The Avengers, and one during Coronation Street (which is enough to give anyone a pain). But on top of all this the cardiologist must now be an astronomer as well, for convincing evidence has just been produced that attacks of cardiac pain often coincide with periods of increased sunspot activity.

A recent advertisement in The Times ran thus—"Personable young man, feeling stifled by medical college life, seeks suitable opening for his talents in the field of commerce". Rumour has it that he was in the second six months of his clinical course at Bart's.

House Warming.

On August 20th the old Abernethian Room was at last abandoned with the minimum of nostalgia, and the new one was greeted with two large barrels of Whitbreads. As a result one's first impressions were perhaps rather highly coloured, but for a temporary arrangement everything seemed pleasantly permanent. The only change for the worse is a shortage of comfortable sleeping accommodation. This however did not spoil the inaugural party, for the standard of the refreshments was such that by teatime several inveterate sleepers, comfort or no comfort, were hard at it.

THE RELIEF OF PAIN IN LABOUR

By T. B. Boulton and P. V. Cole

The history of modern obstetric analgesia dates from 1847 when James Young Simpson first began to administer chloroform to relieve the pains of labour1. He soon met with opposition, in particular he was criticised on religious grounds by both the established and nonconformist churches. The Book of Genesis records that when Jehova expelled Adam and Eve from the Garden of Eden he told the Woman, "I will greatly multiply thy sorrow and thy conception; in sorrow thou shalt bring forth thy children." Simpson's critics regarded this statement as a divine command; to attempt to relieve pain in labour would be an act against the Will of God. In reply Simpson wrote his famous pamphlet, "Answers to the Religious Objections against the Employment of Anæsthetic Agents in Midwifery and Surgery"2. In this he quoted the twenty-first and twenty-second verses of the second chapter of Genesis, "And the Lord God caused a deep sleep to fall upon Adam, and he slept: and he took one of his ribs and closed up the flesh instead thereof; and the rib, which the Lord God had taken from man, made he a woman,". Simpson claimed that this could be regarded as the first obstetrical anæsthetic. Obstetrical analgesia was finally made respectable when Queen Victoria received chloroform at the hands of John Snow (the first English specialist anæsthetist) in 18533-4.

The Problem

There are few people today who hold the extreme views of Simpson's opponents but it is still desirable to start any consideration of the relief of pain in labour by a consideration of the question, "Is analgesia really necessary"?

The human mother has received the gift of amnesia—the power to forget; St. John⁵ expresses this in the beautiful verse, "A woman when she is in travail has sorrow, because her hour is come: but, as soon as she is delivered of the child, she remembereth no more the anguish, for joy that a man is born into the world". This is often the experience of the happy mother who has looked forward to the arrival of her child as one of the greatest events of her life, but it is not the experience of the frightened, unwilling mother who may re-

member the agony of her delivery for the rest of her life, even to the extent of resenting the child because of the pain caused by his or her arrival. There are those who argue that, since parturition is a physiological process the birth canal becomes naturally distensible and prepared for the stretching which it will receive in labour; pain it is said is the result of a "mass phenomenon" of civilised communities in which it is an ingrained tradition that labour must, necessarily, be painful⁶. Fear causes mental tension, which, in turn, engenders muscle spasm which leads to pain which completes the circle by causing more fear. In support of this theory it is stated that primitive women and animals do not experience pain in labour because they do not fear it. It is claimed that if a civilised woman overcomes her fear, she will not suffer pain. This is an oversimplification—in the first place in this country we are not dealing with primitive women and, secondly one of the authors can state from personal experience that pain is by no means always absent in labour in primitive communities, even in normal

The Psychophysical control of pain

The psychophysical control of pain in labour has received much attention in the past half century7. The various methods vary in detail but have much in common. The work of Vaughan8, Randell9, Dick-Read10, Velvosky6, Nikolaveve and others has endeavoured to substititute tranquility, mental relaxation, and muscular relaxation for fear, mental tension and muscular tension. The means to this end are education, mental training and, to a greater or lesser extent depending on the method, exercises. The latter are now regarded chiefly as a way of promoting mental relaxation rather than a means of increasing the laxity and suppleness of the pelvic muscles and ligaments as was originally taught by some of the earlier advocates of the "natural" methods. We should not underestimate the value of these methods nor must we underestimate the great influence which they have had on modern sympathetic and humanitarian approach to the woman in

The advocates of the psychophysical methods emphasise that they educate the mother to make a positive and proper use of her body; they tend to deny that suggestion, hypnotic or otherwise, has any influence on their patients. There is no doubt, however, that hypnosis can be an effective and practicable method^{11,42,43}. Michael14 achieved complete success in 76 per cent of a series of 30 cases using hypnosis alone. Advocates of "natural" methods sometimes disparage hypnosis because it is not dependent on the exercise of the free will of the mother but upon the influence of the hyp-

the influence of the hypnotist. It should be emphasised however that the method is probably more easily applicable and less time-consuming than the "natural" methods. Michael¹⁴ has shown that hypnosis can be practised within the framework of the orthodox British ante-natal clinic. Although, ideally the obstetrical attendant should be the hypnotist this is not essential; the power to induce hypnosis can be transferred to the midwife, the husband, or even the patient herself¹². Practitioners of obstetrical hypnosis emphasise that it is psychologically important for the patient to be aware of what is taking place at the time of actual delivery and to hear the first cry of the infant.

The great advantage of both the "natural" methods and of hypnosis is that they are nontoxic to both mother and fœtus and that they do not delay the course of labour. No one can pretend, however, that they are one hundred per cent successful and it must also be admitted that, when properly practised, they are often time consuming. A great deal of harm has been done to both the natural and hypnotic methods by enthusiasts who have rejected the use of drugs in all circumstances. Serious mental distress can be caused by withholding pharmacological agents from the mother when she is feeling pain when she has been led to expect a pain-free labour. The best results in the psychophysical methods have always been achieved by those practitioners who have made a judicious use of drugs when these were indicated.

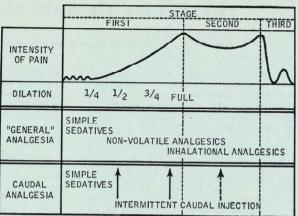


Fig. 1.—The Use of Drugs in Labour.

The Pharmocological Control of Pain

It must, therefore, be concluded that, if the aim is painless childbirth the use of drugs is a necessity. The ideal drug or combination of drugs would free the mother from pain and anxiety without interfering with the power of co-operation of the mother, without affecting the maternal respiratory or cardiovascular systems or producing any other deleterious side-effects, without diminishing the power of contraction of the uterus or interfering with parturition in any way, and without producing harmful effects on the fœtusis. In addition it would be an advantage if the drug or drugs were anti-emetic.

The drugs generally in use in this country today can be divided into the following categories (Fig. 1).

- (i) Sedatives given early in the first stage.
- (ii) Oral and parental analgesics given in the late first stage with the object of providing pain relief in that period of great stress just before and at the time of full dilation.
- (iii) Inhalational agents given in the late first stage and early second stage with the object of relieving pain during contractions especially at the second period of great stress at the crowning of the head.

(i) Sedatives in the early first stage. Various modern sedatives and tranquilising agents have been tried at this stage of labour; in particular

attention has been directed towards the phenothiazine group chlorpromazine (largactil)¹⁶, promethazine (phenergan)¹⁷, and promazine (sparine)¹⁸, have all been used. It is probable that, taking into account the increased incidence of side-effects, these drugs have very little advantage over the more traditional drugs like chloral hydrate and the barbiturates.

The powerful tranquilising agent haloperidol has been used in an attempt to produce a calm state of mind throughout labour ¹⁰, ²⁰. The effects of a single injection of the drug given early in the first stage of labour last for twenty-four hours or more. Reporting on a double blind trial Chew²⁰ concluded that, though analgesics were often required later on in labour the total dose required was less, that the mothers were less anxious and more cooperative after haloperidol, that there was no effect on either uterine contraction or the fœtus and that the forceps rate after haloperidol is probably slightly increased. In addition the drug has a powerful anti-emetic action.

Mono-amine oxidase inhibitors have also been used with a similar aim to the use of haloperidol but only a slight potentiation of analgesic drugs was reported²¹; in any case the ever increasing list of potentially dangerous side-effects of this group of drugs would seem to contraindicate their use in ordinary obstetrics.

A powerful agent phencyclidine (sernyl) has been tried²². This is reported to be a "total analgesic"; it has been found to be very effective as a sole analgesic agent but, since it is liable to produce a "catatonic trance" which can produce hallucinations and be very unpleasant for the patient²³. it is doubtful whether it will be generally adopted.

(ii) Oral and parenteral Analgesics in the late first stage. At this time pethidine continues to hold pride of place. It is a drug with maximum analgesic and minimum hyponotic effect and thus it produces a pain-free but co-operative mother during the early second stage.

If it is given alone pethidine is a fætal respiratory depressant which exerts its maximum effect three to four hours after injection²⁴. A significant advance has been achieved by the addition of the antagonist levallorphan. This combination is marked as "pethilorphan" (pethidine 100 mgm.: levallorphan 1.25 mgm.²³). The levallorphan antagonises the respiratory depressant effect of the pethidine although there is little doubt that it also slightly diminishes its analgesic property; slightly higher doses have to be administered than when pethidine alone is used.

(iii) Inhalational agents. If the administration of pethidine is well timed it will provide "background" relief well into the second stage. From just before full dilation and throughout the second stage it is the usual practice to administer inhalational agents during the labour pains. The effect of a satisfactory inhalational agent should be rapidly attained but it should equally be rapidly eliminated at the end of the pain and non-cumulative so that the mother can co-operate throughout the second stage. The agents generally in use in this country are nitrous oxide and trichloroethylene ("Trilene").

Trichloroethylene 0.5 per cent in air was finally accepted for use by unsupervised midwives in 1955 after suitable apparatus, (the Emotril²⁶ and the Tecota), had been produced. Tricholoræthylene 0.5 per cent has the advantage that almost the same concentration of oxygen as in ambient air is available to the mother and thus to fœtus but it has the disadvantage that it is not an entirely satisfactory demand analgesic. It tends to be cumulative. If it is exhibited too early in labour the mother may become uncooperative, drowsy or even unconscious27. Blood levels measured during and between inhalations have been shown to be identical28. It is small wonder that there is a tendency to withhold the use of the drug until well on in the second stage thus denying the mother the benefits of analgesia at the time of great stress just before and at full dilation, (Fig. 1). Trichloræthylene is, perhaps, of greatest value in domiciliary obstetrics because the apparatus is very portable and the mothers are usually multiparous and therefore tend to have relatively rapid deliveries.

Nitrous Oxide and air has been approved for use by the Central Midwives Board since the pioneer work of Minnitt in 1933**. It is rapidly absorbed and eliminated giving reasonable analgesia but at the same time allowing the mother to be co-operative between pains.

Nitrous oxide has a very evanescent action. This means that timing is all important. The gas produces analgesia some 25-30 seconds after vigorous inhalation whereas the time from appreciation of pain to actual discomfort is about 15 seconds³⁰; if maximum effect is to be achieved the mother must be instructed to anticipate the pain. This is, of course, difficult; if the gas is exhibited too late the drug is often reported to be ineffective.

Another disadvantage of the nitrous oxide: air combination is that its low potency necessitates a 50 per cent proportion of nitrous

oxide, the mixture thus contains only half the proportion of oxygen found in air (10.5 per cent instead of 21 per cent). This gives rise to desaturation of both the maternal and feetal arterial blood⁵¹.

Cole and Nainby-Luxmore have recently revealed a further startling practical defect in the method31,32. They have shown that nitrous oxide—air machines in everyday use are frequently inaccurate even when regularly serviced. In one study over half of thirty-five machines tested produced dangerously low concentrations of oxygen-in one case as low as 1.8 per cent. It is true that the machines are often most inaccurate when the patients breathe other than specified in the C.M.B. testing regulations for nitrous oxide: air machines but there is ample evidence that women in labour do frequently exceed the set limits (minute volume 9 litres, tidal volume 500 ml.)33. It must, therefore be concluded that even if the apparatus complied with the C.M.B. regulations when it left the manufacturer there is no guarantee that it will remain accurate or indeed that it is acurate under practical conditions. It may further be noted that agents who service these machines frequently have no method of testing the concentration of nitrous oxide delivered.

The perinatal death rate in this country in 1958 was 3.2 per cent (i.e., the number of babies who died at birth or in the first seven days of their life); about one-fifth of these deaths were probably caused by fœtal anoxia34. In addition many cases of cerebral palsy are related to a period of fœtal anoxia and there are unknown numbers of babies with minor cerebral damage. The very contractions of the uterus itself are known to cause fœtal anoxia by reducing the placertal blood flow. It has long been the practice to discontinue nitrous oxide -air analgesia in cases of placental insufficiency or fœtal distress but it now seems to be abundantly clear that the administration of nitrous oxide 50 per cent : air 50 per cent should be abandoned altogether35.

Nitrous oxide and oxygen mixtures in proportions of up to 70 per cent nitrous oxide have often been administered by anæsthetists for the relief of pain in labour; recently efforts have been made to produce machines from which patients could breathe such mixtures and which would be approved by the C.M.B. for use by midwives in the absence of a doctor.

The problem has been approached in two ways; first the development of accurate machines with separate standard oxygen and

nitrous oxide supplies from cylinders or pipe lines and, secondly, the production of a cylinder containing a mixture of the two gases.

Nitrous oxide and oxygen from seperate supplies. Two machines have now been produced with seperate supplies of oxygen and nitrous oxide; there are the "Lucy Balwin," (British Oxygen Company), and the A.E. (Anæsthetic Equipment Ltd.). Both machines work on the intermittent flow principle, that is they only supply the mixture when the patient inhales from the machine. They are capable of delivering up to 100 per cent nitrous oxide but, in practice, a stop limits the percentage of nitrous oxide to the authorised concentration. Both machines incorporate a safety device—if the oxygen cylinder runs out the nitrous oxide is automatically cut off also and the patient can then only inhale air.

Doughty and McAnery³⁰ and the Medical Research Council have both recently concluded trials. Doughty's figures show that 50 per cent oxygen—50 per cent nitrous oxide gave "adequate or complete relief" in 92 per cent of labours as assessed by the attending midwives. The mixture did not affect the fœtus or the co-operation of the mother.

It is probable that the C.M.B. will shortly authorise the use of the Lucy Baldwin, A.E., or similar machines for use by unsupervised midwives for concentrations up to 50 per cent. In certain hospitals where medical staff is readily available permission may be given for the use of mixtures up to 70 per cent nitrous oxide.

Independent tests²⁸ would seem to indicate that of the two machines the A.E. has the lower resistance and is possibly more reliable in giving a constant and accurate mixture. The disadvantage of these machines is that equipped with separate oxygen and nitrous oxide cylinders "in use" and "reserve"—they are heavy and unsuited for domiciliary use. If piped gases are available in the maternity department they are very cheap to run and probably have an assured future in hospital practice. It will, of course be vital that the machines are regularly tested and serviced.

Mixed nitrous oxide and oxygen from the same cylinder. Research has been progressing for some years into the possibility of producing a single cylinder containing an accurate and constant mixture of nitrous oxide and oxygen^{37,38,19}. Such a cylinder would only require a simple apparatus with a single

St. B.H.J., September, 1964.

COOLING

CONDENSATION
TEMPERATURE

-1.5° C.

APPROXIMATELY

COUNTY A 96



IN USE

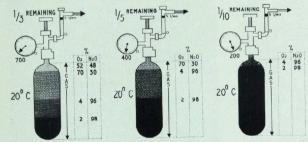


Fig. 2.—The Effect of Cooling, re-warming and using a cylinder containing a mixture of 60 per cent nitrous exide and 40 per cent exygen.

Erratum: the figure 70 and 30 in the 3rd., 4th., and 5th. diagrams should be interchanged.

demand valve, (similar to that used in an aqualung), to deliver a constant mixture of nitrous oxide and oxygen. The British Oxygen Company has now successfully produced cylinders containing 50 per cent and 60 per cent nitrous oxide with oxygen. If these cylinders are kept at room temperature they will supply the specified mixture continuously until they are empty; if they are cooled or cooled and rewarmed the mixture may vary as

the gases are run off. (Fig. 2)38,40.

If a 60 per cent nitrous oxide 40 per cent oxygen cylinder is cooled the nitrous oxide will liquify when the temperature reaches approximately -1.5 degrees C. If the cylinder is not allowed to rewarm the nitrous oxide will return to the gaseous phase but will remain as a concentrated layer in the dependent part of the cylinder. If the gas is now withdrawn from the cylinder the mixture delivered will at first contain a higher proportion of oxygen than the specified 40 per cent; as the cylinder is exhausted however the concentration of nitrous oxide in the mixture will slowly rise until eventually almost pure nitrous oxide will be delivered. The mixture would thus at first be less effective than it should be as an analgesic mixture but towards the end would be liable to cause dangerous asphyxia. In the case of a 50 per cent mixture the temperature of condensation would be approximately-8 degrees C. This temperature is reached in the open in the British Isles on about thirty nights of the year. If the cylinders were to be authorised for use by midwives certain simple precautions would have to be taken; the cylinders would be the 50 per cent mixture, they should be stored away

from frost and if they did become frozen they would have to be rewarmed in tepid water and inverted two or three times before use to ensure thorough mixing.

Machines designed for use with the mixed cylinders would be comparatively simple; they would carry one "in use" cylinder and one "spare", the whole unit would weigh about 24lbs. (9.1 kilogrammes) with both cylinders. Two full cylinders would contain enough mix-

ture for approximately seven labours. It must be emphasised that although nitrous oxide: oxygen is much safer than nitrous oxide: air, it still has the same inherent limitation because, unless the administration is carefully timed, the analgesia will not be complete before the pain has reached its greatest intensity.

The Future

But what of the future? Are we really satisfied with the standard of pain relief in labour in this country 11? In the trial of 50 per cent nitrous oxide: oxygen mixture conducted by McAneny and Doughty30 it was stated that analgesia was "complete or adequate" in 90 per cent of cases as assessed by the attendant midwives: when the opinion of the mothers was asked however, relief was "considerable or complete" in only 52 per cent of cases. It can he noted in passing that when the 60 per cent nitrous oxide mixture was inhaled, although the midwives' assessment of "complete or adequate relief" remained at approximately 90 per cent, and the mothers reported that they had "considerable or complete relief" in 64 per cent of cases. Unfortunately the statistics do not state how many mothers had "complete" relief. It is probably true to say that the British mother expects to have pain in labour: we should contrast this attitude with that of the American woman who regards a failure to relieve pain in labour as a failure on the part of her obstetrical attendant.

In the United States the vast majority of confinements take place in hospital and are conducted by obstetricians or general practitioners assisted by nurses, there are no midwives. In this country the great achievment of recent times has been the attainment of an exceptionally high standard of ante-natal care; this enables us to make domiciliary midwifery possible and reasonably safe because the complicated cases are largely eliminated and electively confined in hospital. It would not. however, be honest to pretend that the doctor or midwife practising domiciliary midwifery has really adequate facilities available to deal with any emergency which might occur; everyone who practises domiciliary midwifery has their anxious moments from time to time waiting for the ambulance or flying squad. This is especially true in rural areas; during the time of waiting mother or child or both may be at risk. It must also be admitted that the facilities for practising really good analgesia are much more limited in the home than in the hospital. It is also true that there is an increasing desire on the part of mothers

for confinement in hospital. For all these reasons we believe that the next twenty years will see a great decrease in the practice of domiciliary obstetrics. Whatever form the obstetric units of the future take, be they general practitioner or consultant, there will be better facilities for the practice of analgesia in labour.

What kind of analgesia will be practised? In the first place, with the advent of large obstetrical units, it will be possible to elevate the status of analgesia from that of an incidental chore and make it the responsibility of a single individual be he or she obstetrician, anæsthetist or midwife. The choice of method may well be local analgesia.

Local Analgesia

In this paper no reference has vet been made to the use of local analgesia; this is because we have deliberately concentrated our attention on the methods which are or shortly may be available to midwives who, at the present time are personally responsible for conducting the majority of normal labours in this country24. It is, however, the opinion of the writers that local analgesia, in particular caudal analgesia, offers the best solution vet devised to the problem of the relief of pain in labour. The practice of caudal analgesia does, however, require meticulous organisation and supervision. Local analgesia is relatively nontoxic to mother and fœtus, does not interfere with maternal co-operation and does not depress maternal or fœtal respiration.

Topical analgesia. In the recently developed "Scandinavian method" a topical solution of lignocain is sprayed onto the vulva and into the vagina when the head of the baby reaches the perineun. A special pressurised bottle with a three-inch spout is used. The authors have no personal experience of this method but presumably, since it is only applicable at the end of the second stage, other drugs such as pethidine must be employed earlier in the labour. In one series "a good effect" was reported in 80 per cent of cases⁴².

Cadual Analgesia43-45.

The diagram (Fig. 3) shows that all the sensory pathways from the uterus cervix, and vagina and perineum are transmitted from segments of the cord below T. 11. The pathways from the body of the uterus are via the sympathetic system and those from the vagina, perineum and vulva from the various components of the pudendal nerves, impulses from the cervix are conducted via the pelvic parasympathetic. On the motor side, however, while

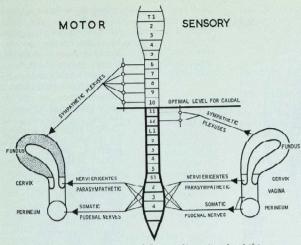


Fig. 3.—The Motor and Sensory Nerve Supply of the Uterus and Birth Canal.

the nerve supplies to the cervix and vagina, (parasympathetic), and perineum and vulva (pudendal), are from below T. 11 the supply to the fundus of the uterus is from the sypathetic system above T. 11. If the segments below T. 11 are blocked with a local analgesic we shall stop pain from dilation of the perineum and cervix as well as from the contracting uterus but, while the cervix, vagina, and perineum will be relaxed the uterus itself will still be able to contract and push the baby down the birth canal because its nerve supply is above T. 11. This is exactly what caudal analgesia can be made to do. The local analgesic solution injected into the caudal canal can be made to rise to the desired level in the epidural space with considerable accuracy if it is injected in aliquots. The solution spreads by displacement in the fat-filled space rather than by rapid diffusion through a fluid as would be the case in a spinal anæsthetic. There is one disadvantage and that is that, since the perineal muscles will be relaxed, they will not be available to push the fœtal head through the vulva after the head has been pushed down onto the perineum by the uterus. In most cases the head must be lifted through the introitus by outlet foreceps.

A well conducted labour under caudal analgesia is a truly impressive procedure. During

the comparative calm of the first stage an epidural catheter is introduced through the sacral hiatus, (Fig. 4). The patient is placed on her side with her knees drawn up, the upper leg being slightly more flexed than the lower. The skin is cleaned and the sacral hiatus located between and below the cornua. An intradermal skin-wheal is raised and a small amount of local analgesic injected into the sacrococcygeal membrane which overlies the sacral hiatus. An 18 s.w.g. needle is then inserted through the skin and then through the sacro-coccygeal membrane at an angle of about 70 degrees to the surface. As soon as the needle is felt to pass through the membrane the butt of the needle

is depressed another 20 degrees and the needle advanced 1 to 2 cms. up the canal. The stillette is removed; if neither blood nor C.S.F. drips from the needle it is neither in a blood vessel nor in the dural space; an aspiration test with a syringe will confirm that the needle is correctly placed. An epidural catheter is then introduced up the needle and about two centimeters beyond to tip; the needle is withdrawn leaving the catheter in situ. Intermittent injections can be given by means of a three-way tap arrangement, an intermittent drip, or a large syringe; if the latter method is used the syringe may be encased in a sterile nylon sleeve so that the sterile plunger can be manipulated by the unsterile hand40

One per cent lignocaine with adrenaline 1:200,000 without preservative should be used. A test dose of 5 ml. is given as soon as the contractions of the first stage are established; the cervix should be at least "two-lingers" dilated. If there is no evidence of sub-arachnoid injection (i.e., a spinal anæsthetic) or other untoward reaction a further 15 ml. is administered if the patient is of average height and weight. One or two subsequent injections will be required at approximately two-hour intervals (Fig. 2).

Analgesia usually develops within five

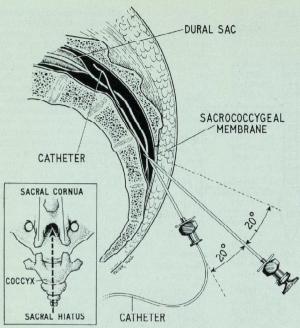


Fig. 4.—Diagram showing the method of introduction of an epidural catheter into the sacral canal.

Inset: location of the sacral hiatus.

minutes and is complete within 15 minutes. An early sign of successful block is the relaxation of the anal sphincter and the introitus—the "grinning perineum". If there is any fall in blood pressure it will be maximum five to ten minutes after injection; it should, therefore be checked after this time interval.

In a well conducted case labour will be almost entirely painless. After full dilation the contracting uterus pushes the fœtal head gradually and smoothly down the relaxed birth canal until it rests on the perincum; this movement can be aided by the mother holding her breath and pushing gently during contractions. although the mother cannot feel the pain she can be told when to push by an attendant lightly palpating the uterus through the relaxed abdominal wall; a co-operative mother can even be taught to palpate the uterus herself. When the baby arrives at the

perineum the head is gently and atraumatically lifted through the relaxed vulva by outlet forceps; an elective episiotomy is performed if this indicated. If intravaginal manipulation or mid-forceps application is required then it can be easily performed because of the laxity of the birth canal. There is actually a tendency for the head to rotate to the posterior position under caudal analgesia but this can easily be anticipated and corrected. The third stage is usually rapid with little bleeding and the uterus contracts well thereafter thus minimising postpartum hæmorrhage

The chief hazard of caudal analgesia is the possible danger of producing a large volume of analgesic into the sub-arachnoid space. If care is taken not to advance the needle too far and the aspiration test and test dose are never omitted this hazard can be avoided. Care must be taken not to inject too great a volume for the size of

the patient—it is best to "build up" analgesia by the intermittent injection of small aliquots. If the block extends above T. II uterine inertia may result and there may be a severe fall in blood pressure. Under normal conditions the fall in blood pressure is usually small and rarely exceeds 20 mm./Hg. Falls in blood pressure can usually be treated by elevating the legs; vaso-pressors are rarely necessary.

Caudal analgesia is not applicable to all cases. In about five per cent of cases the sacral hiatus is anatomically unsuitable; lumbar epidural analgesia can be used in such cases⁴⁷ but, although it has the advantage that a smaller volume of solution is necessary, it requires considerably greater technical expertise. Local infection of the skin and disease of the central nervous system are contraindications to both methods. It is unwise to use caudal or lumbar extradural analgesia in

patients with placenta prævia or accidental hæmorrhage because of the lax lower uterine segment produced by these methods. In multiparous women who have quick easy labours it is neither necessary nor desirable to use caudal or lumbar epidural analgesia. It is clear therefore that alternative methods of obstetric analgesia must be available.

The Administrative Problem

In a large American unit using caudal analgesia there may be four or five women in various stages of labour at any given time. One or two resident obstetricians are on duty on the labour floor; they perform the caudals, administer the intermittent injections, and lift the babys over the perineum with low forceps.

The mothers are watched and monitored by nurses who summon the doctor when any of the above procedures are required. The anaesthesiologist is called to the unit only when special methods of analgesia or anæsthesia are required—for cæsarian section for example.

If, as has already been predicted, domiciliary midwifery gradually declines in favour of hospital delivery, the problem of integrating such a system into our British service will arise. The authors are aware that neither of them is either an obstetrician or a midwife, but they nontheless feel justified in humbly offering their opinion on this subject. If larger units are introduced it will surely be practical and economical to have a resident obstetrician on duty in the labour wards at all times. It has been suggested that it would be more practicable to have an anæsthetist rather than an obstetrician in constant attendance but, since the latter can both deliver the baby and supervise analgesia, his presence would be more valuable and economical. The part that the midwife should play is more controversial; she will obviously be required to nurse, encourage, support and supervise all mothers in labour and to deliver those cases in which caudals or epidurals were contraindicated or not used. We ourselves do not see why, if the obstetric floor is under constant medical supervision, midwives should not be trained and authorised to administer the intermittent caudal injections or even to deliver the baby with outlet forceps.

Summary

The methods of obstetrical analgesia at present in use in this country have been reviewed with special reference to those which

are, or shortly will be available for use by unsupervised midwives. The importance of a humanitarian and sympathetic approach to women in childbirth can not be overemphasised.

The authors believe that the next few decades will see a decline in domiciliary obstetrics and that increased and improved hospital facilities will give us an opportunity of improving obstetrical analgesia in this country to a standard worthy of our civilised and sophisticated society. Intermittent caudal analgesia has much to offer as a routine method of pain relief in labour.

Acknowledgements. The authors wish to thank Mr. David Tredinnick and Mr. Peter Cull of the Department of Medical Illustration for their willing co-operation.

References

- ¹MARSTON, A. D., (1949), Modern Practice of Anæsthesia, 1st Edn., ed. Evans, F. T., p. 7, Butterworth, London
- "SIMPSON, J. Y., (1847), Answers to the Religious objections against the employment of anæsthetic Agents in Midwifery and Surgery.
- ³RICHARDSON, B. J. (1858), forward to "On Chloroform and other Anæsthetics", Snow, J., D. XXXI, Churchill, London.
- *SYKES, W. S., (1960), Essays on the First Hundred Years of Anæsthesia, Vol. 1, p. 77, Livingstone, Edinburgh.
- 5St. JOHN, Gospel according to, (authorised version), Ch. 16, v. xxi.
- VELVOSKY, I., PLATONOV, K., PLOTIDER, V., SHIIGOM, E.. (1960), Painless Childbirth through Psychoprophylaxis, (trans. Myshne, D. A.). Foreign Languages Publishing House. Moscow.
- RANSOM, S., NIXON, W. C. W., (1963), British Obstetrical and Gynæcological Practice, p. 1199, ed. Claye. Sir A., Heinemann, London.
- VAUGHAN, K., (1937), Safe Childbirth, Baillière, Tindull & Cox, London.
- ⁶RANDELL, M., (1943), Training for Childbirth, 3rd. edn., Churchill, London.
- ¹⁰DICK-READ, G., (1947), The Birth of a Child, Heinemann, London.
- ¹¹DE LEE, J. B., GREENHILL, J. P., (1939), Year Book of Obstetrics, p. 164, Year Book Publishing Co., Chicago.
- ³²AMBROSE, G., NEWBOLD, G., (1956), A Handbook of Medical Hypnosis, p. 200, Baillière, Tindall & Cox, London.
- ¹³MARMER, M. J., (1959), Hypnosis in Anesthesiology, p. 58, Blackwell, Oxford.
- ¹⁴MICHAEL, A. M., (1952), Brit. Med. J., i, 734. ¹⁵STURROCK, J., (1939), J. Obstet. Gyn. Brit. Emp.,
- 18SAVAGE, D., (1955), Brit. J. Anæs., 27, 347.

³¹GORDON, L. E., RUFFIN, C. L., (1958), Am. J. Obstet. Gyn., 76, 147.

¹⁸MATHEWS, A. E., (1963), Brit. Med. J., ii, 432.
 ¹⁸BECK, Von L., (1962), Geburtsh. u. Frauenheilk, 22, 1519

²⁰CHEW, W., (1963), Paper to Meeting Anæsthetists N. E. Met. Reg.

²¹STEIN, S., PAXTON, N. F., (1963), Am. J. Obst. Gyn., **85**, 507.

²²CAMILLERIE, J. G., (1962), Anæsthesia, **17**, 422. ²³WADDY, F. F., (1963), Anæsthesia, **18**, 117.

MBULLOUGH, J., (1960), Proc. R. Soc. Med., 53, 509.

²⁵CRAWFORD, J. S., (1959), Principals and Practice of Ubstetrical Anæsthesia.

²⁶EPSTEIN, H. G., MACINTOSH, R. R., (1949), Brit. Med. J., ii, 1092.

²⁷SEWARD, E. H., (1949), Lancet, ii, 781.

²⁸COLE, P. V., (1964), Unpublished data. ²⁹MINNITT, R. J., (1934), Proc. R. Soc. M

²⁶MINNITT, R. J., (1934), Proc. R. Soc. Med., **27**, 1313.

³⁰SEWARD, E. H., BRYCE-SMITH, R., (1957), Inhalational Analgesia in Childbirth, p. 16, Blackwell, Oxford. ^a COLE, P. V., NAINBY-LUXMOORE, R. C., (1962), Anæsthesia, 17, 505.

⁻⁸²NAINBY-LUXMORE, R. C., (1962), Anæsthesia, **19**, 421.

³⁵COLE, P. V., NAINBY-LUXMOORE, R. C., (1962), *Brit. Med. J.*, **i**, 1118.

 BUILER, N. R., BONHAM, D. G., (1963), *Perinatal Mortality* (1958), p. 167, *Livingstone*.
 MOTT, J. C., (1961), *Brit. Med. Bull.*, 17, 144.

³⁰McANENY, T. M., DOUGHTY, A. G., (1963), Anasthesia, 18, 488.

⁹⁷TUNSTALL, M. E., (1961), Lancet, ii, 915.

³⁶GALE, C. W., TUNSTALL, M. E., WILTON-DAVIES, C. C., (1964), Brit. Med. J., i, 732.

4ºCOLE, P. V., (1964), Anæsthesia, 19, 3.

EDITORIAL, (1964), Anæsthesia, 19,

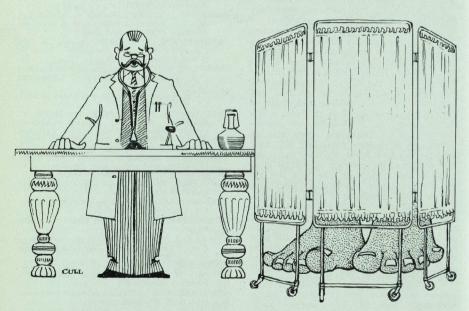
⁴²Foreign News, (1964), Medical News, 92, 7.

⁴³HINGSON, R. A., (1949), Brit. Med. J., ii, 780.

44GALLEY, A. H., (1949), Anæsthesia, 4, 194.

45SOLOMON, H. J., (1963), Med. J. Aust., 11, 215.

⁴⁹COLE, P. V., (1964), Anæsthesia, in press. ⁴⁷NIELSEN, J. S., et al (1962), Canad Anæs. J., 9, 143.



.... evidence of one or two unusual clinical features which I shall attempt to describe"

FURTHER REFLECTIONS ON PROFESSIONAL WOMEN

By H. Wykeham Balme

Among those things taught to me as a student that were both true and remembered were some wise words spoken by the late Mr. Seymour Plilips in a dissertation on the attributes of a good doctor. The most important thing, we were told, was that he should be a kind one, and the next was that he should be patient; far less important than either of these was that he should be clever. All doctors are pretty clever anyway, or they would not pass all those examinations. There was no great need for them to be any cleverer than that, though if they were it was so much the better, provided that they were also extra kind and extra patient.

The apprenticeship system of training, which we still stoutly maintain, aims at fostering these attributes. And in any case book-learning is no substitute for supervised clinical work, or the student would learn only about discases and nothing about sick people. For instance, I believe the following to be true; the only difficult thing about Medicine is the 1st M.B.; some of the best doctors are not particularly intelligent; some extremely intelligent physicians are horrible doctors; no nasty people ought to take up Medicine.

The medical training includes definite educational benefits, for despite the wasteful memory-slog of the 1st and 2nd M.B.'s it promotes accuracy of thought, genuine-etymologically genuine—sympathy, and an appreciation of pragmatism. Should women receive these benefits?

I believe the following also to be true: it is more important for a woman to be well educated than a man as she has more influence over the household and its growing children; her fertility imposes grave problems because the speed of technological advance means there is no room for Rip Van Winkle-ism in Medicine: although women have smaller brains and larger pituitaries than men, this seems at times to be actually to their advantage, and some of them make exceptionally good doctors.

The reason for this is a little unexpected, and the women themselves never seem to

realise the special advantages they may possess. It is not that they are kinder, more patient, or cleverer than men, but that they are less aggressively ambitious. Ambition to do the best you can is fine, but some doctors spoil it all by being too ambitious for success financially, socially, or in professional standing. Women seem to be better about this than men, and some of the most single-minded and dedicated doctors I have met, and with the highest integrity, have been women. When they are like that they are also humble enough to learn, and interested enough to keep up-to-date. They are fine.

Mrs. Frean's article on Professional Women was about women doctors. It was clever, but showed little patience with the retiring Sub-Dean, and was perilously near to being unkind to the poor man. That she should thus ignore the very precepts which she had extra opportunities to learn from Mr. Seymour Philps argues that one should pay close heed to what she says.

Nevertheless, in my opinion she is wrong in thinking that there is no reason to suppose that medical standards are lower in Russia, in implying that high marks in the pre-clinical examinations are of much more importance, in believing one can suddenly re-enter Medicine after a lapse of years, let alone catch up with a specialty, or that any clinical ("Of or pertaining to the sick-bed" O.E.D.) can be routine or lacking in responsibility.

In effect, Medicine is a job, not a branch of learning. Like engineering, it is changing extremely fast. Like art, it requires intuition rather than intelligence. Like school-mastering, it is entirely concerned with people. Gain some understanding of it in the laboratories of the physiologist and (especially) the pathologist, but learn its real nature in the wards, in the Out-Patient and Casualty departments, in doctors' surgeries and also, if you like, in philosophical disputations at midnight and in the friendly chatter of clubhouses and public bars.

SINGLE, DOUBLE OR GROUP?

By Dr. H. M. Weaver

The vast majority of the medical profession are at heart individualists with strong personal views, and herein lies the root of many of our problems in relation to terms of service and remuneration, as well as general structure of practice. Those contemplating general practice as a career will do well to consider the prospect long and seriously before committing themselves to any particular type of practice. The possible types are obviously, single handed practice, a partnership of two, or a group of three or more. Each type of practice obviously has particular and individual problems.

Single handed practice under the terms of the N.H.S. needs little imagination to visualize the problem. The prospect of twenty four hours a day, three hundred and sixty five days a year on call with no cover for holidays or sickness. except by the employment of locum costing in the neighbourhood of forty to fifty pounds a week, or a problematical arrangement with neighbouring practitioners, is sufficient to deter all but the bravest. Practising in isolation has little attractions for any but the lone wolves of the profession. It should not, however, be forgotten that in single handed practice you get what you yourself earn, the harder you care to work the greater your recompence, you are entirely your own master with no other person to consider, and you are able to make your own terms and standards with your patients, likewise the expense factor is entirely within your own control. These are no mean advantages, but the ever decreasing number of singlehanded practices in the country reflects the choice made by the vast majority of G.P.s.

A partnership of two eradicates many of the disadvantages of single handed practice, but one is still on call on alternate days and alternate weekends, which means a fairly restricted life. Financially this is probably the most advantageous. For a dual partnership the close association inevitably calls for the greatest degree of personal compatibility, and of personal adjustment to one's partner, if a harmonious relationship is to be established and maintained. Short term illness and holidays can be adequately covered but prolonged incapacity remains a serious problem in such a partnership.

Obviously no form of human partnership is without problems but the vast majority of G.P.'s feel that a carefully selective group

arrangement provides the best answer to the problem of N.H.S. practice under the present oppressive terms of service which are so heavily formed and weighted in the patient's favour. The optimum number to form a group is very much a matter of personal opinion, three is obviously the minimum, and I would feel that four or five should be maximum to avoid the group becoming unwieldly and unmanageable. This varies greatly according to the location, position and the local conditions pertaining. Certainly, a full partnership is the ideal, and in considering your urban practice the whole group is more efficient if operating from a central surgery. I myself am a member of a group of five operating in such a way, and we find that adequate secretarial help with at least one shorthand-typist-cum-book-keeper is essential, with a number of full or part-time receptionists-cum-telephonists, the number varying according to the number of patients. A resident caretaker at the central surgery, or at least a telephone answerer covers the phone at all times that the secretary and/or receptionist are not on duty, and gives a twenty four hour coverage for incoming telephone calls. One good secretary can deal adequately with the correspondence and administration of five practitioners. Messages and calls are received by the receptionists who also get out record cards and deliver them to each doctor consulting in the surgery. In this way the practitioner is free to devote his whole time and energy to patient care, with a minimum of his time absorbed by paper work.

Hours of work and leisure are regulated by a rigidly controlled rota system which in such a group as ours means one day on call per week and one weekend in five. This gives a much more reasonable life, and the certainty of the majority of one's nights in bed, and incidentally, allows one to get less irritated by the over anxious and the ignorant from whom the vast majority of unnecessary late calls emanate. Each partner has a full half day, and each partner takes five weeks holiday per year. hence in a group of five for half the year one partner is on holiday and five days a week one partner is on half day. This means that for the majority of the time in a practice of five, only three are fully effective at any one time covering a five-man list. With a full partnership list and the usual outside commitments this entails fairly heavy pressure and a good days hard work. This is, however, compensated by a knowledge that when off duty, work is taken care of and one can relax without anxiety on half day, weekend or holiday.

The orginal concept of group practice prior to N.H.S., was in many cases that each partner would "specialise" to a degree in one branch of medicine and act as practice adviser or "consultant" in this branch. Since 1948, with the full consultant range available to the majority of practitioners from the local hospital, there is little incentive or point in such an arrangement save for ones own satisfaction. Likewise in areas such as ours where X-ray and laboratory facilities are directly available to the G.P., either at the hospital or domiciliary, there is little point in doing elaborate side room work. Indeed, under present conditions, if one maintains a conscientious standard of consultation, examination and visiting there is insufficient time left for clinical research. The items of service per patient are steadily rising, as is the population, but the medical intake does not keep pace with these, and the load appears likely to increase rather than diminish.

A group therefore has become a means of achieving the greatest efficiency in the conduct of practice, of giving a good service without at the same time producing an ulcer or coronary and providing a more reasonable life and hours of work. Even so, in a busy group with a full list the average working week is somewhere in the neighbourhood of sixty to seventy hours

There are however, defects and drawbacks inherent in group practice. From the patients point of view there is the objection that to some extent he may lose the personal care of his own doctor-in an extreme case, for example, during a busy winter it may well happen that one patient during a serious illness is visited by all five partners, particularly if he has been a persistent "late caller". In fact this rarely occurs, and we care largely for our own patients. When they are seen on a late call and need revisiting they are handed back to their normal practitioner. New calls, however, are divided equally among partners, allowance being made for the other work to be covered e.g. industrial work, branch surgeries and medical boards etc. Again, this may mean that a patient does not always get the practitioner requested. Surprisingly, a very small number of patients object to the system, the majority accept it quite happily and accept any member of the partnership while they may still prefer their own practitioner. It is in fact true that this

system very often provides a refreshing change for both partner and patient particularly in chronic cases where a new personality, a new outlook and new approach are often a good thing. We have indeed many patients who, over the past seventeen years of our groups existence have gone full circle around the partners to our mutual advantage. We make it a rule that any patient may see any partner in the practice and the partners are quite happy providing the patient remains within the practice. It is noteworthy that such changes by the patients do not necessarily imply lack of trust or dislike of a partner, but rather that the patients have accepted the system that we have imposed, and this is in fact a tribute to the harmony and integration of the partnership.

Financially it is usually presumed that a large group with full lists and outside commitments is the most profitable particularly as preprises and expenses are shared. Recent sur-

premises and expenses are shared. Recent survevs however have shown very clearly that this is untrue, and that the financial optimum for work done is a partnership of two or at the most three. This is difficult to understand, but the statistics are convincing, and the reason would appear to be that the expense factor rises disproportionately heavily as the number of partners exceeds three; and that with the present system of remuneration where practice expenses are averaged out throughout the country, the higher the expense factor in the practice the smaller the net income. There is a present need for the actual expenses incurred to be allowed on an individual basis, as the present system is an absolute disincentive to provide a good service and good facilities for patients. Generally speaking the larger the group the less advantageous financially, though this of course is counteracted to a degree by a more reasonable life and cover for holidays and incapacity. It certainly is not possible for a large group to work efficiently and keep their expenses down to the national average. In assessing expenses one must take into account not only expenses incurred at the surgery but also transport expenses, house telephone etc. When one compares this situation with that of the consultants who have premises, secretarial help, locum and holiday cover provided it increases the differential to a very in-

equitable degree.

Despite the seething discontent and the vast amount written about General Practitioners in the N.H.S., it still remains the Cinderella of the service and little has been done to remedy this. To be fair, this is in part due to the widely divergent views of practitioners themselves as to what should be done and what is required. The formulation of a solution with

the Ministry of Health and the Treasury is a Herculean task which has so far defeated a succession of very able Ministers. Despite discontent regarding remuneration and service terms, many G.P.'s preserve a harmonious relationship with their patients and continue to practice conscientious medicine.

General Practice is a study in personal human relationships and the management of patients in the hovel, semi-detached or the mansion with equal ease and facility is an art in itself. It is not only in the patient-doctor relationship that this is true, it is quite true in the doctor to doctor and wives to wives relationship, some would even say that the latter was the more important. The achievment of a successful and harmonious group, from men who are individualists is not easy. All partnerships have hazards, and as the number of partners increases so must the potential causes of friction and differences and the possibilty of serious disagreement. Difference in temperament outlook and background have to be merged and accepted. Agreement has to be reached on size of lists, outside commitments and the general work load desired. Individuals in a partnership must have roughly the same work potential. Some G.P.'s can do twenty four visits a day as rapidly and efficiently as another who finds half that number more than enough, and the same applies to surgery consultations. A slower more deliberate worker is unlikely to be able to increase his work potential and accordingly these two practitioners will probably not form a good partnership. Likewise it is important that partners should have roughly the same financial incentive. One insulated from anxiety by a private income, or possession of capital, is unlikely to want to earn as much the hard way as one entirely dependent on his earnings. The partner with no children or commitments is not likely to desire the same income as one with three children to educate at boarding school.

General agreement has to be reached in the standard of practice and treatment. No two individuals handle problems in the same way and hence it is usually best to divide incoming calls equally, and then for each practitioner to handle his own list in his own way. It is impossible to legislate in surgery consulting, even with an appointment system patients still see whom they wish, even if it means a long wait in the waiting room or on the list of appointments.

Personal agreement as regards leisure acti-

vities must be clearly defined. If one partner undertakes public work e.g. on the local authority, Executive Council etc., as an interest, is this any more worthy than the partner who plays golf, is a yachtsman or a racing motorist? If allowance is made for one interest why not for all? Generally speaking I think that the rule is that the same amount of leisure is available to each, and each one is at liberty to organise his work to follow his own particular interest, but the practice work must take priority.

Ideally, in a group, one should have as wide a variety of personalities and temperaments as is possible with mutual compatibility. This automatically gives a wider choice for the patient to find a character and type to his own liking and gives greater variety of outlook within the practice. Whatever the diversity of personalities there is an over-riding need to sink personal views and wishes in the common weal. Tolerance, patience and mutual understanding are essential if harmony is to be achieved, particularly where practice and family interests clash, as on occasions is inevitable. Making the choice of a partner is a vital matter and at least one year's preliminary assistantship with a view to partnership is essential for mutual assessment to be made. Partnerships under the N.H.S., are usually permanent, life long, and the early discovery of personal idiosyneracies, personality defects and deficiencies will avert many a misallience.

I have said nothing concerning clinical practice and the maintenance of up-to-date knowledge, but there is no doubt in my mind that the free discussion of cases and treatment which takes place over the post-surgery coffee is of great importance. As a practice we hold no clinical meetings but there is a free exchange of ideas and information. Obviously a further advantage of the group is in allowing the partners to undertake Post Graduate courses without prohibitive expense.

Personally I am convinced that under the present terms of service of General Practice a group provides virtually the only way of providing reliable twenty-four hour coverage for patients with a prompt and good service, while at the same time allowing a practitioner to enjoy a reasonable amount of leisure and freedom from anxiety. This is not purely a selfish outlook-from the patients' view point, an overworked and harrassed doctor is a bad doctor, unable to take an objective view and reach a good clinical assessment.

WHITHER SHALL WE WANDER?

By Jasper

This month I'm wandering around Hampstead. It's a very tricky business deciding where to go, for Hampstead is full of pubs and eating houses, and it's well worth a visit. For those who live neither in Hampstead or Chelsca but want to see how the other half lives, go to Hampstead. For a start its got the Heath, and the Everyman for avant garde film goers. In the evening it may be difficult to tell the sexes apart, but you soon get used to it and I assure you they rely on us going and looking at them for their existence.

Start in the **William IV** in Hampstead High Street, about fifty yards down from the station on the right. This is a Courage pub with beer at 2s. a pint and has three interconnecting bars. At lunch it is not very full, and sells very good sandwiches quite cheap. In the early evening it is not crowded and cosy; there are small cubicles around the bars. During the late evening the place is usually packed, and the service becomes slower. The decor is drab perhaps, but at least there are no gimmicks.

When you're bored with this pub move on to one which is a little more varied. Up Heath Street to Whitestone Pond and just past on the left is the newly resurrected Jack Straw's Castle. This used to be a large and dingy place, yet always crowded. Then it was pulled down and replaced by the mammoth building photographed here. With the new plushiness it must have lost much of its original clientele, but it is well worth a visit. There are a variety of bars on the ground floor, all oak panelled and well furnished. There is a terrace looking West and a restaurant. But more is yet to come; two floors up, (a lift is provided for the weary), sits the turret bar which is really very posh. Situated in a corner of the building it overlooks that part of Hampstead Heath which seems to have become separated from the mainland, the North-West corner; very



Jack Straw's Castle.

pleasant. Returning to earth again, you'll find Charringtons at 2s. 2d. a pint (I'm sorry) and you won't be able to resist putting a penny in the ancient music-box that stands in the Wat Tyler bar and listen to the wierd music of vesteryear.

I hope these two pubs delight you; they are not representative of Hampstead pubs, but it would be impossible to choose two that were. Later in these series I will return there and add a little more to the picture of Hampstead drinking.

SOME CONTRIBUTIONS OF RADIOBIOLOGY TO RADIOTHERAPY

By Patricia J. Lindop

Soon after the discovery of X-rays and radioactivity, over 60 years ago, clinicians were exploring the use of radiation for the treatment of many conditions. Their use was based on the

observations that exposure of tissues to ionizing radiation produced an inflammatory reaction, and exposure to higher doses destroyed tissues by killing cells and shutting off the local blood supply. The aim of the radiotherapist has been to use radiations to destroy the capacity for tumour growth without inflicting unacceptable damage on the healthy tissues. Ionizing radiations are, however, as unselective as the surgeon's knife or the cytotoxic drug, and pre-cision of dose delivery to the tumour tissue has been the radiotherapist's plea to the physicist. But even with the most up to date physical facilities much of radiotherapy is based on an empirical evolution through clinical experience. In this way, better treatment of the same sort is likely to be achieved, but no real breakthrough in the treatment of malignant disease. A more fundamental understanding at the molecular biology level of the cancer cell, and the interactions of ionizing radiations with these biological complexes, may however lead to better specificity of the cell killing effect of radiations confined to the malignant cell. Radiobiology has already shed some light on these problems.

Cell survival curves.

Although a tumour's response to radiation exposure is a complex reaction depending on stromal reaction, host conditions, hormone

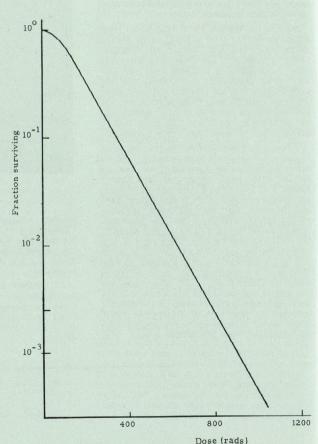


Fig. 1.—A cell-survival curve, determined for cells in vitro by the "Puck" (Puck and Marcus, 1955) technique.

balance, mode of growth in relation to blood supply, type and distribution of tumour, it has, over the past 10 years, been shown that the chance of "curing" a tumour depends on the destruction of the neoplastic cell's ability to divide. Fortunately this loss of reproductive integrity of a cell is a sensitive and easy end point to determine in relation to radiation dose. A cell can, however, only display this type of damage if it attempts to divide. Thus, cells of the central nervous system, muscle or the liver which do not normally divide are by this criterion insensitive to radiation; actively dividing tissues such as the bone marrow. lymph nodes, and epithelium of the gastrointestinal tract are relatively sensitive. In the same way a tumour growing rapidly as the result of cell division is likely to respond to radiation more dramatically than the slow growing tumour.

Ionizations taking place in a cell during radiation exposure will either directly or by some feedback mechanism disrupt the genetic information of the cell, making division go wrong or fail at the next or subsequent mitoses. The chances of the ionizations being effective increases with dose, in such a way that for each increment in dose, the same proportion of cells are damaged. If a population of cells, growing in tissue culture is exposed to radiation, then the proportion of cells which will subsequently divide indefinitely to produce a visible colony or clone will decrease with increasing dose in an exponential fashion (Fig. 1).

There are several characteristics of such a curve relevant to radiotherapy. Over a large range of doses and survival fractions the line is straight, and can therefore be characterized by its slope, which defines the population sensitivity. Alternatively it is characterized by the dose needed to reduce the surviving population to a given fraction, e.g., 37 per cent. This is called Do. Mammalian cells grown in vitro have the same radiation sensitivity when exposed in air, with Do ranging between 50 and 165 rads, independent of chromosome number, whether diploid or aneuploid, independent of tissue of origin, whether normal bone marrow. human kidney, mouse tumour or human tumour. It is difficult to relate such a similarity in radiation sensitivity between cells, with the clinical observations of markedly different responses of tumours of different types to the same dose, or even of the same tumour in initial and subsequent courses of radiotherapy.

The answer does not lie in the artificial conditions of "in vitro" cell sensitivity determination, since the survival curves have been repeated on "in vivo" systems in the mouse for

both normal tissues, such as bone marrow stem cells, and tumour tissues of several strains of leukæmia, and a solid sarcoma (Hewitt, 1961)

The curve in figure 1 is characterized also by a "shoulder" at the low doses. This implies that at low doses the accumulated damage is not great enough to destroy the reproductive integrity of the cell, and this is a "threshold" phenomenon. Technically the shape of this shoulder is difficult to determine, but its importance will be seen in the discussion of fractionation procedures. Because the shoulder leads into an exponential curve, it has tempted the more mathematically minded to extend the straight line portion of the curve back to the ordinate. The point where it crosses the ordinate is called the "extrapolation number". This extrapolation number has been used to express either the size of the biological "target" which must be hit to produce an effect, or the number of "hits" necessary on a single target (Lea, 1955). An extrapolation number of unity, implies a single event being effective with no recovery of sublethally damaged cells, and a high number implies a multi-hit event. A point to determine is whether any one of these characteristics is consistently different in tumour cell systems in contrast to normal tissues, so that radiation treatment patterns could be organized to take advantage of such a difference.

The oxygen effect

Throughout radiobiology it has been demonstrated that the presence of oxygen enhances the effect of radiation and its complete absence can protect biological systems by a factor of about 3. This is shown in a cell survival curve (Fig. 2) for mouse tumour cells, where curve A shows the survival after irradiation in the presence of oxygen, with a D_0 of 145 rads, and B shows the curve displaced to a higher D_0 value for D_0 of 475 rads after irradiation in the presence of nitrogen. Such a dependence of radiation sensitivity on oxygen tension has been shown in many systems from viruses, through cells, to whole animals, and follows the classic curve of Deschner and Gray, 1959, (Fig. 3).

In terms of cell survival after a given dose, i.e., chances of cure of a tumour, such an effect is very important. Many tumours grow without their own blood supply, and rapidly outstrip the oxygen available from surrounding vessels; others produce poorly developed or abnormal vessels without vasomotor control, and dependent on local pressure conditions which may cause stasis or collapse. Such architecture leads to areas of low oxygen tension in the tumour, as evidenced by local necrosis. The cells at this low oxygen tension are protected against the

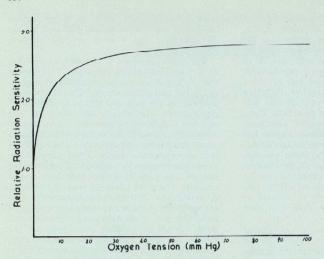


Fig. 2.—Survival curves for Ehrlich's ascites tumour irradiated in the presence or absence of oxygen.

effects of radiation, and to produce the same degree of cell eradication, the dose must be increased threefold, which would produce unacceptable damage to the surrounding tissues. Detailed studies have also shown that these hypoxic cells on the fringe of a necrotic area are still capable of division.

An obvious way around this problem is to try to raise the oxygen tension of these cells to maximum sensitivity. On the Deschner and Gray curve, this would not increase the sensitivity of the normal tissues which are normally at maximum radiation sensitivity, but would increase the sensitivity of the malignant hypoxic cells. This was the principle underlying the high pressure oxygen therapy started by Churchill-Davidson at St. Thomas's Hospital in 1954, (Churchill-Davidson, Sanger, and Thomlinson, 1955). Because hemoglobin is normally 98 per cent saturated, the only method of increasing oxygen transport to the tissues is by increasing the volume of dissolved oxygen. Patients were initially given oxygen to breath at four atmospheres absolute during radiotherapy, and in 7 out of 8 cases examined histopathologically, objective measures showed an improved response of the tumour to radiation in oxygen. The work has continued over the past few years using three atmospheres absolute, as in this case the patients need not be anæsthetised; and other centres at University College, London, and Portsmouth, as well as a large

group in Australia are using high pressure oxygen as an adjunct to radiotherapy.

Although the clinical results are good in many cases there are disadvantages in this method. It is difficult in a poorly vascularized tissue to ensure that every cell is raised to maximum sensitivity, especially if the supply vessel collapses under pressure. There is also evidence accumulating to show that even normal tissues, especially skin, bone marrow, bone and cartilage have some areas of low oxygen tension, so that normal tissue reaction may also be increased.

One method of avoiding some of these problems is to perfuse the tumour locally with hydrogen per-

oxide. This has been shown to increase the radiation sensitivity of anoxic mouse tumour cell systems (Berry and Andrews, 1964). oxygen cathode measurements in cat and rabbits showed the time course of the rise of oxygen tension. Both in the States, and in this hospital, local perfusion with hydrogen peroxide has been used, and oxygen tension measurements in the tumour show the marked rise achieved as long as a high rate of perfusion was maintained (Fig. 4). The disadvantages of this method are the difficulty of localizing the vessels to the tumour well enough to give a discrete perfusion, and also the infusion itself causes vasospasm.

Hydrogen peroxide infusion has also been shown to cause preferential localization of radioactive isotopes in malignant tissue which after further investigation may have potential application in the treatment of malignant tumours by internal irradiation (Finney and others, 1964).

The use of hypoxia.

An alternative approach to the problem would be to take advantage of the good blood supply of the normal tissue, and to reduce the oxygen tension of the normal tissue rapidly, and thus protect it, within a timescale which would not have reduced the oxygen tension in the poorly vascularized tumour. In this way, three times the normal dose could be given, thus killing the hypoxic cells of the tumour, and inflicting only the conventional damage

on the surrounding normal tissue. It is possible in large animals by hyperventilation with nitrogen and carbon dioxide to reduce the oxygen tension to extremely low levels within three minutes (Cater, Hill, Lindop, Nunn and Silver, 1963). This direct whole-body approach is unlikely however to be feasible clinically, because the myoglobin in muscle acts as a lower tension oxygen donor and maintains, even in conditions of oxygen washout, an appreciable tension. Even if the whole radiation dose could be delivered within a minute by a high energy accelerator, one runs the risk of inadequate hypoxia within this time scale, which should not be increased beyond four minutes because of possible cerebral or cardiac hypoxic complications, especially in poor risk patients. Adjuncts to hypoxia to protect the brain and heart, such as hypothermia and hypotension are also being investigated.

St. B.H.J., September, 1964.

A possible use however could be for the treatment of brain tumours, if a skull flap could be made to avoid treatment through overlying skin, muscle and bone. This would be a complex but probably justifiable procedure, in the light of the response of some brain tumours to radiotherapy. This is the sort of combination of surgery and open irradiation envisaged by Dr. F. Ellis in the design of the 35 MeV accelerator suite with direct connections via a sterile corridor to the operating theatres at the Churchill Hospital at Oxford.

Producing hypoxia in the region of the tumour rather than whole-body has many practical advantages. Suit, H., 1964, in Texas has irradiated several limb tumours after the application of a tourniquet to occlude the blood supply. In these cases some necrosis occurred, may be due to the intrafemoral blood supply not being occluded by the tourniquet, and also to differential rate of fall of oxygen tension in different tissues in the treatment area. Giving twice the normal dose, however, he clearly demonstrated protection of the normal tissues to the radiobiologically predicted level. Under these conditions of limb hypoxia an appreciable amount of oxygen diffuses into the skin, and fuller protection can be achieved if the limb is enclosed in a polythene bag through which nitrogen is continuously passed. In regions where tourniquets cannot be applied, regional perfusion with a zero oxygen content perfusate can reduce the oxygen tension to extremely low levels, (Lindop and Taylor, 1962). The advantage of such a method is that irradiation treatment can then be applied in the presence of local chemical sensitizers to radiation. Methods of protecting the lung from radiation pneumonitis by ventilating the lung

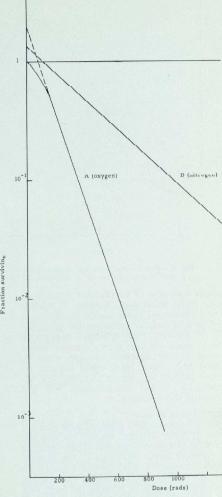


Fig. 3.—Dependence of cell radiation sensitivity on environmental oxygen tension.

with nitrogen during exposure are being investigated on dogs in this hospital.

Another way of getting round the oxygen effect is to use heavily ionizing particles such as neutrons, or π -measons, whose radiobioligical effect is much less dependent on local oxygen tension. This puts the ball back into the physicist's court, to produce a uniform, well defined beam of π -measons at a high

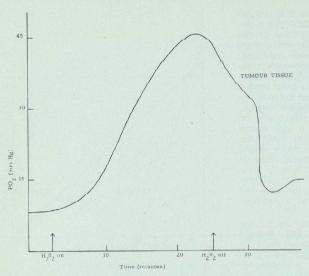


Fig. 4.—Tissue oxygen tension measurements during hydrogen peroxide perfusion of a neoplasm of the tongue.

enough dose rate to be clinically efficient. A factor to be determined, however, is whether during irradiation under anoxic conditions or with heavily ionizing radiations the phenomenon of recovery from sublethal damage on which repair of the normal tissues would depend, is still operative. Recent work by Elkind and others, 1964, would indicate recovery under hypoxic conditions, but an appreciable oxygen concentration was still present in this investigation.

Fractionation of dose

Radiotherapists have practised dose fractionation in many different regimes through the years. In this way it has been found possible to deliver a larger total dose to the tumour, without producing unacceptable reactions in the surrounding normal tissues, nor making the patient too sick by flooding the body with the toxic products resulting from massive cell death. Fractionation works, but many of the newer methods of treatment are complex enough to call for treatment in the fewest number of fractions possible. It is therefore up to the radiobiologist to explain the findings of fractionation therapy, and give a quantitative estimate of how the doses need be adjusted if the pattern of fractionation is altererd. Such studies have also brought into question whether fractionation is in fact the best method of treatment.

Returning to the cell survival curves, in Fig. 5 for example, it can be shown that if a single dose of 1000 rads is given, the surviving proportion will be 0.04 per cent. If, however, the dose is split into four fractions, the first 250 rads reduces the surviving proportion to about 20 per cent, but the second survival curve takes off from this point with a shoulder exactly like the first, and the surviving proportion after the four fractions is 0.25 per cent, which is in fact about six times higher than for the same dose given in a single exposure. This has been clearly explained by Elkind and Sutton, 1959, in terms of a recovery process at low doses. They have also

constructed modified survival curves to take into account fractionation schedules, employed clinically. It is evident, however, that on a survival cell curve basis the procedure which spares the normal cells will also spare the tumour cells. If, however, the shoulder were larger for a tumour cell population because of a higher proportion of anoxic cells, or because of a higher extrapolation number, then the greater the number of fractions given the greater advantage would the tumour tissue have. If the normal tissue shows the greater recovery capacity, then the larger the number of fractions the greater the likelihood of killing the tumour.

Fractionation may also act at a physiological level. In a large tumour, a proportion of the cells are anoxic, the first fraction of radiation will therefore kill off the most sensitive, i.e., the well-oxygenated cells. The tumour will decrease in size bringing into a region of higher oxygen tension the previously anoxic cells, which can then be hit by the second radiation fraction. That such a physiological change occurs has been shown by tissue oxygen tension measurements whilst breathing oxygen at normal pressure, before and after different fractions of a course of radiotherapy, (Cater and Silver, 1960).

Radiobiological experiments on the effects of different fractionation treatments on complex normal tissues, such as skin, compared with whole tumour systems, such as spontaneous mammary carcinoma are being carried out under different conditions of oxygenation, and using different qualities of radiation, or the same quality at different dose rates. When these data are put together with the findings of the retrospective survey of the Fractionation Working Party of the British Institute of Radiology, some interesting suggestions for optimum programmes of treatment should be forthcoming.

New approaches

Radiobiology is, however, looking for a fundamental way to increase the sensitivity of the tumour cell, or decrease the sensitivity of the normal tissues. One of the first chemical sensitizers used clinically was Synkavit. It was found that this localized in and increased the sensitivity of the tumour tissue, without necessarily influencing the

oxygen tension (Mitchell, 1960). Local vasodilating agents have also been used to raise tumour oxygen tension, but these are only effective where the tumour derives its blood supply from the normal vasculature around.

A newer exciting group of chemical sensitizers are base analogues such as 5-bromo or 5-iodo uracil which become incorporated into the DNA of the cell during cell division. Kaplan and others, 1962, have shown that these halogenated compounds sensitize cells to radiations whether in oxygenated or anoxic conditions. It tends to decrease the "shoulder" of the cell survival curve, and thus the sublethal damage. The advantage of such a sensitizer becoming incorporated in a rapidly growing tumour is evident. The difficulties at the present time are that the sensitization is

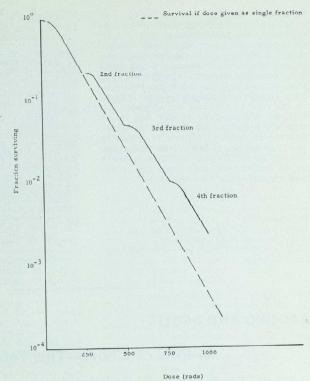


Fig. 5.—Cell-survival curves comparing the effects of a single dose with 2, 3 or 4 fractions.

only effective if a large proportion of cells contain the analogue, thus to get optimum effects the tumour cells must be stimulated to divide in synchrony allowing one or two cell divisions before treatment. The possible increased risks of metastases from a stimulated tumour must be considered. Also the liver removes the halogen from the analogues, so at present clinical application is limited to tumours accessible to intra arterial perfusion.

Little has been achieved so far in chemical protection for normal tissues. Most of the efficient agents act by lowering of the oxygen tension, and those that specifically protect by the sulphydryl group such as cysteine, or AET (S-2 aminoethylisothioruorium bromide hydrobromide) are only effective near their pharmaceutically toxic dose.

Summary

Radiobiology is a young subject, but has so far found some fundamental explanations for the success of the somewhat empirical development of radiotherapy. From fundamental knowledge of interaction with tissues, new approaches have been suggested, several of which are being tried, but one feels that this is just the beginning. Treatment of malignant disease is based on the need to eradicate the neoplasm and stop its metastasizing, to this end many traumatic procedures are justified. One looks, however, to ionizing radiation as a delicate tool to disrupt at a molecular level the enzymes involved in cell division, and thus to give a discrete method of controlling the growth without gross tissue distruction.

References

BERRY, R. J. and ANDREWES, J. R., 1964, Ann. N. Y. Acad. Science, 44, 1.
CATER. D. B. and SILVER. I. A., 1960. Acta Radiologica, 53, 233.

CATER, D. B., HILL, D. W., LINDOP, P. J., NUNN, J. F. and SILVER, I. A., 1963, J. Appl. Physiol. 18, 888.

CHURCHILL-DAVIDSON, I., SANGER, C., and THOMLINSON, R. H., 1955, Lancet I, 1091. DESCHNER, E. E. and GRAY, L. H., 1959, Radiation Research, 11, 115.

ELKIND, M. M., and SUTTON, H., 1959, Nature Lond. 184, 1293.

ELKIND, M.M., ALESCIE, T., SWAIN, R. W., MOSES, W. B. and SUTTON, H., 1964, Nature. Lond. 202, 1190.

FINNEY, J. W., COLLIER, R. E., BALLA, G. A., TOMMF, I. W., WAKLEY, I., RACE, G. J., WINSCHEL, H. C., D'ERICO, A. D. and MALLQUIS, J. T., 1964, Nature, 202, 1172.

HEWITT, H. B., 1961, Lectures on the Scientific Basis of Medicine X, Athlone Press. KAPLAN, H. S., ZAVARINE, R., and EARLE, J.,

1962, Nature, 194, 662. LEA, D. E., 1955, Actions of Radiation on Living

Cells, Cambridge University Press.

LINDOP, P. I. and TAYLOR, G. W., 1962, Part II

BECC Annual Report 40th, p. 265.

BECC Annual Report 40th, p. 265.
MITCHELL, J. S., 1960, Studies in Radiotherapeutics, Blackwells, Oxford.

PUCK, T. T. and MARCUS, P. I., 1955, Proc. Nat. Acad. Sci., 41, 432.

SUIT, H. D., 1964, Radiation therapy given under conditions of local tissue hypoxia for bone and soft tissue sarcoma, (in press).

AROUND AND ABOUT:

6-Inns of Court-The Temple

By "Argus"

Quite squares and green lawns, hidden courts and passages, collonades, fountains, and sundials, all add up to the dignified whole that is the Temple. Turn off the rush and clamour of Fleet Street and you will find yourself alone in its deserted courts which seem to capture all the tranquility and beauty of an old university town. The heart of the Temple was torn apart by the destruction of the war and its character perceptibly changed. New buildings have been erected which reproduce the old style, but it will be some time yet before their rawness wears off and the brick weathers. Only then, perhaps, will the Temple regain its old glory.

The Temple of Solomon in Jerusalem gives the Inn its name. The crusading order of "the Poor Knights of Jesus Christ and of the Temple of Solomon" (the Templars) established

their first English House at Holborn and subsequently acquired the strip of land by the river where the Temple now stands. Here they moved from Holborn in 1160, completing the famous Round Church, a model of the Church of the Holy Sepulchre at Jerusalem, in 1185. The order, becoming too rich and powerful besides being suspected of heresy, was suppressed in 1308, and by 1324 the buildings were in possession of the Knights of St. John who in their turn leased the property to men "of law expert and curious" as Chaucer called them. At the dissolution of the monasteries the Temple became Crown Property, but in 1608 James I leased it to the Benchers of the Inner and Middle Temple. No visible division exists between these separate societies but the Temple still retains its extra-territorial status.

Although partly within the City boundary the Lord Mayor cannot enter its precincts for the Benchers have never admitted his jurisdiction.

To appreciate the Temple best one should enter it by the Middle Temple Gateway, an impressive classical building of 1684. Here can be seen the seal of the Middle Temple, the Agnus Dci (The Lamb of God) with a flag. (The seal of the Inner Temple is Pegasus, the winged horse). Just inside the gatehouse on the left is a quaint old shop formerly used as a publishers and a post office from the time of George I until the introduction of the penny post. Behind the gateway are some old chambers of 1693. Their oversailing upper floors are reminiscent of a much older building. Passing a rather dull Victorian block, Middle Temple Lane opens out on the right into Brick Court-so called because it was the first brick building in the Temple. The square was originally divided into Brick and Essex courts by a central range destroyed in the war. At No. 2 Oliver Goldsmith lived until his death in 1767 and wrote "She stoops to Conquer". Beneath him lived William Blackstone, author of the classic "Commentaries on the Law of England." While working on this book Blackstone used to be much disturbed by the noisy parties that Goldsmith held for his young friends in his rooms above. Brick Court is rather spoilt by the dull heavy Victorian neo-Tudor building on its north side. The fine western range was built by Dr. Barbon (son of 'Praise God Barebones') in 1677, and from it a passage leads to New Square. The chambers here were built to Sir Christopher Wren's design. The impressive stuccoed building on the right is not part of the Inn itself. New Court opens out down shallow steps into Fountain Court, the most tranquil spot in the Temple, shaded by old trees with its gently splashing fountain and view over trim lawns to the river. The Fountain dates from 1681 and the essavist Lamb mentions its single jet, "which I have made to rise and fall how many times, to the astonishment of the young urchins, my contemporaries, who not being able to guess at its recondite machinery, were almost tempted to hail the wondrous work as magic." The old building to the South, buttressed and with mullioned and transomed windows is Middle Temple Hall. It was built between 1562 and 1572 and opened by Queen Elizabeth I in person. Mercifully it survived severe damage in the war, although it had undergone restoration and various bits had

been added to it over the years. The interior contains a magnificent double hammerbeam roof and a spectacular carved Elizabethan Screen. The names of all the readers and treasurers are inscribed on the panelled walls while above are portraits of the Kings and Queens of England. The hall was the scene of one of the earliest performances of "Twelfth Night" or "What you Will" in February 1602.

The hall faces on the north side, the backs of the chambers in Brick Court. High up on the wall is one of the Temple's three sundials with the motto 'Discite justitiam moniti' (Learn justice you who are now being instructed). There has been much rebuilding in Middle Temple Lane since the war, Lamb and Hare Court buildings for example are new. As a contrast it is worth wandering down to the bottom of the Lane to have a look at Temple Gardens building. This is a Victorian pile of 1876 in a style as rich and heavy as a Christmas cake. The whole of the exterior is covered with elaborately fashioned projections, mouldings, figures and caryatids—a complete break with the dignified features of all the other buildings in the Temple.

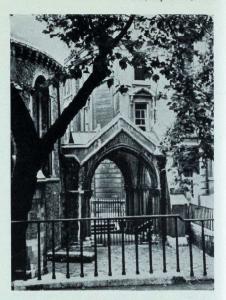
The modern buildings, Elm Court and Crown Office Row for example, reproduce the old style of chambers existing before the war. In some of them, however, the outlines of the windows and the thickness of the sash glazing bars have been altered to produce the effect of heaviness instead of delicacy and grace. Crown Office Row was Lamb's birth place, "a man would give something to have been born in such a place". Thackeray lived here as a not too successful lawyer for nine years until 1857.

Above Elm Court is an archway leading into Pump Court, one of the oldest and certainly the most pleasant of all the courts in the Temple. The south side has been rebuilt but the north is original and still retains its sundial inscribed 'Shadows we are, and like shadows depart' and the date, 1686. Henry Fielding lived here in 1737, as well as the poet Cowper-it is extraordinary how rich are the literary associations of the Temple. Readers of "Martin Chuzzlewit" will recall that it was here Tom Pinch lived and catalogued books for the mysterious Mr. Fips, after his dismissal from Pecksniffs. The east end of Pump Court is bounded by the cloisters—a covered space similar to that at Lincoln's Inn but with regular rows of Tuscan columns. Standing here on the right is the heavy square neo-Georgian Inner Temple Hall and on the left the Temple Church.

The Temple Church is one of five circular churches in England and is also a 'royal peculiar'—that is it has letters patent from the Crown. The nave and porch were constructed in 1185, and the chancel constructed between 1220 and 1240. The Victorians with their passion for rebuilding made many alterations in 1841. It was badly damaged in the war and has now been restored to its original glory. Apart from its circular shape the nave is peculiar in being a mixture of pure Norman and pure Gothic. The most interesting feature of this part of the church is the grotesque, carved heads which run round the walls, at eye level. Each one is worth studying for its peculiar distorted expression—one of the heads is having its ear chewed off by a tiger! The effigies are of the 12th and 13th centuries but do not represent Templars. The crossed legs intended to indicate repose and making the sign of the Cross in death are an odd feature. The Chancel is beautifully proportioned giving an impression of openness but at the same time discipline. The elegant reredos at the East End was carved in 1682 under Wren's supervision: its Classic form blends well with the Gothic chancel. Behind the church are the remains of a graveyard, containing several memorials. The stone inscribed with Goldsmith's name is not his grave; where exactly he is buried is unknown.

Lamb had rooms in Inner Temple Lane the back windows of which overlooked "a gloomy churchyard like court, called Hare Court with three trees and a pump in it." There is no pump in Hare Court now and although largely rebuilt in the last century it is still a gloomy hemmed-in place. It contained the chambers (No. 2) of the infamous Judge Jefferies of "Bloody Assize" fame. Inner Temple Lane leads to Inner Temple Gateway of 1610—the finest piece of half timberwork in London. The rooms above with their oriel windows overhang the archway. On the first floor is Prince Henry's room with its elaborately decorated plaster ceiling.

Returning to the church and leaving Tanfield Court with the fine Master's House on the left, a replica of the original of 1667 set in a beautiful garden, one emerges into King's Bench Walk, the upper range of which was laid out by Sir Christopher Wren. Standing at the top of the walk a magnificent view opens out to the Thames with the dignified



The Temple Church

Row framed by trees to the left. The houses all have heavy ornamental gateways in brick instead of the usual stucco—that of No. 5 with its Corinthian pilasters is particularly magnificent. Here Lord Mansfield the famous 18th century judge of whom it was said 'Persuasion tips his tongue whene'er he talks' had chambers. The lower part of the range is of plainer construction, mostly late 18th and early 19th centuries. Facing King's Bench Walk are Paper Buildings. They replaced older chambers burnt down in 1838 when a noble judge who had had a more than unusually convivial evening got confused as to the relative functions of his bedside candle and chamber pot and put the candle under his bed!

Passing through an arch in Mitre Court Buildings, a gate leads into Serjeants' Inn which takes its name from the extinct office of Serjeant-Law. Several interesting old houses, including that of J. T. Delane the famous Victorian editor of "The Times", of whom it was said he saw more sunrises than any other man of his time, were swept away in the war. The Inn itself has been rebuilt in a heavy neo-Georgian style.

The Temple is full of history but it is the charm and tranquillity of the place that is so attractive. Dickens knew this when he wrote in "Barnaby Rudge", "There are still worse places than the Temple on a sultry day, for basking in the sun or resting idly in the shade. There is yet a drowsiness in its courts and a dreamy dullness in its trees and gardens; those who pace its lanes and squares may yet hear the echoes of their footsteps on the sounding

stones, and read upon its gates in passing from the tumult of Strand or Fleet Street, "Who enters here leaves noise behind". There is still the splash of falling water in fair Fountain Court, and there are yet nooks and corners where dun haunted students may look down from their dusty garrets, on a vagrant ray of sunlight patching the shade of the tall houses, and seldom troubled to reflect a passing stranger's form".

THE OLDEST HOSPITAL IN ENGLAND

By N. J. M. Kerling

Is St. Bartholomew's Hospital the oldest hospital in England? This question is so often asked that it seems worthwhile to find the right answer. It all depends on how one words this question. If one asks: "Is this hospital the oldest surviving hospital foundation in the country?" the answer, I am afraid, must be "No"

In the 11th and 12th centuries a number of hospitals were built in different parts of England. Sometimes they were attached to a religious house, sometimes they were founded by private people. Among the long list of these foundations one finds houses or hospitals for old people and hospitals for the poor and sick like our own hospital. Most of these institutions, however, were dissolved at the time of the Reformation in the middle of the 16th century. Of those which still exist, only four were founded before 1123, the year of the foundation of this hospital, namely: St. John's Hospital, founded before 1089, in Northgate, Canterbury; St. John's Hospital, Cirencester, Glos., which was founded at about the same time as our hospital; the Hospital of St. John the Baptist in Ripon, Yorks., which was founded between 1109 and 1114 and the Hospital of St. Bartholomew in Rochester, founded in 1078 by Gundulph, Bishop of Rochester, for poor people, and lepers.

The first three houses were not meant for poor sick people but only those who were poor and old were allowed to live there during the remaining years of their lives under the supervision of a Master and a Chaplain. In the course of their history these three institutions each built a number of almshouses for old people on their original site which are still in use. They are administered by a Master as in Ripon, by a Council of Management as in Canterbury or by trustees as in Cirencester. St. Bartholomew's Hospital in Rochester also survived the time of the Reformation It was completely rebuilt in 1863 on a different site, where it still functions as a hospital.

Is our hospital the oldest surviving foundation? If one puts it that way, it has to be accepted that the hospital in Rochester, dedicated to the same saint, is older and that there are three other institutions called "hospital", which are also older though they are not hospitals in the modern sense.

One can, however, define the above question more precisely and ask whether this hospital is the oldest foundation in the country which is still functioning on the same site where it was founded and which has always been and still is a hospital for the sick. Only to this question can the answer be in the affirmative.

THE WAITING ROOM

By Rodney F. Crandell

(A Bart's patient)

The successful doctor, having passed his Bedside Manner Finals (see May issue) now goes forth into the big, wide world to start work in a practice. So that he may not appear too green, here is an example of a normal Waiting Room at a surgery somewhere in the suburbs.

It is a large, gloomy room with an assortment of chairs from every period and in every condition. A few women's magazines lie scattered around, slowly and quietly deteriorating from many years of handling. On the wall is a large poster, curling at the edges, pointing out that for every cigarette you smoke you may (note the careful wording!) be increasing your chances of Lung Cancer. Stuck to the bottom of this notice with brown and crackly sellotape is an annoucement to the effect that Dr. Smith will hold an ante-natal clinic every Wednesday from 10.30 to 11.45 a.m. until further notice.

On the window-sill is a large wooden tray with little piles of neatly typed letters, cards and prescriptions, all waiting to be collected. A vase of flowers wilts over the tray in one corner of the window, spreading a light dusting of pollen upon the papers. The window really needs cleaning.

No matter where you go, young and ambitious doctor, this is the room that waits for you in every town and village in the land.

But what of the patients—the inhabitants of this sombre place, and where is that little receptionist who scurries vaguely round, in between her typing, trying to keep the patients in order? The old clock on the edge of the mantelpiece slowly ticks the seconds away, coughs and whirrs like some asthmatic pensioner, sonorously chimes nine times, hiccups, and gently settles down to a steady tick again.

A scuffling at the front door heralds the appearance of a young girl with blonde hair. She scuttles hurriedly through the room and into the surgery. Seconds later she emerges in a white coat, notebook in hand, ready to let in the patients.

The first patient to arrive is a large buxom woman carrying many parcels, and a large shopping bag. "Mornin' ducks. First again I see," she greets the receptionist with a smile,

sits down, and carefully arranges her parcels. "Have you got your bottle, Mrs. Smith?" asks the receptionist. Mrs. Smith hurriedly starts searching amongst her baggage. Whilst she is doing so, in comes a very spotty little girl with her mother. "Good morning" says the receptionist, "may I have your name please?" "Primrose Clark," replies the little girl. "Mummy, what is that lady doing?" "Hush dear, and read your comic."

The white-coated, blonde receptionist reenters, collects the bottle from Mrs. Smith, and a daintily wrapped specimen from a rather superior lady, and returns through the door again. The rather superior lady looks from the child to the mother: "Does your child have to scratch all the time?" "I'm afraid so, it's this wretched rash she's got... Don't scratch dear!" "I can't help it mummy, I itch!" The r.s.l. moves away to the other side of the Waiting Room, joining Mrs. Smith.

Mrs. Wallop and a rather deaf lady both come in together. The receptionist pops through the door, and greets the deaf lady first. "Good morning, have you brought a specimen?" "Eh?" "Have you got a bottle?" shouts the receptionist. "Here it is, you don't have to shout you know!" The deaf lady and Mrs. Wallop hand over their bottles to the receptionist together, who takes them away.

Now the waiting room begins to fill up rapidly, with a varied collection of people. Businessmen popping in on their way to the office, trying hard to pretend that they are not there at all; more women with shopping baskets; two schoolboys looking pleased at having a legitimate excuse to stay off school: and an old woman with a stick. Conversation lapses, and they all sit, waiting, reading the magazines, or staring gloomily into space. Waiting—waiting for you.

This is the sight that greets you, oh new and fresh-fledged Doctor, as you open the door and stride purposefully through the room gripping your little black bag. Look neither to left nor right, shut the surgery door carefully behind you, sit down, and press the little buzzer. The door handle rattles. Good Luck Doctor. Your first patient is about to enter!



The Christmas Card, 1964

Christmas Card Order Form.	Please use BLOCK CAPITALS
NAME:	No. of cards required
ADDRESS:	Cost at 4s. per doz£ s. d.
	Plus postage, 1st doz. 9d.
	additional doz. 4½d. (Orders over 5 doz., post free)
	Total £ s. d.

Please enclose remittance with order, addressed to The Manager, The Journal, St. Bartholomew's Hospital. London, E.C.1. Cheques and P.O.'s payable to St. Bartholomew's Hospital Journal.

Signed

FIFTY YEARS AGO

From the Bart's Journal of September, 1914

EDITORIAL NOTES

Party politics and civil strife, the failure of the conference at Buckingham Palace, a riot in Dublin—these were the dark clouds upon our horizon when last we went to press. Field hospitals were being equipped, men were volunteering—for service in Ulster.

Now all these things have merged, dissolved, and changed as the colours of a child's kaleidoscope, and the Great War is upon us. Many of us have expected it for years, but, even so, it has come at a time and with a suddenness that we had never dreamed.

It behoves us now to realise.

With martial ardour we are offering our lives and services; every one is anxious to be at the front in this great crisis of the world. Even now we do not realise what all this means. It is necessary for us to remember that this is not a dream; that the world rolls on; that men and women are dying of vulgar diseases; that babies are entering upon their maelström careers in the East End and in Mayfair. If we all spring to attention and march to the rolling drums, who will be left to do the daily round, the necessary common task?

Let all be prepared; let all learn those things that may be necessary should they be called upon; but let a few remember that a man may do his duty by resisting the natural desire to enter the limelight with as much certainty as others may do it beneath the glare.

This is no time for heroics, but for commonsense. The noblest motto we can take as ours is that which the Black Prince assumed nearly six hundred years ago—Ich dien.

Service is required of us all, but the manner and place should be most carefully considered.

SPECIAL WAR NOTICE

The St. Bartholomew's Hospital Women's Guild

The Guild has undertaken the work of supplying the necessary bedjackets, nightshirts, and other things for use in the Territorial Base Hospital, known as the First London (City of London) General Hospital, which is being administered by the Staff of St. Bartholomew's Hospital.

All who are willing to work are asked to communicate with Miss Gask at the Hospital.

The Guild also requires every sort of comfort for the wounded and sick, among which the following articles are especially required.

Bath-towels, bed-socks, ordinary socks, pocket-handkerchiefs, down or soft cushions (with washing covers if possible), air-cushions and air-rings (size 22 ins. red rubber), rubber hot-water bottles, water-beds, felt slippers, scarlet blankets or Guard's rugs, folding deck or cane chairs, writing paper, envelopes, pens, pencils. ink. blotting paper, magazines and books, wall clocks, games (draughts, dominoes, patience cards, etc.), tins of meat extract (Bovril, Virol, etc.), cocoa, eating chocolate, toilet soap, small mirrors, brushes and combs, clothes brushes.

And for sick officers' quarters: Small trays and tray-cloths, soup bowls, small cruets, serviette rings, bedside carpets, bedside tables, bedrests, small clocks for separate rooms (the "Bee" Clock does excellently), hand-bells, ashtrays, flower-pots and plants, inkstands and blotters, linen pillow cases, beds, mattresses, bed-clothes.

Pillows are also wanted for 109 orderlies.
Clothing should be sent direct to Miss Gask

at the Hospital.

All things other than clothes should be sent to Mrs. George Gask, at 41 Devonshire Place, W., who has kindly undertaken to receive them and send them on to the Base Hospital.

MONEY IS ALSO VERY MUCH NEEDED, AND IT IS HOPED THAT THOSE WHO CANNOT CONTRIBUTE IN KIND WILL FORWARD POSTAL ORDERS OR CHEQUES. These should be sent to Mrs. Jessop, 73, Harley Street, W.

With reference to clothing, there are two things which are specially required, viz., dayshirts and socks. In connection with the latter we may say that socks WITH HEELS are required. Many people seem to think that straight socks without heels are excellent, but experience shows that these are not so comfortable as, neither do they wear as well as, socks of an ordinary shape.

PENGUIN REVIEWS

The Great Siege, by Ernie Bradford. Penguin. Price 4s. 6d.

In 1565 Malta was besieged by the Turks, and this book is an account of the heroic defence of the

island by the Knights of St. John.

Soleyman the Magnificient, Sultan of the Ottomans, Allah's deputy on Earth, Conqueror of the East and West, sent his armada against the tiny island to punish the knights for their imprudent buccaneering raids on Turkish merchant ships. The Sultan's only previous deteat had been at Vienna in 1529, and he was confident that his fleet of 200 ships and 40,000 men would rapidly overcome the resistance of the 700 knights and servants-at-arms and 9,000 Maltese irregulars.

Malta had been presented to the Order by the Emperor Charles V so that they could "employ their forces and arms against the perfidious enemies of the Holy Faith," and the knights were dedicated to an eternal war against Islam, although the Order was primarily a nursing brotherhood, concerned with the welfare and defence of pilgrims to the Holy Land.

Mr. Bradford embroiders the background of the religious conflict which divided the mediteranean world into his account of the siege. The Christians and Moslems "each regarded the other as an infidel, the slaying of whom was the sacrifice most acceptable to the God they worshipped." Pope Pius IV promulgated a Bill granting plenary indulgence to all who fell in battle against the Turks.

Siege warfare was conducted according to the theory of the mediaeval military strategists and the conventions of chivalry. "It was generally recognised that, once a large breach had been made, it was up to the defenders to surrender. If they did so, they were entitled to the normal courtesies and might even be allowed to go free, or at any rate, be liberated by ransom money." But if they continued to resist, the defenders were not entitled to any quarter.

Since a siege was essentially a series of repeated assaults on an almost impregnable citadel, it is inevitable that an account of a protracted investment be repititious: "Time and again the attackers stormed across the ditch in front of the fort. Time and again they were beaten back." But Mr. Bradford has brilliantly combined the heroic quality of the epic with the detail of the documentary.

Maurice Lipsedge.

Franny and Zooey, by J. D. Salinger. Penguin. Price 3s. 6d.

Mary McCarthy has said that J. D. Salinger is as sincere as an advertising executive's neck tie. This spiteful criticism shocks the reader who has sympathized with Holden Caulfield in "The Catcher in the Rye" when he asks the uncomprehending taxi-driver where the Central Park geese go in winter when the lake freezes. Holden criticises his elder brother for going to Hollywood and selling his soul by writing commercial scripts. In Franny and Zooey Salinger commercially exploits the Greenwhich Village cocktail party affectation of interest in Zen

Buddism. His name dropping is not social but esoteric: "anahata", "chakra", "ajna". An inadequate style, plot, dialogue and theme are bolstered up by second hand Mu-Mon-Kwan, Sri Ramatkrishna, the Bhagavad Gita and even Marcus Aurelius. As the author says disingenuously on the first page "What I am about to offer isn't really a short story at all, but a sort of prose home-movie, and those who have seen the footage have strongly advised me against nurturing any elaborate distribution plans for it." Unfortunately he has ignored the advise.

Suzuki wrote that the aim of Zen is to restore the experience of original inseparability, which means to restore the "original state of purity and transparence". Salinger's venture in mysticism is indeed

transparent, but where is the purity?

Maurice Lipsedge

The Essential Hemingway, by Ernest Hemingway. Penguin. Price 6s.

One of the things Hemingway does for his reader is to pick him up from past reminiscene, future speculation, and the remorse and anxiety that go with them, and throw him back where he belongs into the present. Life is good, let's eat, drink and be merry, not because tomorrow we die, (Que va—what if we do?), but because life is so darned good.

It is this vivid aspect which impresses one most when reading The Essential Hemingway. This book is a selection of his work, first published in a more expensive form in 1947, and includes one complete novel, (Fiesta), extracts from four others, and 25 short stories. So there is no question of not getting

your money's worth.

How representative is this anthology? Hemingway's work changed as he grew older. His early writing is full of tough humour, a materialistic zest for living. and a lurking cynicism. Fiesta (1927) was his first novel and contains all these elements in undiluted form; nobody can ever have been more capable of enjoying himself, from sophistication and debauch in Paris, to the exhilaration of a Spanish fishing holiday. But later on he became more seriously concerned with the individual and his problems, and his bitterness is replaced by a sad acceptance. This more mature aspect reached a climax in The Old Man and the Sca, which was not written until 1952 and therefore finds no place in this book, although it was uppermost in the minds of the judges when they awarded him the Nobel Prize in 1954. There is an extract from For Whom the **Bell Tolls** (1941), which to the reviewer's mind is Hemingway's best novel, showing both his faces, the sympathetic and the exuberant; but this passage about El Sordo on the hilltop was selected primarily for its suspense and its completeness out of context, and in some ways is not typical of the rest of the book.

This book is a good buy for two sorts of peoplethose who have not read any Hemingway before and want a good introduction to his work; and those who by borrowing from libraries or friends, have become experienced admirers, and would like to liave on their own shelves a reminder of many

happy hours.

Michael Downham

THE MEDICAL PROTECTION SOCIETY

ADVICE · DEFENCE & FULL INDEMNITY FOR DOCTORS & DENTISTS AT HOME & OVERSEAS Founded 1892

50 HALLAM STREET · LONDON · W.1

Secretary: Dr.H. A. Constable.

Tel: LANGHAM 9241

OTHER REVIEWS

Applied Anatomy and Physiology for Nurses, by Peter E. Sylvester, M.R.C.S.(Eng.), L.R.C.P. (Lond.), D.C.H. Blackwell Scientific Publications.

Dr. Sylvester's book is uncompromisingly addressed to a student nurse of intelligence and education. His treatment of his subject is in no sense basic or elementary. Some authors ask about their material "Does the nurse really need to know this?", and if the answer is "no" they omit it, but Dr. Sylvester has included a great deal of information to which the graduate rather than the student might refer.

The author's interests are indicated by his distribution of space. The reproductive systems of both sexes are reviewed in 8½ pages, while 65 are allotted to the nervous system. The style is always direct and clear, and never comes between the reader and the meaning of the text. Difficulty arises sometimes from name dropping without explanation. The Christ-mas factor is mentioned once as being necessary for blood clotting, and unless some description is given, it hardly seems necessary to refer to it.

The illustrations are good, but many would benefit from being larger (e.g., Figs. 29 and 80); some are over-labelled (e.g., Fig. 130). The number of anatomy and physiology books available to student nurses is now quite large, but the demand is also a large one, and students of average and above-average ability will be interested in this well-produced text.

Food for the Diabetic, by Miss Winifred Hector. William Heinemann Medical Books Ltd. Price 6s.

The student reading through a medical textbook is apt to be discouraged by passages that are difficult to assimilate at a single reading. The passages concerned are the ones the reader finds unfamiliar or boring and any system capable of implanting them more or less painlessly in the mind would be worth looking at. It may be that in giving a firm grasp of subjects that proved difficult to memorize (of which diet for diabetic patients seems to be a good example if ward rounds and oral examinations are anything to go by) Programmed Learning can make a most useful contribution. The book is not to be read straight through but is arranged so that the path followed through it depends on how quickly the reader learns the facts he is given. At the foot of the page the reader's thoughts are brought to a focus by a question to which a choice of several possible answers is given and if he selects the correct one he can pass on, if the wrong one the error is explained and the reader is referred back as in a game of Snakes and Ladders. "Food for the Diabetic" covers the main kinds of food and their comparative costs, the construction of a diet and food values and exchanges. Whatever may be the future of this form of teaching, Miss Hector has done sterling pioneering service as its champion at K.B.

SPORTS NEWS

EDITORIAL

A recent article in a leading scientific journal* suggested that the position of sport in relation to leisure in our society was undergoing a marked change. No longer did an "afternoon's football" mean turning out to play for the local club but instead a weekly bawl at or for a professional league team.

In our own sphere it is therefore a relief to see that this change has not yet permeated through the Medical College. Students who partake in no sport whatever are few and far between, and we should be careful not to cavil at those who do not reach representative standards. Complaints that spectators at Bart's matches are rare, are common and often abusive and it is true that verbal support from any touchline is always of the greatest encouragement. Often, however, those who would spectate are playing themselves or are working and it is unusual for a student game or race to be really exciting to watch, so those who are not very keen can hardly be expected to give up their time to this pursuit. As the article made clear, spectating is not a useful leisure occupation and perhaps our attentions would be better directed at encouraging people to play rather than complaining that nobody comes to watch those who do.

* "Leisure in 1984" New Scientist.

CRICKET CLUB 4th July v. U.C.S. Old Boys. Drawn.

Bart's batted first on a very slow wicket against some uninspired bowling, and declared at 148 for 6. The weather was dull and it was in this mood that we took the field, consequently the game was one of the slowest of the season. At the close of play the score stood at 121 for 4. The only thing to enliven the day was the 'no balling' of J. R. Harrison from square leg for throwing—shades of Meckiff! 5th July v. Past Bart's. Drawn.

Inevitably Bart's batted first and after the openers N. Offen and J. Gately had been dismissed by A. Whitworth and D. Delaney respectively for very few runs, the score took a turn for the better. Declaration came at 235 for 6. H. Philips (Senior Professional) was very close to his century at the close, with 92. D. Husband made 67.

Dr. N. C. Oswald opened the Past batting

facing the menacing action of the Social Secretary D. Goldie. A fine boundary was struck through the 'short legs' off the first ball but Goldie claimed his victim off the fifth.

Bart's bowled well and steadily and at the close of play the Past were 156 for 9, the last pair remaining together for twenty minutes.

11th July v. Incogniti. Drawn.

Bart's took the field and after a good start we had them 28 for 2. An unbroken partnership then took the score to 177 for 2 declared. Bart's hatted well and maintained a steady rate. At the close we were 146 for 6, nearly but not quite an interesting finish. N. Griffiths 46 not

12th July v. Hampstead. Drawn.

Bart's batted first and were able to declare at 180 for 7. R. Higgs 33, R. S. A. Thomas 45 n.o., D. Husband 36. We then took the field but after only five overs torrential rain

stopped play for the day.

18th July v. Nomads. Drawn.

R. Higgs and N. Offen opened the batting and took the score to 72 before Higgs was caught for 43; a good opening stand. Offen went for 30 and H. Philips helped the score along with a cavalier 28. We were able to declare at 156 for 8. The Nomads were 52 for no wicket when once more rain ended play.

19th July v. Dartford. Drawn.

Again Bart's batted first with everyone scoring runs including D. Husband 40 and H. Philips 48. J. R. Harrison scored a fine six before, inevitably, being stumped. The total of 202 for 9 declared, seemed enough at the time Dartford batted well and fifteen minutes from the end were 182 for 1 and looked certain to win. Then their opener was bowled for 100 and with a rapid succession of runs out and catches they finished at 195 for 6, an incredible

22nd July v. Oxton. Drawn.

After losing a wicket in the first over Bart's batted steadily and were all out for 170. R. Higgs 49, N. Griffiths 32, D. Husband 29, H. Philips 28. Oxton then faced a very steady spell from our opening bowlers and in the first ten overs could only score 6 runs. This cost them the game. The first change of bowling brought the first wicket when Gately enticed a catch to the leg side field. After a fine display of batting they finished at 155 25th July v. Old Cholmelians. Won by 58 runs.

At last we broke the long spell of draws with a win. After a shaky start. 15 for 2. Bart's were eventually all out for 173. J. Gately 47, N. Griffiths 24. P. E. Savage—a commendable innings for an opening bowler. Bart's bowled well, and J. Gately kept very well taking four catches behind the stumps. We bowled them out for 115—the last wicket falling within seconds of time. C. P. Vartan 4 for 29.

BOAT CLUB

We had decided early in the year that if the 1st VIII was to be entered at Henley it would first have to beat the other Hospitals convincingly in the U.H. Bumps. Having failed to do this we were once again, therefore, faced with the decision whether to continue rowing as an eight, or to form a four which might be entered at Henley. The members of the 1st VIII had enjoyed rowing together and spirit in the crew was high, so it was with great regret that we decided to break it up and train a Light four instead. However we remained together until the Allom Cup Regatta.

Allom Cup Regatta May 16th

We entered the 1st VIII for the Roderick Hill Trophy. The 2nd VIII was also entered but had to be withdrawn as the crew was not complete. The members of the 1st VIII also formed a Light IV and a coxed IV which entered as well.

The 1st VIII drew Guy's Hospital in the first round, but unfortunately the latter withdrew, depriving us of the pleasure of beating them, so we went straight to the final in which we met the Royal Veterinary College and the London School of Economics. This was a very close, very hard race, but the former went up inch by inch all the way and beat us by one-third of a length, whilst L.S.E. were third.

In the Light IV we were drawn against Chelsea College in the first round. After the start the crews were level but Barts then began to pull away and went steadily up to win by $2\frac{1}{2}$ lengths. This was very encouraging as we had had only two outings as a four. In the final we met University College, a more experienced crew who beat us by 3 lengths

In the coxed fours the Bart's crew were rowing together for the first time on the day. They drew St. Mary's Hospital B crew, who withdrew, and were beaten by Mary's A in the 2nd round.

Crews

1st VIII—Bow M. Simmons, 2 M. Keighley, 3 J. K. Anderson, 4 W. P. Garson, 5 D. C. Parr,

6 A. N. Crowther, 7 H. C. Coleridge, Stroke A. B. Avers, Cox D. A. Robinson.

Light IV—Bow W. P. Garson (Steersman), 2 A. N. Crowther, 3 D. C. Parr, Stroke A. B. Avers.

Coxed IV—Bow M. Simmons, 2 M. Keighley, 3 J. K. Anderson, Stroke H. C. Coleridge, Cox D. A. Robinson.

Chiswick Regatta May 23rd.

We entered a Light IV and a Clinker VIII for this. The Light IV met Westminster Bank in the first round. We had a very rough row on the top of the tide; we never really managed to master the conditions and they beat us by two lengths. The Clinker VIII was what had been the 2nd VIII but there were several changes to the crew which performed in the Bumps. This eight lost in the first round to Thames Rowing Club, the eventual winners.

Crews

Light IV—as above.

Clinker VIII—Bow K. Gilsenan, 2 J. Tricker, 3 R. Clayton, 4 C. R. S. Anderson, 5 J. Wright, 6 J. Silverton, 7 J. K. Anderson, Stroke D. Macfarlane, Cox J. Tudor.

After Chiswick Regatta it became impossible to maintain a regular 2nd VIII so it was disbanded, but the Novice VIII was still rowing and a Junior Coxed IV was also formed. It is very unfortunate that in the summer, when rowing is more enjoyable than at any other time of the year, it becomes increasingly difficult owing to holidays, exams, etc., to keep crews together.

At this time the Light IV moved to Teddington where we had been kindly lent a rack by Walbrook Boat Club. The stretch of river above Teddington Lock is more suitable for IV rowing as it is not tidal and the coach is able to stay much closer to the crew than at Chiswick The Crew went out six times a week from then on and also circuit trained three times a week at lunch time. From May 25th to June 6th we were coached by Bill Howkins who concentrated mainly on the basic skill of rowing a four and tried to get us paddling together as a crew.

On May 30th the Light IV entered Twickenham Regatta and lost to Wallingford in the Senior IV's. The Novice VIII and the Junior IV entered Reading Clinker Regatta. The VIII were beaten by Kingston Grammar School and King's School Worcester "A". The IV lost to Thames Tradesmen.

On June 6th the Light IV raced at Walton where we lost in the first round to the winners,





This is the idea that started the plan of the Hormone house that Organon built.



This is the researcher who had the ideas that started the plan of the house that Organon built.



This is the rat that was there at the start, as well as the cows, the sows and rabbits that enabled the researchers to probe the secrets of the hormones which built the house of Organon.



These are the workers who mixed the chemicals that joined up the molecules to make the bricks of the house that Organon built.



This is the doctor who found that the hormones helped his patients and prescribed the products of the house that Organon built.



THE HORMONE HOUSE

Organon Laboratories Limited, Crown House, London Rd., Morden, Surrey

Sons of the Thames Rowing Club. On the same day the Junior IV were rowing for pleasure rather than glory at Horseferry and were beaten. After this Regatta both they and the Novice VIII broke up as exams were approaching but a hard core of four formed a Novice IV and continued rowing till the end of term.

Crews

Junior IV-Bow M. Simmons, 2 M. Hinds Howell, 3 G. D. Bell, Stroke D. Macfarlane Cox P. B. Hoole.

Novice IV-Bow J. G. D. Baker. 2 A. H. Roderick, 3 P. Cheetham, Stroke R. Franks, Cox J. Tudor.

At this time we decided in the Light IV that a change of steersman might save us a considerable distance in races as well as saving us from danger at other times, and A. N. Crowther took over the job. From June 6th Peter Brass took over the coaching of the Light IV. During the next fortnight we began to think more about rowing races and we did more rowing during practice. In retrospect it was a mistake to enter Regattas as early as we did, we would undoubtedly have done better to wait until our training had advanced further and we were more prepared for racing.

On June 13th we raced Thames Rowing Club (Runners-up at Walton) in the Senior Fours at Reading, and lost by three lengths. It was interesting to see that our time over the course was considerably faster than any of the Hospitals who were entered in Junior/Senior Events. Also the newly formed Novice IV had its first race at Isleworth Regatta where they were beaten, it was also their last as the term

was nearly over.

At Marlow on Friday, June 19th the Light IV raced against Lensbury Rowing Club. Lensbury took three-quarters of a length off us on the start but we then began to go back on them and continued to do so until at about halfway they had only one-quarter length lead. At this point the crews nearly collided, in freeing ourselves we went down again and after a "shipwreck" while rowing in their puddles we were one length down. We then began to gain on them once more and with a finishing burst, alas too late to reverse the result, we greatly reduced their lead, but they won by two feet.

After Marlow Regatta we paddled up to Henley and remained there, training over the course until the Regatta. We took up residence at the Greyhound in Wargrave, where, as before we were well looked after. At Henley we had two outings a day. It was unfortunate that

in the end we were unable to find one coach who could take us regularly throughout, but we were coached for almost every outing. C. N. Hudson coached us for most of the time driving from London on each occasion, Joe Bailey coached us three times and John Johnson and Peter Webb also helped.

We were very pleased to find that this year we were not included in the eliminating races, which allowed us more days of training before

the Regatta.

In the Regatta we were drawn against Imperial College in the 1st round of the Visitors IV's They beat us off the start and stayed ahead of us to win by 13 lengths in a relatively fast time. We certainly justified our exclusion from the eliminating races and we clocked a faster time than St. Thomas', the only other Hospital to reach the Regatta, but these are small consolations for losing a race which we should have won. The crew which raced at Henley was as follows:-

Bow W. P. Garson, 2 A. N. Crowther (Steersman), 3 D. C. Parr, Stroke A. B. Ayers,

Spare Man J. K. Anderson.

The crew remained together after Henley until Kingston Regatta on July 11th. There we raced against Westminster Bank again as we had done at Chiswick and again they beat us. After this the IV stopped rowing.

The following Friday, July 17th, W. P. Garson and A. B. Avers entered as a pair in Molesey Regatta. The result was a minor disaster; unfortunately the steering was not all it might have been and after only a short distance we struck the buoys on one side of the course. We got going again but before very long we hit the buoys again and this time left the course. The Umpires Launch considered passing us but resisted the temptation and we returned to the course to finish ahead of it. though behind our opponents, Thames Rowing Club.

For the last race of the season, at Staines on July 25th D. C. Parr, J. K. Anderson, W. P. Garson and A. B. Avers rowed in a Light IV against Thames Tradesman. They beat us and went on to reach the final. After this rowing stopped.

We would like to offer our congratulations to C. N. Hudson on his election to Leander Club, and at the same time thank him for all he has done for us. As usual this year he has spent a great deal of time and effort coaching us. Few can be more dedicated to

At the Annual General Meeting on June 12th the following were elected to the Committee for 1964-1965:



IT STANDS FOR security and peace of mind from the day you qualify-until the day you retire-and after. IT STANDS FOR the provision of advice on all your professional problems . . . for legal assistance in any difficulty or proceedings of a professional nature . . . for unlimited indemnity in respect of damages and costs in the event of an adverse verdict or a settlement out of Court.

IT STANDS FOR THE MEDICAL DEFENCE UNION the oldest and largest organisation of its kind in the world. Further particulars can be obtained from

THE MEDICAL DEFENCE UNION Tavistock House South, Tavistock Square, London, W.C.1

Secretary Dr. Philip H. Addison Dental Secretary B.D.S., F.D.S.

Captain: A. B. Ayers; Hon. Secretary: M. Keighley: Hon. Treasurer: D. C. Parr; Soc. Secretary: G. W. Libby; Clinical Rep.: A. N. Crowther; Preclinical Reps.: M. Simmons, P. Cheetham.

TENNIS CLUB

v. Culham College, Oxford Lost 4-5

This was one of our best fixtures this season. The match was closely played throughout and the deciding game went to three sets. M. Johnson played his best game of the season and was well supported by M. Fryer. Our first pair did not play so well which was a disappointment.

Team: P. Mitchenere, A. Edelsten, M. Fryer, S. Johnson, S. Kohli, C. Garrard.

HOSPITAL CUP Semi-final v. St. Georges Won 5-4

This was a close match for at tea the score was 3-3 with St. Georges in an advantageous position. After tea each side won one further game so that all depended on the final match which E. Carden and M. Fryer clinched in

straight sets 6-0, 6-4.

Final v. St. Mary's Lost 4-5 After last years introduction to Cup matches we planned this game carefully to take account of Mary's strong first pair who have represented London University. All went

according to plan until our third pair unfortunately lost their game and gave Mary's the match.

Team: P. Mitchenere, (Capt.), A. D. Edelsten, E. Carden, M. E. Fryer, S. C. Kohli, M. Nightingale. **U.H. Singles Competition**

M. E. Fiyer played very well to reach the final where he was beaten 6-3, 6-2 by A. Price of St. Mary's.

ST. BARTHOLOMEW'S HOSPITAL GOLFING SOCIETY.

The Thirtieth Summer Meeting was held at the Berkshire Golf Club on the 10th June, 1964. The results of the competitions were as follows:

The Gordon-Watson Cup

Winner: R. V. Fiddian-34 points. Runner-up: H. Bevan Jones and J. L. Fison -32 points.

The Gillies Trophy

Winner: H. Bevan Jones-29 points.

The Corbett Cup

Winner: D. L. Pedersen-31 points. Sealed Holes

Winners: H. Bevan Jones and I. Kelsey Fry -10 points.

The Twenty-ninth Autumn Meeting will be held at Swinley Forest Golf Club on October 8th, 1964, and it is hoped that as many Members as possible will turn out.

People who know best prefer ILFORD

The finest film/screen combination available in medical radiography

ILFORD GOLD SEAL X-RAY FILM

Extreme speed and superb quality make ILFORD Gold Seal X-ray film without equal for gastro-intestinal radiography and for pelvimetry and paediatric radiography. Apart from reduced radiation hazards and improved definition through shorter exposures, ILFORD Gold Seal is remarkable for high contrast and low fog level. ILFORD Gold Seal and ILFORD Fast Tungstate Screens are the finest film/screen combination available in medical radiography.

ILFORD LIMITED . ILFORD . ESSEX



CONTENTS

			4
			4
analge	sia by (
			4
			4
uestion	inaire		4
			4
			4
			4
			4
		Mrs.	
			4
			4
			4
			4
asticut	/11		4
,	Analges uestion nder? ne N.K	uestionnaire nder?	uestionnaire nder? ne N.K.S. by Mrs

PUBLICATIONS COMMITTEE

Chairman: Dr. A. W. FRANKLIN.

Deputy Chairman: Dr. G. H. FAIRLEY.

Editor: C. J. KELLY.

Review Sub-Editor: G. R. HAMILTON.

News Sub-Editor: M. A. P. S. DOWNHAM.

Social Sub-Editor: Miss J. BELL.

Photographic Sub-Editor: B. C. P. LEE.

Manager: J. R. SWAIN.

Asst. Man. (Subscriptions): A. R. BAILEY.

Asst. Man. (Advertising): R. L. COOPER.

Nurses' Representative: Miss M. IRONSIDE.

EDITORIAL

Artist: P. CULL

The National Health Service is not a very big issue in the coming General Election but it is disappointing to find that improvements in the health service are not more prominent in the manifestos of the three main political posties.

From the ordinary elector's point of view the main difference between the parties in the field of health is that the Liberals and Socialists advocate the abolition of prescription charges while the Tories do not favour such a step. Abolition of charges may be a vote catching idea but it would also seem to be bad economics. While the majority of the nation can so easily afford these charges their abolition would unnecessarily add to the N.H.S. bill. A more realistic proposition would be to abolish these charges for old age pensioners and those on National Assistance. The Liberals would pay for their proposal by buying drugs in bulk on a regional scale; this is not a bad idea but does not affect the main argument.

The Socialists, under the slogan "Labour will put the patient first," call for a completely free health service and reject out of hand recent proposals for direct payment to the G.P. by the patient. There are no proposals in the Labour manifesto for improving the lot of the G.P.; this seems a pity for on coming to office a Labour government would soon be faced with unrest among Britain's family doctors. The Liberals intend to en-

courage qualified doctors to practise by reforming methods of payment and introducing refresher courses. The Conservatives have a working party considering how best to help the family doctors and in particular are looking at their terms and conditions of service, the methods of payment, the number of patients on their lists and their access to hospitals. This scems to be the right line to take and it is sad to see the Socialists ignoring the present difficulties and merely taking a long term view; they propose to increase the number of medical schools and also increase the number of students admitted to existing medical schools. Unfortunately this will do nothing to halt the 25% of doctors who, on registering, emigrate.

The Liberals and Socialists are also concerned with the shortage of nurses. The Liberals would review the wage and career structure of nurses; they also want to make it easier for married nurses to work part time. This is an excellent approach and should be applied not only to nurses but to married female doctors. The Conservatives have nothing to offer the nurses. Increase in pay is the prime necessity

The Conservatives promise to build or rebuild 300 hospitals and carry out 400 major improvement schemes. The Socialists reject the Tories' plans and propose a revised hospital plan. Both parties give priority to maternity beds and yet neither party impresses on this subject.

On community care all parties promise increase in domiciliary services but the Liberals emerge with what seems a valuable suggestion. They propose setting up Area Health Boards to bring together the separate branches of the health and welfare services thus avoiding duplication; in this arrangement the G.P. will have a leading position and be allowed to recover "the scope and opportunities he often lacks today." Although no mention is made of it the G.P. will hope that these Area Health Boards would supply necessary ancillary services.

Both Conservative and Socialists propose improvements in the care of the mentally ill but the Socialists steal a march on the other two parties by promising to increase the resources for medical research. This is possibly their best proposal.

Whichever party wins on 15th October we earnestly hope for developments in the N.H.S. somehow, sometime.

Correspondence

WEITZMAN MEMORIAL PRIZE

Sir.—Following the tragic death of Dr. David Weitzman, it is proposed to institute a Memorial Prize in his name at St. Bartholomew's Hospital.

Dr. Weitzman was connected with the Hospital from his student days and it is felt that many of his friends and colleagues at the Hospital would wish to be associated with this project.

Those desirous of doing so are asked to send contributions to the address below, cheques to be made out to the "David Weitzman Memorial Fund".

Sincerely yours,

H. A. Isenberg

583 High Road, Tottenham, N.17.

14th August.

CAMBRIDGE GRADUATES CLUB

Sir,—Except in the wars, this club has held a dinner every year since 1876 "in order that those members of the University already at the Hospital might have an opportunity of making the acquaintance of the newcomers each year". Attending the dinner has become an annual habit of many old Bart's men from all over the country as well as those still in the Hospital.

This year the dinner will be held on Friday 30th October, at 7 for 7.30 at the Connaught Rooms, with Dr. Allan Spence (Caius) in the chair.

Will any Bart's Cambridge graduate who does not receive a notification please inform either of the secretaries.

Yours faithfully,

H. Jackson Burrows R. A. Shooter

Honorary Secretaries

WHITHER GENERAL PRACTICE?

Sir,—I write to congratulate you on your leading article, in the August Journal.

In spite of all the difficulties of General Practice today and the disincentives which have worn away the good will of conscientious family doctors over the past decade, it still

remains to the majority of us the most worthwhile and rewarding job that any man could wish to do.

One of the greatest problems—as your leader underlines—is finding ways and means of easing the work load on the General Practitioner.

This can be done by efficient organisation—which includes the provision and maintenance of properly equipped premises and the employment of trained medical ancillary staffs (e.g., Health visitors, midwives, nurses, secretaries and receptionists).

Unfortunately the National Health Service is so geared at present that the doctor who chooses to provide such amenities (not only for his own convenience but also for the better treatment of his patients) finds himself burdened by capital outlay and such extensive inroads into his own personal income that he can no longer tolerate his position within the service. It is small wonder, therefore, that others-and especially the younger doctorsare reluctant to improve their premises or their practice organisation when they know that in so doing they will be subsidising the health service at their own expense; in consequence they find themselves continuing to work in unsuitable and inadequately equipped and staffed premises. Thus these doctors too, through sheer frustration, are finding their situation untenable. For those reasons alone how could any branch of the service expect to attract new recruits?

Steps designed to relieve the work load must also include those calculated to remove much of the trivia with which the G.P.'s daily work is bedevilled. This is not easy. Efficient practice organisation can eliminate a great deal of his office and clerical work and can sieve off some of the unnecessary calls on his time; a reduction in the certification he is at present called upon to do would also help, as would propaganda by television, radio and the national and local press—particularly if the emphasis is on the promotion of health and not on sickness-consciousness.

But in my opinion no complete answer will ever be found to this problem. The G.P. is the doctor of "first instance". There is no screen between him and the patient who is mentally incapable of judging the degree of severity of his symptoms or of taking upon himself any responsibility for his own or his family's problems—in matters of health or of anything else; nor can the doctor ever be relieved of the

pathological nuisance maker (any more than can the butcher, baker or the candlestick maker). If, for example, a 'phone call asks for a visit to a patient who feels faint the G.P. knows that in nine cases out of ten this call will prove to be unnecessary. But on the tenth occasion he may be dealing with a major crisis-and he cannot make this judgement down the telephone. Nor, let it be said, can he risk failing to visit, because if he is indeed dealing with number ten his visit may make just that difference between life and death and -if this alone were not enough his failure to visit might result in his being hauled up before a disciplinary committee and punished. What legislation could possibly be devised to make this decision for him?

It has been suggested that doctors should be given the right to make a complaint against a patient and that after a certain number of complaints have been received against the same patient the facilities of the Health service should be withdrawn from him for a given time. This has political repercussions and I cannot see our present lay politicians ever agreeing to such punitive measures being taken against their constituents — it could hardly be described as a vote catching device.

Nevertheless, relieving the work load is vital—so that the doctor has time to read, to undertake postgraduate work and research, to enjoy some free time with his family and, above all, to have adequate time to treat his sick patients as he knows they should be treated—and inherent in this latter is that patients should be treated in their homes and only transferred to hospital care for social reasons or because more full and complicated investigations and treatment have become necessary.

If the whole treatment of the whole patient is to be undertaken in the home (which is our ideal) then X-ray and laboratory facilities must be made available to all G.P.'s (and not just to some), and domiciliary consultations by hospital colleagues be extended so that they can take place in the surgery as well as the patient's home; G.P.'s should be given the opportunity of taking some responsibility for the care of their patients in hospital by the provision of G.P. beds and - perhaps most important of all-we must work for the complete integration of the three main branches of the profession (so disastrously divided by the N.H.S. Act). Already some regions are building post-graduate medical centres which include common rooms, libraries and lecture theatres open to all doctors in the area. We can only applaud this move and urge for an extension of these centres throughout the whole country.

Finally, one must stress the absolute need for the inclusion in our medical education of adequate time in the undergraduate and post-graduate periods for students and doctors to be given the opportunity to see, work and be ducated in general practice. This should not be left to voluntary effort on the part of the more conscientious students and well-meaning G.P.'s or to certain areas (such as Wessex) and voluntary Trust funds. It should be compulsory and national.

Yours etc.,

20th August.

Ronald Gibson, Winchester.

TREATMENT OF STUDENTS' WIVES

Sir,—Your Editorial in the September number intrigued me for it reminded me that when I was a Senior Registrar my wife was delivered in Bart's by a Student, of a baby with the cord round its neck. Had he not been there and dealt efficiently with the situation the baby would surely have died.

This, however, is of course quite irrelevant to your theme. She was in hospital in order that the baby should be born alive anyway, and it was, quite rightly, the student that delivered her because of the dire shortage of beds for obstetric teaching. We should not therefore be blinded by arguments based on such events.

You state that students and their wives should never be examined by students. With this I heartily disagree for many circumstances exist when such a categorical prohibition should be lifted. But if you would alter it and suggest that students and their wives should not normally be examined by students; that consultants should feel honoured enough to make special provision to see them personally and privately; that appointments should be as punctual as possible; and that the teaching of courtesy by precept is one of the really important parts of the curriculum you would certainly have my vote.

Yours faithfully,

H. Wykeham Balm, 15 Connaught Avenue, Longcroft, Loughton, Essex.

3rd September.

Sir,—Your Editorial in the issue of the 1st September is justifiable and humane; but it should be read in conjunction with Dr. Wykeham Balme's quotation of Mr. Seymour Philps about the need for kindness in doctors. (Page 377 of the same issue).

Most of us do our best to keep as near to our appointment times as possible, but all the extra demands on time of telephone calls and discussions cannot be catered for in advance or left until the end of the clinic. Most of us also find that we need to put in patients who are referred back urgently or who ask to be seen earlier than their current appointment. To keep to one's appointment times one has either to refuse to see these patients or burden somebody else with them; and in any case whoever accepts the additional burden will naturally not be able to keep to his schedule. This seems to be an insoluble problem for the doctor who wishes not to turn people away, and I doubt whether anyone would want us to leave gaps of a half-an-hour here and there in the middle of a clinic just in case the time might be needed for an extra patient.

Yours faithfully, Louis Rose,

10th September.

45 Wimpole St., W.1.

WOMEN'S GUILD

Sir,—We would like to draw your Readers' attention to our Boutique, advertised in this issue.

During the last year the Guild has greatly increased its services and grants to the Hospital and Nursing Staff, and money is now urgently needed to meet these additional commitments.

The first of our money raising projects is this Boutique which will take the form of an informal sale of new and slightly worn clothing, hats, jewelry, cosmetics, etc., all at bargain prices. Our target is £300 but we can only reach this if we have adequate support. We would therefore be most grateful for gifts of any of these items and parcels should be sent addressed to me, c/o The Steward's Office, St. Bartholomew's Hospital, during the two weeks preceding the sale—lst to 11th November. In some cases collection may be arranged by telephone.

Yours faithfully, Marjorie M. Oswald, Chairman, Executive Committee.

5th September.

Calendar

OCTOBER

Sat. & Sun., 3rd & 4th.

Dr. E. R. Cullinan Mr. Naunton Morgan Mr. Burrows

Dr. Ian Jackson Mr. Cope

Sat. & Sun., 10th & 11th.

Dr. G. Hayward Mr. Badenoch Mr. Manning Dr. T. B. Boulton Mr. McNab Jones

Sat. & Sun., 17th & 18th.

Dr. A. W. Spence Mr. Tuckwell Mr. Aston Mr. F. T. Evans Mr. Hogg

Sat. & Sun., 24th & 25th.

Prof. Scowen Prof. Taylor Mr. Burrows Dr. R. A. Fuller

Sat. & Sun., 31st & Nov. 1st

Dr. Bodley Scott Mr. Hunt Mr. Manning Mr. G. Ellis Mr. Cope

Physician Accoucheur on Duty for the month of October is Mr. Fraser.

Engagemen

GLOVER ROYLE.—The engagement is announced between David Glover and Gay Royle.

Marriage

Hamilton—Yates-Bell.—On August 29, Ian Hamilton to Caroline Yates-Bell.

Birth

KENNEDY.—On August 18, to Jill and Dr. Robert Kennedy, a son (Alexander Thomas), a brother for James, Fiona and Felicity.

Deaths

DAVID.—On July 21, Dr. John Ernest Awelrydd David, M.B., B.Chir., M.R.C.P., Ed., M.R.C.P. Glasg., D.C.H., aged 54. Qualified 1936.

Howell, —On August 7, Dr. Handley Brooke Howell, M.R.C.S., L.R.C.P., D.M.R.D. Eng., Qualified 1925.

LLEWELLYN.—On August 28, Dr. Evan Edwards Llewellyn, M.D., aged 71. Oualified 1917.

Naish.—On August 2, Dr. Albert Ernest Naish, M.A., M.D., F.R.C.P., aged 92. Qualified 1896. Changes of Address

Dr. E. Savage. to 5, Heol Don Court, Whitchurch, Glamorgan.

DR. L. G. R. WARD, to The Homestead, 19, Gidea Close Gidea Park, Essex.

Appointments

Royal College of Physicians.

Dr. Elliott A. Shinebourne has been awarded the Murchison Scholarship.

Prof. E. F. Scowen has been appointed Lumleian lecturer and Dr. G. Simon Marc Daniels lecturer for 1966.

We gratefully acknowledge receipt of the

following contemporary publications:

Black Bag, Boston Medical Quarterly, British
Rheumatism Review, Broad Way, Bulletin of the
Medical Society of the County of Kings and Academy of Medicine of Brooklyn, Bulletin of the Maryland Medical School, Bulletin of the University of Miami Medical School, Bulletin of Osuku Medical School, Bulletin of the Tokyo Medical and Dental University, Charing Cross Hospital Gazette, Chicago Medical School Quarterly, Elixir, Epsomian, Future Pharmacist, Guy's Hospital Gazette, Health Services Journal, Heart, Innominate, Japanese Journal of Medicine, Journal of the Faculty of Medicine, Baghdad, Journal of the Indian Medical Profession, Journal of the Medical Women's Federation, Journal of the Oslo City Hospital, London Hospital Gazette, Manchester Medical Gazette, Medical Digest, Murmur, Newcastle Medical Gazette, News and Notes from the New York Medical College, Oxford Medical School Gazette, Physiotherapy, Queen's Medical Review, Royal Dental Hospital Magazine, Royal Army Medical Corps Journal, Royal Free Hospital Journal, St. George's Hospital Gazette, St. Mary's Hospital Gazette, St. Thomas's Hospital Gazette, Snakes Alive, Stethoscope, Sphincter, Tokushima and Tohuku Journals of Experimental Medicine, Zodiac and University College Hospital Magazine.

> ST. LUKE'S TIDE SERVICE Church of St. Bartholomew-the-Great

5.30 p.m. Wednesday, 14th October, 1964. Sermon: The Right Reverend Kenneth Riches, M.A., D.D., Lord Bishop of Lincoln. The Rt Hon. The Lord Mayor, Alderman James Harman, G.B.E. and Sheriffs will attend.

The Treasurer and Governors hope that many may be able to attend this Service and cordially invite them after the Service, to sherry in the Great Hall of the Hospital. Seating in Church by 5.20 p.m.

WESSEX RAHERE CLUB

The autumn dinner of the above club will take place at The Hawthorns Hotel, Clifton, Bristol on Saturday, October 31st. Membership of the club is open to Bart's graduate practicing in the West Country and further details may be obtained from the Hon. Secretary, Mr. A. Daunt Bateman, 11 The Circus, Bath.

The Journal has arranged an exhibition of modern stethoscopes in the library gallery. Prices and names of firms supplying the models are provided, and the display also covers some historical aspects of auscultation. It will be on view for the first two weeks of October.

There is no doubt that the most important factor in auscultation is experience. Consultants, despite the use of often prehistoric stethoscopes and allegations that hearing-deficiencies develop with age, can always hear more than students. But this is no reason to ignore the considerable recent improvements in stethoscope design, and this review may be of use to those who are about to buy their first stethoscope, and to those who feel that their experience in auscultation is not too far developed to merit a change to a more scientific instrument.

The most important criteria for selecting a new stethoscope are acoustic efficiency, durability, portability, and price. Of these, durability and portability are not difficult to assess even for the inexperienced, and price is a matter of individual means. But the factors which make for acoustic efficiency are not widely appreciated, and indeed it is only comparatively recently that the physics of auscultation have been fully worked out. It is therefore worth running through the main things to look for when buying a new stethoscope. These can be summarised under four headings:

1. Chest-piece design. It is now widely accepted that no single bell or diaphragm is as good as a combination of the two. The reason for this is that auscultatory sounds are spread over quite a wide frequency range. High-pitched sounds like the early diastolic murmur of aortic incompetence are best heard with a tightly stretched diaphragm, while the low-pitched mid-diastolic murmur of mitral stenosis can often be heard only with a bell, which works by using the relatively lax skin of the patient as its diaphragm. Once this principle is understood it is obvious that the optimal frequency for the bell, and to a lesser extent the diaphragm, can be varied by changing the pressure with which the chestpiece is applied to the skin. A simple demonstration is the way in which the murmur of

A REVIEW OF STETHOSCOPES

mitral stenosis can become inaudible if more than very light contact is made with the bell.

It is also important to look at the design of the bell itself. The larger its diameter, the greater will be the conducted sound; but if it is too large it will be difficult to fit it into the depressed intercostal spaces of older patients, and there will be a reduction in accuracy of localisation of abnormal sounds, especially in children. The happiest compromise is a diameter of about 2 cms.

2. Dead space. Only recently has it been realised that the greater the volume of air between the diaphragm or the patient's skin and the ears of the listener, the greater will be the loss of sound energy during conduction. This has several bearings on the design of the instrument, the most obvious of which is that the tubing should be as short as possible. We are still suffering from the Victorian idea that the doctor, in order to avoid contagion, should be at the furthest possible distance from his patient during aucultation; at one time the length of the tubing was said to have been determined by the height that a flea could jump. The tubing should also bifurcate as near to the ears as possible: this will not only reduce the air volume, but also minimise the danger of extraneous noise being produced by the two limbs rubbing across each other. The best internal diameter for the tubing is \(\frac{1}{2}''\)—anything smaller loses more through a frictional effect than it gains by reducing the air volume. Finally the spaces in the bell and behind the diaphragm should be as shallow as possible.

3. A close and comfortable fit into the ears. This is mainly a matter of individual experiment, and it is essential to try on any stethoscope before buying it. As well as the right size in ear-pieces and a firm spring to keep them in place, it is important that the weight of the instrument is not such that it drags on the ears and so opens up small but fatal leaks in the system.

Continued on page 413

* THE PROBLEMS IN OBSTETRIC ANÆSTHESIA

By C. J. White

Anæsthesia for any surgical operation must provide absence of pain for the patient, good surgical conditions such as muscular relaxation to assist the surgeon in his task, and above all safety. These conditions must also be provided when obstetric anæsthesia is required and at first sight it might be thought that the problems are less than those which arise in the conduct of the anæsthetic of other surgical patients.

The chief concern of the anæsthetist in this branch of anæsthetics is one of safety; safety for the mother and safety for the child. Safety perhaps, is a very obvious consideration, but in obstetric anæsthesia there is a particular hazard and this arises from the fact that the mother's stomach often contains food or gastric fluid when an anæsthetic is needed.

The well-being of the foctus is clearly linked with that of the mother and while in utero is entirely dependent upon her. When delivery has taken place the infant may show the effects of anæsthetics and drugs received across the placenta or of the physiological insults to which it has been subjected. The result may be one of mild resentment or of severe depression of the vital centres.

The anæsthetist, of course, has no intention of anæsthetising the foetus and this is just an unfortunate happening.

The Problem of the Mother

The danger of anæsthesia for the mother is outlined in the Ministry of Health Reports¹ into Maternal Deaths, which cover the years of 1952 to 1960. These reports give an average yearly total of 12 deaths due to the complications of anæsthesia. Further analysis of the years 1958, 1959 and 1960 gives a total of 30 deaths resulting from obstetric anæsthesia, and inhalation of stomach contents occurred in 17 of these cases.

The reason for the high incidence of inhalation of gastric contents during obstetric anæsthesia appears to be due to the presence of a temporary hiatus hernia in many patients in late pregnancy. Such patients often complain of the symtoms of oesophageal reflux especially

when lying flat or bending down. This incompetence of sphincteric mechanism of the gastro-oesophageal junction may make anæsthesia hazardous in late pregnancy before labour actually commences. The stomach may be dilated and contain large amounts of acid gastric fluid. This is often the case during long labours associated with uterine inertia. A patient may also have taken a meal just before the need for operative intervention becomes apparent. Such might be the case if a patient developed a severe ante-partum haemorrhage with a probable diagnosis of placenta praevia. During labour the patient usually takes meals of a light or liquid nature. A labouring patient seldom desires solid food, but starvation is undesirable and does not guarantee that the stomach will be empty. If the patient is restricted to a fluid diet, the aspiration of the stomach contents by a stomach tube, before anæsthesia, will be more effective.

During anæsthesia gastric contents may enter the oesophagus and imperil the airway as a result of active vomiting or of passive regurgitation. Vomiting may occur during the induction of an anæsthetic or as the patient is emerging from the anæsthetic after the delivery is completed. Vomiting may also occur with an anæsthetic agent such as ether especially if the induction is a "stormy" one; such vomiting is encouraged by the early insertion of artificial airways. Vomiting is usually heralded by swallowing movements and by hesitation in respiration, and the experienced anæsthetist may be able to steer the course of the anæsthetic through this difficult stage.

Regurgitation is a passive reflux of stomach contents along the oesophagus as a result of incompetence of sphincteric mechanism at the gastro-oesophageal junction. This reflux is encouraged by a raised pressure within the stomach and by any downward inclination of the oesophagus. Excessive negative pressures within the thorax are transmitted to the oesophagus and further encourage regurgitation. This state of affairs may be present during vigorous inspiratory attempts occurring in partial or complete respiratory obstruction. Fluid escaping from the stomach may travel along the oesophagus and if the crico-pharyngeus is relaxed may enter the pharynx and possibly the glottis and trachea. This relaxation of the

^{*}Based upon a paper read at the Monthly Anæsthetic Meeting. St. Bartholomew's Hospital.

crico-pharyngeus may result from anæsthetics or the specific muscle relaxants.

Regurgitation or vomiting may allow gastric contents to enter the trachea. If this is the result of vomiting, the patient will probably be in a light stage of anæsthesia and coughing and further lightening of the anæsthetic will offer some protection.

The presence of gastric contents in the trachea may cause true asphyxia, which is comparatively rare, or may produce collapse of a lobe of the lung or aspiration pneumonia. A very dangerous and relatively more frequent happening, however, is the production of the picture described by Mendelson2. syndrome consists of bronchospasm, cyanosis, tachycardia and hypotension and may go on to pulmonary oedema and cardiac failure. The inhalation of a few c.cs. of gastric juice may produce this syndrome and the cause seems to be the acid content. The gastric juice of mothers who have been long in labour seems to be very potent in causing this catastrophe. Should inhalation of gastric juice take place, it is imperative to clear the pharynx by suction under direct vision and to intubate the trachea with a cuffed endotracheal tube. The trachea and bronchi are then sucked out with catheters. allowing the patient to breath oxygen between each attempt at suction. Suction following the instillation of small amounts of normal saline into the endotracheal tube has been recommended, in an attempt to dilute the acid and aid its removal. If Mendelson's syndrome develops, it may be necessary to give digoxin and aminophylline. The administration of hydrocortisone has been advised since there may be a relative deficiency of cortisone in certain of these patients. If there is gross contamination of the trachea and bronchi by food particles, bronchoscopic suction may be necessary, but this is not usually the case.

Attempts have been made by many anæsthetists to reduce this hazard before the induction of the anæsthetic begins. Tubes of various calibres have been employed to remove the stomach contents. A large tube is unpleasant for the patient to swallow and a small tube may be inadequate and is easily blocked by food particles. Tubes, the walls of which collapse during suction, are completely useless. If tubes are used in an attempt to remove the stomach contents, it must be remembered that this is seldom completely successful. The passing of the tube and the aspiration of the stomach contents should be performed by the anæsthetist and preferably just before the anæsthetic is required. The tube should be removed before the anæsthetic starts, as its presence may prevent mucosal apposition at the gastro-oesophageal junction, and encourages regurgitation of any residual gastric juice.

Injections of apomorphine have also been used before anæsthesia to induce vomiting and so empty the stomach, but the use of this method is unpleasant for all concerned.

It is possible that the time required to empty the stomach by these methods and the disturbance which ensues upon this may tip the balance unfavourably against a foetus which has already shown signs of distress, and in the case of prolapse cord, may result in the delivery of a dead infant.

The routine use, during labour, of antacid mixtures, has been advocated in an attempt to neutralise the stomach contents.

The design of the delivery bed is of great concern to the anæsthetist. Many beds in use in this country are still incapable of being rapidly tipped into the foot down or head down position. It is equally important that the controls which effect this movement should be placed close to the anæsthetist's hand. Beds have been described by Gibberd³ and Wylie⁴ and there are other patterns available. It is important that the controls are simple and that some essential part, such as a handle, cannot be removed. When a patient is in the lithotomy position, it is imperative that the head down inclination of the table can be immediately achieved in the event of vomiting.

Powerful suction apparatus must be available at the anæsthetist's side during the anæsthetic. This machine must be tested for correct assembly and function before anæsthesia starts. The proper working of suckers is often impaired by chipped rims of the glass containers, misplaced rubber gaskets, or by the tops of the jars being too loosely applied. The suction tubing must be suitable. If it is too old or too thin-walled it will collapse and be useless.

The Problem of the Infant

Now let us consider the infant, firstly before delivery takes place. It is obviously important that maternal hypoxia should not be allowed to occur, as low oxygen tensions in the maternal blood are followed by low oxygen tensions in the foetal blood. Foetal hypoxia may also occur if uterine blood flow is reduced. Agents which reduce maternal blood pressure may cause this and drugs which increase uterine tone may also reduce uterine circulation. The infant's respiratory centre will be affected by morphine or pethidine given to the mother within three or four hours of delivery; nalorphine or levallorphan are sometimes given to the mother just before delivery to counteract the depressing effects on the infant's respiratory centre of analgesics given to the mother. The muscle relaxant, gallamine, crosses the placenta

readily but curare and suxamethonium probably do not, in appreciable amounts. Suxamethonium possesses the advantage that should any placental transmission take place, the neonate is relatively insensitive to its effects. The anæsthetic gases and vapours cross the placental barrier readily and may produce respiratory depression. It is one disadvantage of the traditional inhalation anæsthetic techniques using a face mask that in order to obviate the risk of vomiting, the anæsthesia tends to be kept rather deeper than is altogether necessary, with the result that there may be some foetal depression. If relaxants and controlled respiration are used it is desirable that the maternal partial pressure of carbon dioxide should not be allowed to depart too far from the normal, or there may be delay in the start of the delivered infant's respiration.

Provision must be made for resuscitation of babies whose respiration is inadequate. Often the airway is obstructed by mucus or amniotic fluid. If the use of a suction catheter is not effective, then the larynx must be seen, using an infant laryngoscope, and the airway care-

fully cleared.

If respiration is still inadequate or absent, the trachea may be intubated with a neonatal endotracheal tube and the lungs gently inflated with oxygen. To facilitate this, the baby is placed immediately after delivery on a padded tray which can be tipped into the head down position and which is placed at a reasonable height from the floor to enable the anæsthetist to use a laryngoscope. The oxygen supply which is used should have a device such as an underwater 'blow off' tube which limits the oxygen pressure to, say, 20 cms. of water. Excessive pressures have been known to cause rupture of the infant lung. Gastric⁵ administration of oxygen has been shown to be a valueless procedure, although the stimulation caused by the passing of the small tubes into the stomach may initiate respiration.

Good oxygenation of the infant hastens the changes that take place in the circulation after birth. The ductus arteriosus contracts under the influence of good oxygenation. Although the neonate is less liable to cerebral injury from hypoxia than is a child of a few months of age, there is a definite cerebral morbidity which can be ascribed to hypoxia at birth.

Method of Anæsthesia

It might seem that some form of conduction anæsthesia would be the logical answer to the problem of the full stomach and would also provide a pain-free delivery for the mother, while causing no ill effect to the child One form of such anæsthesia, pudendal block, is widely used for the easier forceps delivery.

Caudal block may also be used in this situation, but as with epidural and spinal block, requires scrupulous aseptic techniques. A continuous caudal block using an indwelling plastic catheter can be used to provide a painless labour and delivery. Lumbar epidural anæsthesia may be used for Caesarian sections, but the disadvantages lie in the time taken to produce analgesia, the difficulty in performing the epidural puncture in a patient in labour, and the fall in blood pressure which follows. Vasopressors are often needed to combat the hypotension which follows an epidural anæsthesia. Bromage6 has emphasised that the woman in late pregnancy requires a smaller volume of analgesic in the epidural space to produce the same level of analgesia as in a normal patient of the same height and age. Some patients are not emotionally suited to these analgesic methods and it must be agreed that many surgeons prefer

their patients to be asleep.

The traditional inhalation methods of anæsthesia have many adherents. One such method consists of the administration of nitrous oxide, oxygen and ether with or without trichlorocthylene as an introductory agent. Carbon dioxide is often used in the early stages to encourage the introduction of ether. The patient may be induced in the lateral position, or with one pillow under a shoulder and the face turned to the opposite side. Some head down tilt can also be adopted. A transparent face mask may be used, but a face mask should never be strapped in position. When the anæsthetic is judged to be in the light planes of surgical anæsthesia, the operation can begin. If the operator can be persuaded to perform a vaginal delivery while the patient remains in the lateral position, then the anæsthetic is made safer. Usually at this stage, however, the patient is turned on to her back and put into the litho-

Ethyl chloride followed by ether on an open gauze mask, or divinyl ether followed by ether have been used by many anæsthetists, but the induction is not a pleasant one. Chloroform has its adherents still and is favoured by many of the older G.Ps. This agent, however, has been responsible for a number of the anæs-

thetic deaths in obstetrics.

These purely inhalational methods of anæsthesia rely upon a rapid smooth progression of anæsthesia from consciousness to a stage at which active vomiting will not occur. Vomiting cannot occur unless heralded by a pause in respiration and any hesitancy in respiration or any signs of swallowing movements are watched for with care. Those who use this method gain some comfort in the belief that the cough reflex disappears later than the vomiting reflex as anæsthesia deepens.

The Cuffed Endotracheal Tube

Today, with the risk of the inhalation of stomach contents very much in mind, many anæsthetists seek to introduce a cuffed endotracheal tube into the trachea at the earliest possible moment, as advocated by Wylie⁷. This method has found favour in cases of acute intestinal obstruction, which condition many patients in labour resemble. One method consists of the administration of a 50 per cent mixture of cyclopropane and oxygen with the patient in a steep foot down position, followed by an intravenous injection of suxamethonium and rapid intubation of the trachea when relaxation takes place. Many other anæsthetists follow the Portsmouth school and give Thiopentone, 200-250 mg., followed by suxamethonium, again in the foot down position. This foot down position discourages the reflux of gastric contents in the trachea. since the pressure of the stomach contents is probably less than the vertical distance of the glottis above the cardia. When this method is adopted, the patient is usually given oxygen to breathe for two minutes before induction. and a Mitchel or Gordh needle is inserted into a vein during this time.

Some workers consider that the pressure within the stomach may be increased when suxamethonium is given and Sellick⁸ has recommended digital pressure over the cricoid to prevent any reflux past this region.

Following induction and the passage of the cuffed endotracheal tube, the table is levelled and the anæsthetic is continued, using Nitrous Oxide and oxygen, controlled respiration, and curare or intermittent suxamethonium. After delivery, pethidine or morphine may be given intravenously.

Criticism has been levelled at the use of nitrous oxide, oxygen and relaxants in these cases, because patients have on occasions been aware of the surgical procedure, although usually quite pain-free. It is certainly true that in a patient who has received no sedative premedication, as in obstetric practice, the anæsthesia may be very light, but most of the cases reported occurred when a 50 per cent mixture of nitrous oxide and oxygen was used. Hyperventilation cannot be used to increase the depth of anæsthesia, since the foetal pC02 might be reduced below the normal, but there is no reason why at least six or seven litres of nitrous oxide should not be used with two litres of oxygen, perhaps increasing the oxygen percentage just before delivery.

These techniques which depend upon rapid

intubation of the trachea require an experienced anæsthetist who has had practice in intubating patients under difficult conditions. It is only through such practice that the anæsthetist will be able to tackle the problem with confidence and speed.

Whatever method of anæsthesia is used, the anæsthetist must tactfully enquire that all is ready before he starts. The orderly arrangement of his syringes and instruments will be to his and his patient's advantage in this as in other anæsthetics where speed is important. When thiopentone is used, it is probably an advantage if delivery does not take place for five or so minutes after injection. This drug is probably best avoided altogether if a patient has received thiopentone a few hours before. This is sometimes the case if foetal distress or some other obstetric complication follows shortly after artificial rupture of the membranes performed under general anæsthetic.

It was suggested by workers at Portsmouth that infusions of pituitary extracts might cause suxamethonium apnoea due to changes in potassium distribution. This view has been refuted by other anæsthetists. Nevertheless, prolonged apnoea following upon suxamethonium used in obstetric anæsthesia does appear to be relatively more common. Cyclopropane should probably be avoided if a drip containing pituitary extracts has been given, as cardiac arrhythmias may be produced. The use of intravenous ergometrine may produce cardiac failure in diseased hearts by increasing venous return as the uterus contracts. A sharp rise in blood pressure may follow on the use of ergometrine.

Anæthesia for Special Obstetric Situations Assisted Breech Delivery and Breech Extraction

Anæsthetists are sometimes asked to induce anæsthesia during delivery of the head in an assisted breech delivery. The patient is already in the lithotomy position and anæsthesia must be rapidly produced. Cyclopropane and oxygen are often best suited to this situation, and the dangers from regurgitation, since the uterus is already largely emptied, are reduced. When anæsthesia is required for breech extraction, induction may be performed as for other obstetric operations and ether added to relax the uterus.

The Flying Squad

The obstetric flying squad has an important part to play in the maternity services. In country districts a considerable distance may be covered in attending a case in the home.

An anæsthetist has an essential place in the team and has to choose techniques which are suited to the domestic environment. The apparatus used must be readily transportable and must include an oxygen cylinder. It is a great advantage if an anæsthetic is given from apparatus which can be used without nitrous oxide and oxygen in order that these gases may be conserved. The writer has used the E.M.O. ether inhaler on numerous occasions with the flying squad and found it very satisfactory. This apparatus produces an accurate ether concentration and needs air and ether only. In the particular apparatus used, nitrous oxide and oxygen were given for induction, together with a little trichloroethylene vapour. After induction, the nitrous oxide and oxygen were turned off and air and ether vapour alone sufficed. Inflating bellows provided with the vapouriser enabled the lungs to be inflated if required.

À laryngoscope, tubes and drugs must be carried to the bedside; simplicity of technique is desirable. The sucker carried by the flying squad should be a foot operated type. These are powerful and independent of electricity supplies.

The commonest emergency met with is that of retained placenta, and transfusion may be necessary before anæsthesia can be started. Fortunately the risks of regurgitation are less in the third stage of labour but the induction should take place in the lateral position. The use of ether enables manual removal of the placenta to be easily performed. If ether or other flammable agents are used, sources of ignition should be eliminated. Where ether is vapourised by air alone the risk of explosion is avoided, although the vapours may still be flammable.

Summary

This article has endeavoured to present some of the problems which concern the anæsthetist in the obstetric field and has offered some of the practical solutions.

REFERENCES

- Reports on Confidential Enquiries into Maternal Deaths in England and Wales. 1952-1960. HMSO
- 2. MENDELSON, C. L. (1946): Amer. J. Obstet. Gynæ., 52, 191.
- 3. GIBBERD, G. F. (1955): Lancet, 1, 901 (April 30).
 4. WYLIE, W. D. (1956): Lancet, 1, 840.
 5. COOPER, E. A., HYLTON SMITH, PASK, E. A. (1960):
- 5. COOPER, E. A., HYLTON SMITH, PASK, E. A. (1960):

 Anasthesia, 15, 211.
- BROMAGE, P. R. (1962): Brit. J. Anæsth., 34, 161.
 WYLIE, W. D. (1955): Proc. Roy. Soc. Med., 48, 1089 (December).
- 8. SELLICK, B. A. (1961): Lancet, 2, 404.

A Review of Stethoscopes—continued from page 408.

4. Materials. The most important advance in this respect is the replacement of thick rubber tubing which absorbs sound, by plastics which can be given a glossy finish internally. Furthermore plastic is rather more rigid and gets closer to the ideal conditions of a completely straight conducting system.

The most popular stethoscope in this hospital has for some time been the Sprague-Bowles model. This fits rather few of the specifications discussed above. In particular the tubing is of rather too wide a bore, and the flexible parts are of rubber, not plastic, with a low bifurcation. It is however perfectly adequate, and of the stethoscopes available at similar prices it is in the reviewer's experience the best. Two other designs at about the same price—the 'E 9' and the 'Double E 9'—have several extra disadvantages, while their only improvement is a reduction in the bore of the metal tubing.

The next step up in the price range is the 'Leatham'. This is an undoubted improvement, with all the tubing of the right bore, more comfortable ear-plugs, and a considerable reduction in weight. It also has a cunning adjustable double bell which overcomes the dilemma about bell diameter mentioned above.

If you are prepared to pay a bit more there are two American designs, the 'Littmann'

and the 'Allen type V', which are probably the best stethoscopes available. Every detail that can add to acoustic efficiency has been attended to, and the result, especially with the 'Littmann', which has a built-in spring, is a strikingly simple, light and durable instrument. There is little difference between the 'Littmann' and the 'Allen', and as yet no evidence that the latter is worth its rather larger price.

There are just two more models worth mentioning. The first is the triple-chest-piece 'Tycos'. This clumsy enormity can be recommended only to the ostentatious. It is expensive, would need a caddy for transportation, and has listed as one of its major advantages a chromium clip specially provided for engraving your initials on. At the other end of the scale, and for those who feel that even a Sprague-Bowles is too extravagant an aid to inspection and palpation, there is the 'Yale' made by Becton and Dickinson; this is a simple and surprisingly efficient singleended stethoscope, with easily detachable bell and diaphragm. The moulded latex tubing is rather long, but you can always cut a bit off-unless you're still afraid of the fleas.

REFERENCES

LEATHAM, Lancet, March 1958. DAWSON, Practitioner, September 1964. THE floure of poets, that well so undefiled Now spekes again a tale for alle to read, One August even, a festive daunce and gay Now hold your pees and hearken what I say ... Bright was the sonne and clere that more more more.

A goodlye tent across the swarde bestrode Linked by an awning to the entrance doore, Right feechyngely bedekt with radivore. The Wyn Commyttee full indebtyd was To Mr. Spalding esquyr, an helpful man And T. O'Sullivan from Ireland's shore Who ably aided alle construction werke. From early dawn, the stout Antipodes Sittyng by the fuyr ful greet and reed, The divers mounds composed of woode and

Had kyndled and the fuyres assailed Upward to roast the noble Bore impaled Uponne the turnyng spit—a splendyd sight.



Swingyng Swaynes.



Gletule Carvers.

Thorwghout the day, they werked the ordinaunce.

The place becaym transformed with lightes and floures.

The leefs upon the tres alle bloo and grene And eek white Claude a jolye globe displayed As bright a follye as a Latin king has made. The revelours, fine felawes and their ladyes

Anoon they came and maketh fest and cheere. Besyde the Bore, a bar in gyse of dray Freed from its mighty steeds sikerly lay, And flowing beere made overgreete the witte, While many eet a ful and varied meal. Fine melon slyced and served with sneesy spice

Precede a divers sprede in which we found no lak

Breddy forms farced mysteriously to taste.

St. B.H.J., October, 1964.

The hogge ate well and barmed carvers

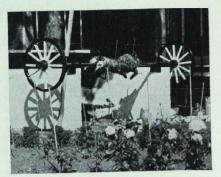
And lent a fillip to the hoote fare.
Betimes the companye the viands partoke
And many jugges of ale and botels dronke.
And they hadd alle ynough for it was chepe
But no one swownnyng by the beere lay.
The later Squires and housbondes fought

right hard
For places atte board for their ladyes,
And certes the lacke of knives and forkes
Diminished not the hunger of the gredye.
Six chunks of melon did one personne ete
And fruit salad in a like amount.
When that the Alfa-bêtes with their songes

Hath charmed the ears of the gentil folk



The gentil arte of conversationne.



The turnyng spit.

And many a wight right ful or wonder quod At the long lockes of these hairye chappes, Who couthe pleyen mynstralcye of Mersea syde.

And drove some of the companye a foote
To seek the solace of the Vagabonds,
Whose melodye was best preferred by some.
Tweye pipers played anoon bisyde the Bore
And betimes dispensed an eightsome on the
floore.

Garcon, Graham poll and Shand, propre felawes alle

Narrated jests of mirth and jolyte.

A splendid Balle for as I have descrived,
To dronke and speke and daunce a while and

Is pleasaunt phisik, by corpus boones I say.

The Christmas Card, 1964

THE CHISCHIA	is curus, 200
Christmas Card Order Form.	Please use BLOCK CAPITALS
NAME:	No. of cards required
ADDRESS:	Cost at 4s. per doz£ s. d.
	Plus postage, 1st doz. 9d.
	additional doz. 4½d. (Orders over 5 doz., post free)
	Total £ s. d.
	2000 2000 TO 1000 2000 2000 2000 1000 1000 1000 100

Please enclose remittance with order, addressed to The Manager, The Journal, St. Bartholomew's Hospital, London, E.C.1. Cheques and P.O.'s payable to St. Bartholomew's Hospital Journal.

Signed

ABERNETHIAN SOCIETY QUESTIONNAIRE

By David Jones

The new Abernethian Society committee was elected on the 6th June, 1964 and immediately confronted with two unpalatable facts. There was a noticeable fall in the attendance of meetings and a general dissatisfaction with the subject matter. As every member of the Students' Union automatically belongs to the Abernethian Society, it was thought a general questionnaire might be useful. The aim was to provide an opportunity for suggestions from the members and the committee to reassess the Society's activities.

THE QUESTIONNAIRE

Members were asked:-

- Which most influenced their attendance at a meeting, the subject or the speaker.
- Which class of topic they were most likely to attend, medical, para-medical or non-medical.
- 3. To give reasons for their choice in 1 and 2.
- 4. To give suggestions for topics and speakers.
- 5. To add any other remark they would like to pass on to the committee.

It is interesting to analyse the attendance over the last three years before looking at the results of the questionnaire. This provides a baseline and enables us to compare the interests people claim to have with the type of programme they actually attend.

In the last three years the society held 42 meetings. Of those, 20 were medical, 20 paramedical (e.g., "The psychiatric illness of Van Gogh" or the symposium on road traffic accidents) and only two had no medical connection. Attendance was assessed on the following rating: 0 to 50 bad; 50 to 100 fair; 100 to 150 good and over 150 excellent. (The total membership of the students' union is 550).

The following table shows the 'score' for medical and para-medical meetings:

	Medical	Para-medical
Excellent	2 meetings	3 meetings
Good	6 meetings	4 meetings
Fair	7 meetings	9 meetings
Bad	5 meetings	4 meetings
Examining t	he 'good' and 'e	excellent' attend

ances, 4 of the 5 'excellent' classed meetings were "sensational" topics such as Prof. K. Simpson's "Foul Play" and Sir John Wolfenden's "Crime and Sin", which had a record attendance of 210.

The three other such meetings all had 'good' attendances.

Of the nine meetings classified as 'bad' on the other hand, five were medical (among these were the only two on General Practice in the three years) and one non-medical. Finally it is worth noting that out of the seven symposia of the series, two of them had an 'excellent' rating while the other five were all 'good'.

The results of the questionnaire have been divided into the pre-clinical and clinical years

The pre-clinical students were almost equally divided as to the relative importance of speaker (65 per cent) and subject (55 per cent). Paramedical (65 per cent) were preferred to medical subjects (25 per cent) while only 10 per cent wanted non-medical subjects. Broadly speaking this was because they found medical subjects too difficult and felt they could attend non-medical ones elsewhere. Of the subjects they suggested, psychiatry, biochemical and pharmacological research were prominent. Many complained that the meetings are held at an inconvenient time (5.45) which leaves a long wait after they have finished work.

The clinicals produced more conclusive figures for their preferences. 64 per cent were more influenced by the subject and 36 per cent by the speaker. Again 64 per cent requested para-medical subjects, 23 per cent non-medical and only 13 per cent wanted to hear medical lectures. Perhaps this was explained by the person who wrote "Fed-up with medicine by 5.45". Most people wanted subjects not dealt with in the formal course, but which would broaden their general medical outlook. Some extended this further to include the arts and literature. The extensive lists of subjects given endorsed this preference: psychiatry and medical education were again prominent. Although one pessimist suggested "How to make money in the N.H.S." as a title, only two people wanted to hear about General Practice. It was interesting that only two people again (both female) suggested topics of the popular

'sensational' class mentioned above, such as abortion and birth control. The clinicals' main criticism was that the reading of the minutes gave the meeting a bad start and some felt the whole atmosphere too formal. The publicity was thought to be poor by a number of people including two members of staff. There was also an optimist who just wrote "More beer".

When Abernethy founded the society in 1795 the committee then stated that its aim was ". . . the reading and discussion of papers ... relating to medical science and practice". The phrase "relating to" seems to justify the popularity of para-medical subjects as shown by the review of the last three years and the questionnaire. Both preclinicals and clinicals preferred these topics, but for different reasons. It appears that clinical students feel the Abernethian Society can play an important part in broadening their general medical education. something an already overcrowded curriculum has little time for. The preclinicals, because they are not so advanced in the course, feel they can also get more out of the broader, rather than specialised topics. In view of the fact that 50 per cent of us will enter General Practice, it seems a pity that meetings on this vast subject (also only sparsely covered in the curriculum) are both badly attended and rarely requested. Abernethy intended the Society to provide an opportunity to hear authorities talking on their specialities. In spite of the students' ostensible disinclination to attend medical subjects as shown by the questionnaire, in the last three years they were almost as well attended as the others. This is an interesting discrepancy. Is the medical student still afraid to admit a genuine interest in his subject? Few were prepared to admit an interest in the more sensational subjects by requesting them openly, yet these still drew the largest audiences. The suggested subjects and criticisms were helpful. The committee intends to discontinue the reading of minutes but will publish a record of proceedings. An attempt will be made to improve publicity.

This is the students' own society. The information provided by the questionnaire has enabled the committee to plan the sort of programme that members want. This is the job of the Committee but the attendance is up to

FIFTY YEARS AGO

From the Bart's Journal of October, 1914

AN APOLOGY TO THE EDITOR In August or July last, Mayhap, Sir, it was in September— The time, you indicate, has passed, So you would wish me to remember,—

I would, I promised you with solemn Confidence, produce a column.

For several weeks without success I struggled with the situation; Five hundred lines, Sir, more or less, Nor any sign of inspiration;

I must conclude—in fact, the case is
A chronic form of mental stasis.
The war, you say, could well provide
A subject for my dissertation;
For ten successive days I tried
To exorcise the German nation.
Result—disorganised in toto

My cerebrum and my Onoto.
Well, there you have three verses, just
By way of gentle introduction.
(Marvellous what one can who must);
Observe their curious construction.

A word or two and lo! there stands a Verse, or otherwise a stanza.

A scientific discourse might
Perchance excite a Muse to action.
I think the chances are but slight;
To theorise with satisfaction
Is futile in this disconnected
Style I seem to have selected.
"The influence of port on gout,"
Or "Ochronosis in a plumber"

Fails as a subject, save it served to Rhyme with the gent I've just referred to. Might I suggest a sound device To help a poor aphasic blighter? You might, e.g., print one verse twice. And add some stars to make it brighter,—

Do you suppose that they would spot it? Anyhow, there's your column. Got it?

Except in prose. The subtle gumma

Are difficult to write about

A. B. P. S.

WHITHER SHALL WE WANDER?

By Jasper

A FEW London pubs have achieved country-wide fame. It is difficult in most cases to see where these differ from other pubs, but they are always packed full. One such pub is **The Grenadier.** Not an easy pub to find, it is situated at the end of Wilton Row, off Wilton Crescent, best approached from the North corner of Belgrave Square. Thus after adjusting your compass, orientating your map and passing some of the plushiest mews houses in London you should find yourself fighting your way to the metal-topped bar, to be served by a white-coated "officer". Then relax with your beer and admire the surroundings. Nothing very special in the panelled bars, except perhaps the prints of men in those funny hats, and here and there a pistol. Note also the grapes growing over the entrance (on my last visit they were a little hard) and all the funny people that drink there. Well, there you are, a pub that they've even heard of in Scotland.

Now make your way back to Wilton Crescent, along Belgrave Mews into Motcomb Street and first right into Kinnerton Street. This street holds two very good pubs, the first you come to is the Horse and Groom. A friendly pub with a cosy atmosphere; small and always crowded. Close to St. George's Hospital you may hear a little shop-talk, but on the whole a pleasant place. When you have finished there make your way along Kinnerton Street to the Nag's Head. Mind you don't miss it, as it's reputed to be one of the smallest pubs in the country and when there are more than six people in the bar it's crowded. But it's splendid pub especially when full, and sells excellent sandwiches. The decor is sober, but not its atmosphere, (it can't be when you're that close to the other



THE Horse and Groom in Kinnerton Street.

drinkers) and it seems to be a haunt of Taxi-drivers. All these pubs sell Watneys, at 2/2d. a pint for special, and the Nag's Head sells draught Guinness, which is another point in its favour. So if you're spending a wandering evening in Knightsbridge make sure you visit these pubs.

If it's a pre-dinner drink you want, the **Lowndes Arms** is very picturesque. This is a short walk away at the junction of Chesham Street and Eaton Place. Another Watneys House and furnished in a typical Watneys way with velvety wall paper, it's a good place to start an evening. There is also a garden at the back and I'm told it used to be a haunt of the Rugger club, but despite this there is no lostility towards Bart's.

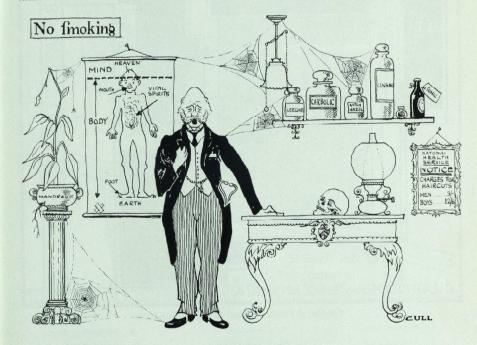
FRESHERS SUPPLEMENT

ABOUT OURSELVES:

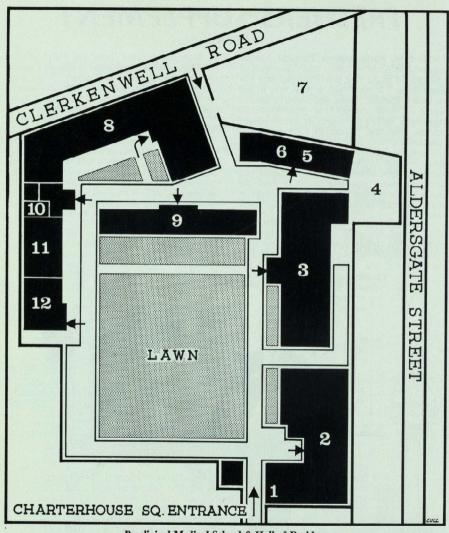
The first St. Bartholomew's Hospital Journal appeared in October 1893. In those days it was only 16 pages long and contained very few illustrations. Its aim then, as now, was to put on record clinical papers and lectures for the benefit of both student and practitioner, to promote a feeling of esprit de corps among students past and present in their work and amusements, to record their social activities and sporting achievements, to publicize anything original in the way of articles, short stories or verse contributed by its readers and lastly and most important of all to bind the past with the present and maintain the interest of old students in the Hospital and its activities.

With this Journal comes the eighth clinical supplement: the supplement is printed quarterly and first appeared in January of last year Besides containing papers of Medical interest it allows us to print more social and paramedical articles in the Journal proper.

The Journal office is in a large cupboard off the first landing of the stairs leading up to the Pathology teaching department. We hope that freshers with or without journalistic knowledge will help us to produce a worthwhile Journal with constructive criticism and/or articles on any topic for consideration by the publications committee, and we take this opportunity of welcoming them to the hospital and wishing them every success in the years to come.

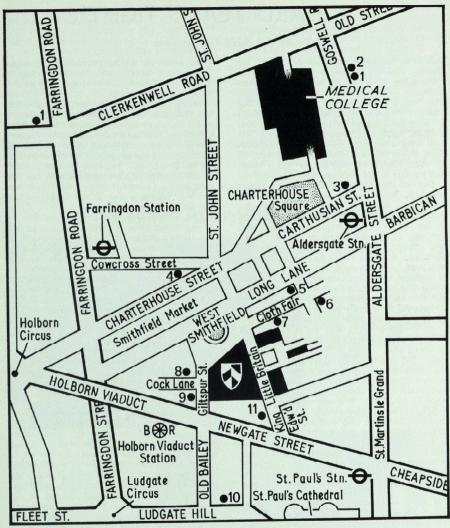


".... AND IN WELCOMING THE 1964 INTAKE, MAY I SAY THAT BEFORE LONG, NEW STUDENTS WILL BECOME AWARE THAT WE HAVE HERE A CERTAIN HISTORY AND TRADITION....."



Preclinical Medical School & Hall of Residence

- 1. Warden's House.
- 2. Anatomy Dept.
- 3. College Hall.
- 4. Tennis Courts.
- 5. Gymnasium.
- 6. Squash Courts.
- 7. Car Park.
- 8. Physiology Block.
- 9. Biochemistry Dept.
- 10. Student Health.
- 11. Library.
- 12. Research Library.



Area Around Bart's

- 1. Clifford's.
- 2. Josephine's.
- 3. Charter Press.
- 4. Blue Posts.

- 5. Old Red Cow.
- 6. Hand & Shears.
- 7. Bart's the Great.
- 8. Pete's Caté.

- 9. White Hart.
- 10. Lipman's.
- 11. G.P.O.

A HARD YEAR'S TIGHT

by Our Social Correspondent

It was a beautiful autumnal day when Ian Bolding first found himself in the Extra B. "It's more of a social side" the selectors grinned, "we think you'll find it to your liking." The Prop forwards carried him off to the Bar and our hero was launched into life at Bart's Looking back during the Long Vacation a year later the whole thing seemed rather hazy. He had done everything, the selectors had been right, but it was so difficult to remember. It all seemed mellowed with gin, or was it bitter, well anyway it had been one hell of a year!

The first term went pleasantly enough, rugger practices, booze-ups in Bayswater, and did somebody mention Vivas? On Saturday nights there were hops in College Hall organized by the Sports Clubs. A pint at the bar with the lads, or dim lights and the music of the beat groups. "Well with this rhythm and blues and that, the mods had nothing on us that year." It was however the Soccer Club or perhaps the Wine Committee's best bitter which was principally to blame for the night that Ian first saw that nice blonde junior pro and started to lose all incentive to master the art of cooking spaghetti single-handed!

In November there was the Rugger Club Ball, or was it the Boat Club Ball or perhaps the Barbecue Ball. Anyway there was one every term. The ground floor and grounds of College Hall were thrown open to the festivities with at least two bands, supper and a cabaret for thirty shillings. (The pipers had to be paid extra to go away). Not only that but it was amazing really, but they had explained that it was all because we ran our own Wine Committee. Bolding remembered that the Barbecue had been particularly sumptuous with three bands, roast pig, marquee on the lawn and illuminations. The Wine Committee had subsidised it to try and get rid of some of their profits!

Autumn rolled into Christmas and the Ward Shows. Now our hero, despite appearances to the contrary, was under the muscles a first class pianist and was quickly snapped up by the Outpatient Clerks to play in their show. Eight Wards, four on Christmas Day and four on Boxing Day saw "Our Latest Conception" and the Governors provided a barrel of beer. Two or three of their less questionable numbers

were chosen for the Pot Pourri, the Cripplegate Theatre saw three nights of revue and the Pot Pourri party brought Christmas at Bart's to a well oiled conclusion.

In the Spring term Ian moved to a colder but definitely more independent habitation, a newly decorated flat at the Angel. He launched it with the firm party of the first time dressers. The flat unfortunately had to be redecorated. February, and the Hospitals Cup found Bolding on the Touch line. We were up against Guy's in the Quarter Finals, and what with our best men having Glandular Fever and Finals, and the Ref. having a son at the Charing Cross . . . Still it was a great game.

The Bumps were held in May and Bolding having rowed twice at School was heaved into the Rugger Boat. Bart's had five crews on the river; First, second and third eights, Rugger boat and a Gentlemen's boat. On the first day the Bart's Rugger Boat rowed over, the second day they were bumped by the Thomas's Rugger boat. But on the final day, after a gruelling battle our rugger men bumped their rivals from Thomas's, and honour was restored.

Through the dim recollections of the river, Ian suddenly remembered himself in a toga and his part in "Tiger at the Gates", the Drama Society's Annual production. A small part agreed, but undoubtedly crucial to the play and excellently executed. Characteristically of Bart's as he now realised, the after play party was excellent.

On View Day, the Hospital Governors view the Hospital and in their wake followed our hero. Noting to starboard the Photographic Competition and to port the spot where Sherlock Holmes met Dr. Watson he steered straight ahead for the excellent tea.

The View Day Ball was the outstanding event of the year. That year at the Café Royal, Ian wined and dined in splendour beneath the chandeliers and danced to the orchestras, beat groups and steel bands provided. Beau Bolding was even seen at the gaming tables, tossing the last shilling of his grant to the croupiers before sauntering out into the London dawn.

But this wasn't the only time that term that Ian saw the dawn. The other less cheerful but ultimately triumphal occasion had been some miles south of Gatwick on the Annual Stroll to Brighton. Ian belonged to the "plimsoles and no beer through Streatham" school. At dead of night he arrived at the Bart's post. "Sedated with codeine and cocoa...no...no...no... I mean fortified with sausages and cornpads I staggered on." Friendly faces whispered "It's only seventeen miles now." It was all lies, it was seventeen and a half. He reached Brighton in the late hours of the morning and some weeks later was repayed for his efforts with a magnificent Guinness lunch and the Stroll tie.

Sports Day was fine and sunny, and Ian's feet had recovered at last from the blisters of Brighton. Students and Staff, wives and girl friends were all there to see a few records broken and the Dean win the Staff Handicap.

In the evening the Club House resounded to the beat of drums and beer tankards. It wasn't necessary to be an athlete Ian thought. In your first year you had the tremendous boost of being three times as fit as anyone else at Bart's.

"Ah, yes," mused Bolding as he sipped a Campari on that Italian terrace, "a year to remember." But he'd missed a few things; the seven-a-sides, the six-a-sides, the Wine Committee jaunt to taste Champagne. Still term was only three weeks away, and reports from England had it that social secretaries were hard at work conjuring up even more delights for this year's Social Season. He'd have to be careful not to improve his rugger though, it was imperative to stay with the good old Extra B.

The New Abernethian Room



The long awaited opening of the new Abernethian Room took place on August 24th. The opening was marked by the distribution of free beer by our great benefactors, the Wine Committee. It had been hoped to have the room operational rather earlier in the year but further delay occurred when the building was requisitioned by the Steward's Office during renovations to their own edifice.

This wooden temporary hut consists of a large ground floor room at one end of which is a full size snooker table, occupied by dedicated performers for at least twenty hours of the day. The rest of this large room is studded with small tables around which

are huddled the pale, drawn faces of the inveterate gamblers. The room is furnished in contemporary style with many comfortable chairs. The lack of sleeping accommodation pointed out in 'Vox' last month is oft repeated in the 'Suggestions Book', a volume slowly filling, for the most part, with the inane scribblings of small time authors. Above the Abernethian Room is an oasis of peace, the reading room; it is here that one can peruse the daily papers and the current periodicals; all is peaceful but can it long remain so? It is rumoured abroad that the flowery chamber next to our tranquil reading room is soon to house the idle chatterings and garrulous gossipings of our female colleagues.



Literature

You are even luckier than usual to get your Journal this month, since our printers were burgled just as we were going to press. Our special investigators are still working on the case, but our strong suspicion is that some rival publication, which was short of material, hoped to steal a scoop at the expense of our columns. And what likelier culprit, when the timing of the dirty deed is taken into account, —than the Sun? But let me remind you that pityriasis rosea is a skin disease which is preceded by a large herald patch, and though often causing considerable irritation usually burns itself out after 6-8 weeks.

If you don't like the Sun either, try the Slimming News. The current issue has a fascinating article about prisons, in which the author decries the high-calorie diet which the inmates are forced to eat, with the result that they are often discharged overweight and having lost their figures. What would Dickens have said?

And then there is a little publication called Floodlight, which is the official L.C.C. guide to evening classes. Now the evenings are growing longer you should begin to think of ways of spending them profitably. The selection of courses offered by the L.C.C. is enormous, but particularly to be recommended are Clear Thinking, The Art of Conversation, and Lace Making, or if you are already well versed in these, a shorter course in Lino Laying.

A computer has been used to compare Milton's Paradise Lost with Shelley's Prometheus Unbound; the result-Shelley was no more than a plagiarist.

Transliteration

A recent article in The Times has stressed the difficulties in translating proper nouns from one alphabet to another. This is particularly true for the English, or European representation of Russian people and places, since the Cyrillic alphabet contains six more letters than our own. Kruschev is a recurring example. Perhaps there is a political significance in the familiar Italian rendering "Kruscev", the enigmatic Polish "Chruszczow", and the menacing German "Chruschtschow"? There are problems in reverse too: the Russian attempt at the great English political philosopher reads "Gobbs", while "Shekspir" is the author of

"Gamlet", and "Evlin Vo" is a popular, though at first sight obscure. English novelist.

Industry

There has been much back-slapping over the completion of the Forth Bridge, and there is no denying both the advantages it will bring and the excellence of its construction. But it is salutary to remember that the idea was born in 1929, and approved in principle in 1946. Let us hope that similar procrastination no longer plagues the Channel tunnel plans, which are already 160 years old, and the more recent suggestions for barrages across Morecambe Bay and the Solway Firth

John Bloom's answer to liabilities of over £4 million was a short holiday in New York But he and his wife did at least fly economy class, (only £91 each).

Medicine

Hormones are more in the news than ever. The practice of feeding cattle on Stilbæstrol is becoming more widespread, since it is both a quicker and a cheaper method of fattening them than castration. So if you want a job as an attendant in a harem, don't miss your Sunday joint.

Criticism of smoking has been added from an unexpected quarter. A recent survey of 1,300 pregnant women has shown a statistically significant increase in premature deliveries amongst the 45% who smoked during their pregnancy. If advertising restrictions are eventually imposed on cigarette manufacturers, perhaps they will be able to fall back on recommending their products for medical induction: certainly more popular than castor oil.

General practitioners have given a unanimous welcome to the Minister's proposals for helping them to pay for staff. Now at last every practice will be able to afford receptionists, secretaries, and perhaps even nurses, all of whom will lighten the practitioner's burden, and leave him more time for patient carc.

The Election

If your mind is still your own by October 15th, don't waste the grand opportunity that democracy gives you. One lady-voter at a recent bi-election took a violent exception to the Labour candidate's table-manners, and being determined to prevent his election, put a large cross against his name on her ballot-slip.

A CONSERVATIVE VIEW OF THE NATIONAL HEALTH SERVICE

By Mrs. H. M. Weaver

A Doctor's Wife and Conservative Councillor

Health, ideally, should not be the subject of Party Politics-it is too valuable an asset to be bandied about as a party political gimmick. However as long as we are a free democracy with a Party Political system it is inevitable that it should be so. It is in the very nature of a free democracy that the two major parties should have different ideas for a perfect health service and it is true to say that the Health Service owes something to each of the parties,

Liberal, Labour and Conservative.

Many Conservatives view with some concern the form into which the Health Service has settled. They know that here, in this country, we have a service which is bettered nowhere else in the world and which can do a wonderful job if only it is streamlined and brought up to date without losing its individuality. Successive Ministers of Health have known that there was something wrong in the structure, particularly on the General Practitioners' side but have been unable to put it right owing to the very fact that they are Conservative Ministers and as such don't believe in forcing a system on a body of people without, at least, a majority agreement. They are painfully aware that it was Aneurin Bevan's 'accept or else' terms which caused the present near crisis in the service. Few of the then young General Practitioners just out of the Services after six years of war were able to risk losing their compensation by sticking out for reasonable terms of service in 1948. Many of these young doctors had come home to wives and families and the attendant responsibilities and so were at the mercy of

The doctors, to my mind, have almost belied the fact that an impressed body doesn't give quite of its best but now there are increasing signs of unrest. The thought that this was the cause would. I feel, be alien to Socialist philosophy. Bevan relied on their necessity in the first place and later, successive Ministers have relied on the conscience of the Medical Profession. Herein lies the danger of Nationalisation—it is so difficult to put right that which is wrong once it is a 'fait accompli'.

those then in power.

In its inception the National Health Service was conceived by the Liberal, but almost non party political, Lord Beveridge and it was the implementing of this scheme by Bevan, with alterations of his own, in almost indecent haste, that has caused most of its snags. Even Conscrvatives sometimes forget that the Health Service has its roots deep in History and Disraeli's Public Health Act of 1875 was an important forerunner. Sir Winston Churchill was associated with the Act of 1911 which was also a forerunner of the present act. It was Sir Winston Churchill and a Coalition Government that asked Lord Beveridge in June 1941 to consider and report on various social insurance schemes and allied services then in operation and one of the recommendations in his report was the establishment of a comprehensive National Health Service. This was accepted by the Coalition Government which published its own in a White Paper in February 1944. Even the most fair-minded tend to attribute the scheme wholly to the Socialists, forgetting the real facts.

The Health Service has much to commend it-doctors no longer have to wonder whether their patients can afford the necessary drugs and treatment-they can prescribe what they think is really needed—this part appeals to most good General Practitioners and specialists.

It is a fact that the British Nation is fitter and longer lived than ever before. Many diseases which were commonplace and deadly are no longer the scourge they were: to name only a few—T.B., Rickets and Diphtheria—and for this we certainly have to thank the Health Service. Pneumonia is no longer hopeless, old people live healthily to a ripe old age and if we are more conscious of some other diseases I think that is perhaps due to better diagnostic powers on the part of the doctor and higher intelligence and better education on the part of the patient.

Doctors are and are always likely to be individualistic and therefore it is practically impossible to get a firm agreement on exactly what they want. I regret to say it but I find doctors as a body, woolly-minded about administration. They seem to use up all their administrative abilities on medical practice and have neither the time nor the energy really to get down to thrashing out a workable scheme which will please the vast majority and provide a better service both for patient and for doctor. There is no doubt at all in my mind that should they do so, the present Minister of Health will do his best to implement it. In fact his recent statement about General Practitioners' expenses seems to bear this out.

Of course the Health Service embraces many other things besides medicine. The dental service is excellent and provides an admirable school dental service too, which should produce a generation of youngsters with better teeth than their parents or grandparents. The Dental Service has lost nothing by the charges imposed, in fact if anything it may have gained in that extraordinary way things do when one has to pay-to some people at any rate. Rather on the basis of—"the more you pay the better it is"—a fallacy we know, but an extraordinary number of people seem to react this way. Spectacles too have a charge and this doesn't seem to have cut down the number of people who wear glasses-rather the reverse.

A demand for privacy when you are ill should be able to be met if wished for—and here Conservatives realise that people differ widely—some like privacy while some dread the loneliness of a private ward. Some of us would like to see it possible for private appointments and visits with General Practitioners whilst getting drugs on a National Health Service prescription, and feel that this is a logical follow-on from the fact that a patient on the National Health Service can consult a specialist privately if he wishes without opting out of the Service.

The majority of Conservatives I have heard discussing this subject don't feel that 2/- on prescriptions is a real hardship to many but they would really like to see it abolished for the old age pensioner in rather the same way that pregnant women and youngsters don't pay dental charges and in the case of under-21's—optical charges.

We, the Conservatives, feel a great need for the Voluntary Services. We would dislike the disruption and disbandment of those voluntary bodies which contribute so much to the Health Service. The W.V.S., the Red Cross, the St. John's Ambulance, etc., "Meals on wheels" alone must save hospitals from having to admit many hundreds of old folk who are not capable of feeding themselves properly and therefore subject to the resultant diseases. The personal and non-bureaucratic touch introduced into peoples' lives by these services is of incalculable value and this they didn't take into account when they expected to do without all these services when the State took over. Knowing the value to both the giver of the Voluntary Services and the taker the Conservatives have never wished to see them done away with.

Our own hospital was in great straits at the beginning of the State Service because the Hospital Ladies Sewing Circle were given to understand that their Services would not be required and the mending for which they had previously made themselves responsible piled up to such an extent that they had to be begged to take it on again along with many other things under the name of the Hospital Friends.

In many towns W.V.S., etc., take a mobile shop and library round the wards, read to the blind and the aged, run Darby and Joan Clubs in the Old Peoples Homes, help them to learn to knit and sew and make baskets, etc. They do escort duty for children who need to go for treatment at hospital when the mother for some reason cannot go. If all these things were done on a paid basis, apart from the colossal addition to the cost to the National Health Service, they would lose that little personal touch that is so valuable.

The National Health Service was never meant to put an end to voluntary effort—it was meant to improve the bad and keep the good. People would do well to remember that contrary to common belief it was the Socialists who first introduced charges into the National Health Service. They produced the legislation to make the charge in 1949 and made the first charges in April 1951.

I have deliberately steered clear of statistics in this article as most of these refer to the Welfare Services as a whole and not solely to the National Health Service, but I will just mention that we are now spending more than double the amount spent on the Service in 1951—that is £1,000 million per year compared with £486 million in 1951.

I end with a quote from a Socialist M.P. (the Rev. Llewelyn Williams) in the House of Commons in 1963.

"We can still legitimately claim to have the the finest health service in the world".

OTHER PEOPLE'S CARS: 1951 DOUGLAS 90 PLUS

By J. M. Robinson

Although I have owned motorcycles and driven a good many miles on two wheels I have never been an enthusiastic motorcyclist: I feel happier with four wheels on the ground. However the sight of a vehicle which is a really fine piece of engineering and craftsmanship stirs my enthusiasm, whether it has two, three, or four wheels, and Peter Milla's Douglas creates this impression. I feel



sure that no one who has seen this machine can have failed to be impressed by its apparent complexity and immaculate condition.

Peter's machine is a 1951 Douglas 90 Plus and has an engine capacity of 348 c.c., having horizontally opposed twin cylinders with overhead valves. The compression ratio is 9.5:1 and power output is at least 25 b.h.p. at 6500 r.p.m. with a safe rev. limit of 7500 r.p.m. As the name implies the top speed is in excess of 90 m.p.h. and works racers have been timed at 120 m.p.h. This performance is adequately matched by the brakes which are 9½ in. diameter front and 7 in. rear and 1¼ in wide, by M.O.T. standards they are well over 100 per cent efficient. The bike has a wide ratio gear box for road use, though close ratio boxes were made for racing. Fuel consumption on long runs is as high as 85 m.p.g. and is about 60 m.p.g. in London.

The history of these machines dates back to 1950 when they were produced to race at the Isle of Man Clubman's Junior TT for production machinery, an event no longer held. The 90 plus was developed from a bike produced in 1946 using a similar engine layout. In 1948 these had some success at the Isle of Man coming 5th and 6th in virtually standard form. This inspired the 90 plus which was born with a not very promising future as the Douglas firm was in the hands of the receivers; however Eddie Withers and the notorious Riley man Freddie Dixon, whose baby this was, persevered and between them produced two hundred and fifty in the experimental workshop at the works, Dixon actually making the cams himself. During their production they were progressively developed and changes to engines, cams, and brakes were incorporated into the design; these engines produced 33 b.h.p. and could rev to 11,000 r.p.m. Their efforts were rewarded in 1951 with a 2nd place at the Isle of Man. The roadholding of these machines was considered by the experts to be exceptional and this may, in part, account for their success against faster machinery. Peter fights shy of making any comment on the handling by saying that he doesn't consider himself to be in a position to cast judgment, but the confidence with which he handles the bike speaks for itself.

Peter's bike has had two racing owners who have had their share of success with the machine, however the third owner seems to have found it too much of a handful and only rode it once before abandoning it to the weather at the bottom of his garden. Thus Peter obtained the machine rather worse for wear last summer. The winter was spent stripping down to the last nut and bolt, and then painstakingly rebuilding, replacing, and remaking wherever necessary, and after a pause for Part 1, the job was completed, a few teething troubles were sorted out and it is now well on the way to completing its 2,000 miles running in.

As I have already said I am not too keen on motorbikes, and pillion riding is not one of my favourite pastimes, but I felt this was too good a chance to miss. After priming both carburetters the engine started first kick. The clutch would seem to be fierce and causes some judder, but once engaged the engine is extraordinarily smooth; the almost perfectly balanced engine gives a ride unlike any motorbike I have ridden. The acceleration for a 350 c.c. bike is astonishing and I found myself hanging on tightly to the rather narrow pillion seat. The braking was equally remarkable and served to slide me back onto the seat again. The London traffic did not allow any high speeds, but demonstrated the acceleration, braking, and handling excellently. As Peter said, it is gratifying to know that you can brake as fast, or faster than anything on the road; although things might not be quite so comfortable in the wet. Apart from a rhythmical clatter from the tappets and a whine from the clutch, the bike is surprisingly quiet, with the throttle wide open there is a healthy exhaust note but it is not excessive. The engine and exhaust emit a noticeable smell of Castrol R which seems to enhance the undoubted impression of competition breeding. It was a very pleasant change in a time when most people drive mass-produced vehicles to be driven by a very competent driver on a truly fine piece of machinery.

SPECIAL DEPARTMENTS_VII

THE DEPARTMENT OF DIAGNOSTIC RADIOLOGY

By R. A. Kemp-Harper

It is now almost seventy years since the discovery of X-rays by Roentgen and during those years dramatic progress has been made in the application and scope of X-ray examination of patients for diagnostic purposes. Progress has continued in recent years with the ever-widening field of vascular radiology. In 1946 the number of X-ray examinations carried out in this hospital was 23,000, in 1963 the number was 63,000; this reflects the steadily increasing demands made on the X-ray department as accuracy of diagnosis improves, and scope of examinations increases. Much of this work derives from the improvement in the quality of opaque media which are now available as the result of constant research by the pharmaceutical firms and of diminishing toxicity of the media. Great technical advances which have been made in the design and manufacture of X-ray equipment have also contributed. Improvement in the output of X-ray generators, with consequent shortening of X-ray exposures, switching which enables a series of films to be taken rapidly, improvement in quality and processing of X-ray films have all played their part. The latest improvement has been the advent of image intensification together with the use of closed circuit television and cinéradiography which have enabled moving pictures to be produced and studied. These

give an entirely different conception of Radiology and enable function to be studied, whereas anatomy only could be previously recorded. The increase in the volume and scope of the work has necessitated great increase in staff, and the training of radiographers and radiologists has had to be broadened. Many more patients are now X-rayed in the wards and surgical theatres, radiographers have to be available twenty-four hours of every day of the year and whereas in 1946 six radiographers dealt with all the work, 30 are now required. This stems not only from the great increase in the number of examinations but also from the fact that most modern techniques make great demands on time and staff. The School of Radiography which gives a two years' training for the M.S.R. examination has had to be enlarged to allow of a yearly intake of 14 students as compared with six in 1948 when the School was established. With the increase in volume and complexity of Diagnostic Radiology it has been rather unfortunate that additional space has been provided in a piecemeal fashion with X-ray department "metastases" in various parts of the hospital. This is an uneconomic way in which to provide accommodation being wasteful of money, equipment, radiographers' and radiologists' time, and causing great problems as regards

record-keeping, integration and administration. The opening of the Urological Cystoscopic and X-ray suite in King George V block, will add still further to these problems. Yet it would be churlish indeed not to acknowledge with gratitude the consideration given to the provision of equipment for the X-ray department, much of which is relatively new as it dates from the opening of the Queen Elizabeth II block in 1961, and the equipment in the old department in the Out Patient block has all been renewed over the last six years.

The Scope of Radiology

Of all the specialties, Radiology probably offers the widest scope in as much as it is in close contact with practically every branch of medicine and surgery. The only specialties which are less interested in Radiology are Ophthalmology and Psychiatry, yet these also call on the services of Radiology from time to time. It is therefore necessary for the radiologist to be familiar with procedures used in all branches of surgery and to be well versed in most aspects of medicine. More and more is the radiologist in contact with the patient as he supervises and carries out the necessary technical procedures which form part of the examinations. Barium examinations, of course, loom large in a radiologist's work but so also do urological procedures from intravenous pyelography to micturating cystograms. Biliary tract examinations must be carefully supervised and intravenous techniques are frequently required. The field of vascular work from carotid angiography to aortography, peripheral arteriography, renal arteriography and the positioning of a catheter in an artery for the perfusion treatment of a tumour by cytotoxic drug are all time-consuming, intricate and interesting techniques. To these may be added cholangiography, lymphangiography and the extremely wide and fascinating field of angiocardiography and pulmonary arteriography. More recently mammography has come to play an increasingly interesting and useful role in demonstrating and aiding in the diagnosis of breast pathology. It is surely true to say that radiology occupies an increasingly indispensable part in diagnosis, otherwise there are an extremely large number of unnecessary X-ray examinations!

The Training of Radiologists

Radiology as a specialty still offers opportunities of appointment to consultant status some years before this can be achieved in general medicine or surgery, nevertheless the training is comprehensive and arduous. Nowadays most doctors recruited to the staff of the Diagnostic Radiology Department have been registrars in Medicine and the majority already hold the M.R.C.P. The training for the Diploma in Radiology lasts two years unless some experience has been gained in a Chest Unit when permission may be given to sit the D.M.R. at the end of one and a half years. The trainee may be appointed at S.H.O. or Registrar level at the commencement of his training depending on qualifications and experience. Soon after obtaining the D.M.R. he should be eligible for a Senior Registrar post if he also holds the M.R.C.P. Two years after obtaining the D.M.R. he should sit the F.F.R. (Fellow of the Faculty of Radiologists) and if he obtains this, he is ready for a consultant appointment five or six years after commencing training. Both M.R.C.P. and F.F.R. qualifications are essential for a teaching hospital appointment, but the F.F.R. only will enable the radiologist to obtain a good non-teaching hospital appointment. The trainee at Barts is fortunate in that most of the major specialties are well covered within the hospital precincts, and there are the most up-to-date facilities for radiological investigation.

Radiology as a Career

Training has already been described and one of the eternal fascinations is that the radiologist must be a keen observer and a good detective. A slight change in bone texture, of soft tissue density, or a small flake of calcification may be the first clue to the presence of an unsuspected pathological process. The changes present may be pathognomonic and the diagnosis certain without conclusive, or perhaps even a hint of clinical evidence of the disease. Yet with the accumulated experience of nearly one hundred years of Radiology between the consultant radiologists on the staff, scarcely a day passes without some unusual radiographic appearance being seen which none of us has observed before, so protean are the manifestations of disease!

Close co-operation with one's clinical colleagues is essential to obtaining the best results from Radiology and although much is done to foster this, there is no doubt that accessibility of a department plays a most important part and it is therefore essential that in the rebuilding of the Out-Patient block, the X-ray department be situated on the ground floor to give the easiest access for both

patients and staff.

Research

With re-equipping of the old department and the opening of the Queen Elizabeth block, great opportunities have arisen for research work in Radiology and many projects are in train ranging from cardiac and pulmonary conditions, peripheral vascular diseases. neuroradiological problems, to the function of the rectum and anus, the function of the biliary tract, mammography, lymphangiography and the post-operative function of the stomach following vagotomy and pyloroplasty. This list is not comprehensive and I hope my colleagues will forgive some omissions especially in relation to the urinary tract. The scope therefore is great, new fields are always opening up and fresh problems arise in keeping pace with or providing information for the surgeon. To the radiologist with an enquiring mind there are ample opportunities for furthering the knowledge of Radiology and Medicine in general. especially in collaboration with his clinical colleagues. The contribution of upwards of fifty papers to the radiological literature by members of the staff of the department in the

post-war years gives some idea of the activities of the staff in this respect.

Teaching

Weekly meetings with staff of special departments, discussions on ward rounds and informal tutorials to housemen and those seeking higher qualifications take place, but there are still inadequate facilities for the undergraduate teaching of Radiology although only some slight adjustment to the curriculum is required. Students are expected to know a modicum of diagnostic radiology for the final examinations yet there is no systematic teaching. Teaching on one or two specialised units gives the student a completely erroneous impression of the incidence of disease and of the scope and limitations of Radiology. Students are always welcome in the X-ray department to see any examination carried out in which they may be interested; it is advisable that they should have some knowledge of the examinations to which they may ultimately ask that patients be submitted.

ANIMAL BITES

by L. S. Castleden

The other morning a schoolboy called at the surgery on his way to school. He gave the following history:

The previous evening he went to shut up his parents' chickens. It so happened that a vixen, who had cubs nearby, was in the chicken house. In the resulting fracas the lad was bitten on the hand. During the night the hand began to burn and throb.

On examination there were two punctures on the palmar surface of the ball of the right thumb one and a half inches apart. There was a corresponding perforation on the back of the hand. These injuries were obviously made by the canine teeth of the beast as it seized the boy's hand. The ball of the thumb was swollen, reddened and hot. It was obvious that the wounds were infected. There were no swollen lymph glands in the axilla or the epitrochlear region. He had no fever.

The wounds were cleaned with "cetavlon", dressed, and the arm put in a sling. He was given penicillin and made a rapid recovery.

When I told my agricultural son about this I was intrigued to learn that he had seen

several lambs suffering from foxbite. He had been working on a farm in the West Country studying sheep. Foxes abounded in the woods and made forays among the newborn lambs. Many lambs were carried off or killed. Those which were merely bitten practically all developed suppuration of the wounds. This suggests that foxes may carry an infective organism in their saliva.

This was the first case of fox bite that I had attended. In general practice animal bites are not all that uncommon so a few instances may be of interest.

There are three separate aspects of bites that should be considered:

(a) The type of trauma to be expected. This will depend on the teeth and strength of the animal.

(b) Infection. Certain animals carry organisms which are pathogenic to human beings, e.g., rats carry both the leptospira icterohæmorrhagica and the spirillum of ratbite fever, quite apart from contamination carried into the wound from the skin or clothing of the patient.

(c) Toxins actually injected into the wound by the creature, such as the poison of the adder or the vampire bat. (I am sorry to say that I have yet to meet a case of the latter in Essex).

The domestic pig, especially the boar, can inflict a wicked injury. As the ardent comparative anatomist will know, boars possess curved teeth known as tushes. They are incredibly sharp, as the following histories will amphasics.

A pig man was feeding a large white boar one morning. He was wearing jeans and light shoes. The boar barged against him and jerked his head up. The tush entered the man's leg near the external malleolus and laid the peroneal compartment of the left leg open as far as the knee. Luckily no important structures were cut but the length of the incision was about two feet. The lesson learned was that leggings or stout boots are best for stockmen.

Another case occurred at the Royal Show some years ago. The large white boar which ended up champion was receiving a last grooming from his owner when he shook his head to dislodge a fly. The point of a tush caught the exhibitor on the right knee. This man insisted on leading his pig into the ring. Afterwards he was found to have a hæmarthrosis where the joint was punctured. He was fortunate that timely penicillin injections prevented infection of the joint.

One probably sees as many dogbites as all the other animal bites put together (excluding fleas and other insects!). Dogs have not only long canine teeth and strong jaws but also a disconcerting habit of shaking their heads while retaining a grip of the victim. These mechanical factors ensure considerable deep bruising and laceration. There is no hydrophobia in this country thanks to quarantine but a fear of the infection of a dogbite remains and this ensures that a high proportion of the cases seek help. There is also in some cases a desire to "have the law" on the owners of the dog. It should not be forgotten that there is sometimes marked shock, both nervous and due to the injuries. Maybe, because folk who have been bitten are treated promptly I have the impression that dogbites are seldom infected.

The following histories illustrate:

1. A schoolmaster who was on holiday was helping out a local farmer. He was given a job hedge-trimming. The sheep dog was nearby. Suddenly the dog attacked him ferociously. The patient had a hard job to get away. He realised that he had unwittingly stepped over the body of a lamb which the dog had

evidently exhumed from a shallow grave, and regarded as his special perquisite.

On examination at the surgery both hands were damaged. The right hand had the pulps of the two middle fingers torn. There were also cuts and shallow abrasions on the back of the hand. The left hand was bruised and two fingers were punctured and swollen.

The wounds were cleaned and repaired. The patient was given injections both of prophylactic penicillin and tetanus toxoid booster.

2. At 10 p.m. one night my wife answered the telephone when I was already out on a call. It was a young gypsy girl who wanted the doctor to go at once to a village some seven miles away because she had been bitten by a dog. In answer to a question it was revealed that the skin was not broken, but the leg was bruised and she wanted the police to prosecute the owner of the dangerous dog. The policeman had said that a doctor should examine the leg. She was asked to come to the surgery tomorrow. "I am going to a funeral then," was the answer. When asked to come in now in a taxi she put down the phone in a huff.

There may be a moral to this story. Ferrets are only recently coming into use again for rabbiting after their decline subsequent to the introduction of myxomatosis. In my school days I used to keep them. They do not bite when properly handled, but when they do they are inclined to hang on. The result is deep puncture by the canine teeth.

The domestic cat will inflict bites but the more usual injuries are from the claws. Both may be followed by an infection which is known as "cat-scratch fever". There is local suppuration and adenitis as well as general inalaise and fever, following a few days after the bite. I cannot actually recall a case in this practice.

Rats will inflict bites which can be infected in two ways. Since the introduction of curare-like rat poisons there has been a marked decline in the number of rat bites due to removing rats from traps and the ancient sport of ratting with dogs or ferrets. The following cases occurred before full potentiality of penicillin was evident.

1. A farm worker aged 67 years was ferreting. His ferret was "laid up", and he thought he could hear it on a rabbit. When he felt in the hole his hand was seized by a rat which was clinging to the web of his palm as he withdrew his arm.

The injury was sufficiently severe to need two sutures in the dorsal aspect of the web of the right thumb. The stitches were removed after six days. The wound then looked a little blue but not grossly infected.

Two weeks after the original injury he was running a fever. The wound was dark. There

WHAT DOES



STAND FOR?

IT STANDS FOR security and peace of mind from the day you qualify—until the day you retire—and after. IT STANDS FOR the provision of advice on all your professional problems . . . for legal assistance in any difficulty or proceedings of a professional nature . . . for unlimited indemnity in respect of damages and costs in the event of an adverse verdict or a settlement out of Court.

IT STANDS FOR THE MEDICAL DEFENCE UNION the oldest and largest organisation of its kind in the world. Further particulars can be obtained from

THE MEDICAL DEFENCE UNION

Tavistock House South, Tavistock Square, London, W.C.1

Secretary Dr. Philip H. Addison Dental Secretary
A. H. R. Rowe,
B.D.S., F.D.S.

was dusky lymphangitis up the arm, and adenitis in the right axilla. A few days later generalised polyarthritis set in with affection of shoulders, elbows, hips and knees.

A diagnosis of rat-bite fever was made. He was treated with intravenous arsphenamine which reduced the fever but failed to control the arthritis. After transfer to hospital he was given a course of penicillin and he made a good recovery.

2. A young farmer's son made a nocturnal attack on the rats which infested his chicken house. A rat leapt from a perch and scratched him on the face as it fell to the floor. In spite of casual first aid he became ill. Five days later he ran a fever which at first was thought to be influenza. On the seventh day he sought advice.

On examination there was a temperature of 103° F. Pulse rate 90 per minute. He was complaining of pain behind the eyes and a severe headache. His neck was stiff and Kernig's sign indicated meningeal inflammation. The urine was dark due to the presence of bile. Albumen was also present.

The next day he was definitely jaundiced. He had frequent nosebleeds but there were no other hamorrhages observed. Weil's disease was diagnosed on the clinical picture and treatment with penicillin in full doses resulted in

steady improvement over the next few days.

Horse bites are seen on occasions. The hand is sometimes caught when sugar is offered injudiciously by children. There is quite amazing bruising when a soft part is nipped. I have seen both a blacksmith's bottom and a young horsewoman's breast as sites of massive hæmotomata.

Monkeys are renowned for mischievous behaviour so it is not surprising that a few cases are seen when the travelling circus makes its annual call. But no complications have been seen.

Man (and Woman) is known to bite and these injuries are also rushed to the doctor. Patients in an epileptic fit may not only bite their own tongue but also the finger of a well-meaning first-aider.

I recall savage bites which a manic Eastern sailor made on the arms of a shipmate.

It should be borne in mind that the spirochate might lurk in some wild folk's mouths and it is possible that a late lesion at the site of a bite is a primary chancre.

Gentler passions will also result in bruises on the neck, etc., of young women. These are known as "love-bites". They sometimes are followed by a late complication, the incubation period of which is some 40 weeks.

PENGUIN REVIEWS

Improve Your Athletics

Volume 1 Track Events by Peter Hildreth.
Volume 2 Field Events by John Le Masurier.
Price 6s. each.

One's first impression on seeing these two books is that it is impossible to cover the whole complex subject of athletics in two handbooks. But on reading them one realises that the publishers and authors are well aware of this limitation but have succeeded in producing a well balanced picture of the modern athletic scene. The best feature of these books is the excellent illustration of each chapter with action photographs from the Rome Olympic games with

comments by the authors.

Peter Hildreth is a very experienced competitor and has taken part in three successive Olympic Games. In the volume on track events, he leaves alone the problem of running styles and concentrates on training programmes and even more important the mental approach to modern athletics.

John Le Masurier is a national coach and in volume two deals with the technique and style which are so important to successful jumpers and field athletes. His comments and suggestions are first class and would go a long way to improving the reader's knowledge of athletics whether he is a competitor or a spectator.

David Goodall.

Sons of God, by Gwyn Griffin. Penguin. Price 3s. 6d.

Gwyn Griffin is well qualified to write this book about the dying British Colonial Service. He describes here the lives of Regional Police Officers, serving in a small British colony in North East Africa. The old boy of the Public School figures largely in all his worst failings. Reminiscent of Graham Greene, Forster and Masters, the men writing letters to their school magazine, half-castes envying deeply the 'Sons of God,' and the etiquette of dining out, are all brought together to provide a convincing background to an interesting plot.

The narrative involves the difficulties experienced by Superintendent Cecil Spurgeon, in his fight for the post of Deputy Commissioner. In an effort to gain some social success he must marry. His wife is a young French woman, who is accompanied by her even younger brother. The difficulties in procuring her acceptance prove to be insurmountable; unfortunately his choice is also questionable, because the young woman has rather a dark complexion, and her former environment of Alexandria is not the background suitable to the confined life of a small British community.

Killings and the public disgrace of officials prove to be the results of some 'shady deals,' and the determination of the Superintendent to accomplish his

I can thoroughly recommend this book, as readable and entertaining.

R. L. Cooper.

City of Spades, by Colin MacInnes. Penguin Books.

This novel tells of the adventures of Johnny Fortune, a Nigerian who has come to London to study meteorology for a year. Contrasted with this are the experiences of Montgomery Pew, an Englishman, in coloured society. Colin MacInnes adopts the Nigerian and the Englishman. There are also two interludes in the story which are in the third person, and these, I feel, are the best written parts of the book. The second interlude is an especially good account of a court scene, cleverly described with a superb ending. Somehow the alternate chapter business does not quite come off; a very hard task and not enough contrast is drawn between the two characters.

The story gets off to a good start, with Johnny, the Spade, arriving cheerfully in London with only £200 to last the year. He soon finds that he has inherited certain problems from a visit of his father's twenty years previously. Montgomery Pew, the Jumble (phonetic John Bull) is a welfare officer vaguely responsible for John's well-being. They become friends, and are shortly exploring the coloured world of drug addicts, petty thieves, pimps and prostitutes.

Although I enjoyed the book, (it was first published in 1957 and it's possible that the changing attitude to coloured immigrants has dated a little) I felt that something was missing. The characters seemed unreal, which was a pity, because basically it is witty and humorous and deserving of a place on your bookshelf.

A. R. Bailey.

OTHER REVIEWS

Leprosy in Theory and Practice, edited by R. G. Cochrane and T. Frank Davey. With a foreword by Sir George McRobert. Second edition. Bristol. John Wright. aviii, 659pp. Price 115s.

Dr. R. G. Cochrane, a Bart's man, is well-known for his contribution to the study of leprosy over a lengthy period, and this volume under his editorship indicates the tremendous growth of our knowledge of the subject in the past forty years. Whereas Dr. Cochrane was once able to produce a book of 8 pages on the subject he now heads a team of over forty experts contributing in their respective

fields. The book covers every aspect—history, differential diagnosis, classification, therapy and chemotherapy, physiotherapy, and, of paramount importance, prevention. The term "leprosy" is new fangled "Hansen's disease", which is a

This comprehensive study is authoritative and up-to-date. It should be in the hands of every leprologist, and readily available to all who might have to deal with isolated cases. A copy has been presented to the Library by Dr. R. G. Cochrane.

I.L.T.

CHURCHILL BOOKS for the NEW TERM

BACTERIOLOGY: Including Elementary Mycology and Parasitology

Holland and Brews MANUAL OF OBSTETRICS

388 text-figures.

By MARTIN HYNES, M.D., F.R.C.P. New (Eighth) Edition. 93 illustrations. Ready this month.

BIOCHEMISTRY FOR MEDICAL STUDENTS

By W. V. THORPE, M.A., Ph.D., H. G. BRAY, Ph.D., D.Sc., and SYDIL P. JAMES, Ph.D., D.Sc. New (Eighth) Edition. 58 illustrations.

DISEASES OF THE EYE (Parsons) New (Fourteenth) Edition. By Sir STEWART DUKE-ELDER, G.C.V.O., F.R.S., M.D., F.R.C.S. 21 Col. Plates and 450 Text-figures.

Ready this month

60s

A PRACTICAL INTRODUCTION TO PSYCHIATRY By C. M. B. PARE, M.D., M.R.C.P., By ALAN BREWS, M.D., F.R.C.P., M.S., F.R.C.S., F.R.C.O.G., Twelfth Edition. 61 plates (12 coloured) 8 illustrations.

ANAESTHETICS FOR MEDICAL STUDENTS By GORDON S. OSTLERE, M.A., M.B., F.F.A.R.C.S., and R. BRYCE-SMITH, M.A., D.M., F.F.A.R.C.S.

THE PRACTICE OF MEDICINE Edited by SIR JOHN RICHARDSON, M.V.O., M.A., M.D., F.R.C.P. Second Edition. 87 Illustrations. 37s. 6d. CLINICAL ENDOCRINOLOGY for Practitioners and Students

LAURENCE MARTIN, M.A., New (Fourth) Edition. 61 Illustrations. Ready Mou Abt. 35a

PRINCIPLES OF EPIDEMIOLOGY
By IAN TAYLOR, M.D., M.R.C.P., By IAN TAYLOR, M.D., M.R.C.F., D.P.H., and JOHN KNOWELDEN, M.D.. D.P.H. New (Second) Edition. 36 Illustrations. 40s.

DISEASES OF INFANCY & CHILDHOOD By Sir WILFRID SHELDON, K.C.V.O., M.D., F.R.C.P. Eishth Edition. 8 Colour Plates and 254 Text-figures. 56s.

A SHORT TEXTBOOK OF SURGERY By SIR CHARLES ILLINGWORTH, C.B.E., M.D., Ch.M., F.R.C.S. (Glass.), F.R.C.S. (Ed.).

Seventh Edition. 16 Plates and 254 Text-figures.

45s.

TEXTBOOK OF GYNAECOLOGY By JOHN HOWKINS, M.D., M.S., F.R.C.S., F.R.C.O.G.

Eighth Edition. 4 Colour plates. 4 Colour plates. 451 Text-figures.

RECENT ADVANCES IN ANAESTHESIA AND ANALGESIA

Edited by C. LANGTON HEWER. M.D., B.S., M.R.C.P., F.F.A.R.C.S. Ninth Edition. 48 Illustrations 50s. A PRACTICE OF GENERAL ANAESTHESIA FOR NEUROSURGERY By R. I. W. BALLANTINE, M.R.C.S., L.R.C.P., D.A., F.F.A.R.C.S., and IAN JACKSON, M.R.C.S., D.A. 68 Illustrations. 273, 6d,

J. & A. CHURCHILL LTD., 104 GLOUCESTER PLACE, LONDON, W.1



ACOUIRE THAT NEW ELEGANT HAIRSTYLE TO SUIT YOUR PERSONALITY.

MAYFAIR TRAINED STAFF IN MODERN, PLEASANT SURROUNDINGS

AT THE CITY BRANCH

-JOSEPHINE-

OF

REGENT STREET CLE 0464-3

ST. BARTHOLOMEWS HOSPITAL **VOUCHER FOR**

20°/ DISCOUNT AT **IOSEPHINE**

MONDAY-THURSDAY incl. 30 GOSWELL ROAD, E.C.I. VALID FOR OCTOBER, 1964

Clinical Examination, Ed. John Macleod. E. & S. Livingstone Ltd. 1964. Price 35s.

This excellent manual belongs to an age which is long past forgotten, alas. Written in the mannered. discursive style of a more leisured era, there is too much philosophy and far too many words for the average student. Solemn quotations begin cach chapter like inscriptions on the headstones of some ancient village churchyard. Yet this book will not rest in peace on the library shelves since it has many virtues. It is interesting, literate and enjoyable to read, and the text is generally well arranged. The absence of more than a brief mention of diagnostic radiology, electrocardiography, examination of the urine, and other aspects of bedside clinical pathology is presumably due to the title and to editorial policy, but no less astonishing, deplorable and unpractical in the present century, at least south of the border.

Introduction to Practical Organic Chemistry, by Mann & Saunder. 2nd edition. Longmans. Price

It is always a tragic experience to see an old friend become senile and even more harrowing when it is an unconscionable time a-dying. Hence this book is one of the most distressing I have ever read.

When the first edition was published in 1939 it was a fair reflection of the art of organic chemistry but the user of this second edition will get neither training in techniques nor exemplification of theory in a form appropriate to 1964.

Although all-glass apparatus is mentioned only two pages show diagrams of such ware. There is no mention of chromatography in the seventeen pages on purification. Lip service is paid to the idea of small-scale work but the recipe for the Kjeldahl estimation requires 500 to 5000 mg. of material per run. The preparations are given in cook-book style and the products are uninteresting, most being readily available by the cylinder, winchester, or even tanker. Many modern reagents receive no mention. The discussion of the experiments would make it appear that organic chemistry has not advanced beyond the 'lasso' theory of reactions.

Contrary to the hopes expressed in the preface this book does not cover the requirements of either the pre-clinical or the 1st M.B. examinations in this Medical College, at least. There are books available which descibe modern methods, apply the idea of the functionable group, and discuss both in the light of reasonably recent theory. Even at the low price of 12/- this book cannot be recommended.

SPORTS NEWS

OCTOBER CALENDAR

Saturday October 3rd

Head of River IVs. Rugger v. R.M.A. Sandhurst (A). Soccer v. Swiss Mercentile School (H).

Wednesday October 7th

Hockey v. St. Mary's (H).

Saturday October 10th

Rugger v. Old Blues (A). Hockey v. Beckenham II (H). Soccer v. Royal Vet. College (H).

Wednesday October 14th

Rugger v. C. U. XV Club (H). Soccer v. Royal Dental Hospital (A).

Saturday October 17th

Rugger v. Woodford (A). Hockey v. St. Georges (H). Soccer v. Westminster Hospital (A). Cross-Country University College Relay, Parliament Hillfields.

Wednesday October 21st

Hockey v. King's College, Cambridge (A). Soccer v. U.C.H. (H).

Thursday October 22nd

Hockey v. Jesus College, Cambridge (A).

Friday October 23rd

Hockey v. Selwyn College, Cambridge (A)

Saturday October 24th

Hockey v. Pembroke College, Cambridge (A). Rugger v. Esher (A). Cross-Country. London University League (Div. I).

Wednesday October 28th

Hockey v. Kingston G.S. (H). Soccer v. Institute of Education (A)

Saturday October 31st

Soccer v. Middlesex Hospital (A). Hockey v. Oxford H.C. (H). Rugger v. Harlequin Wanderers (A).

Indispensable Books for the Student

AN OUTLINE
OF PSYCHIATRY
FOR
STUDENTS AND
PRACTITIONERS

by F. J. Fish

This is a most readable and useful book for the undergraduate and postgraduate student in general medicine who wishes to learn something about psychiatry. An extensive glossary of psychiatric terms will be most useful to those fresh to the subject, and a further reading list, personally annotated by the author, will be of general interest and appeal.

Price 32s. 6d., post Is. Id.

THE 'SYNOPSIS' SERIES Ideal for revision purposes, this series is intended to supplament and not to replace the larger textbooks.

Each volume 7½ + 4½ inches

ANAESTHESIA (Lee). OPHTHALMOLOGY (Martin-Doyle).

Fourth Edition. 27s. 6d., post 1s. 3d. Second Edition. 27s. 6d., post 10d.

OTORHINOLARYNGOLOGY (Simpson, Robin, and Ballantyne). 42s., post Is.

PHYSIOLOGY (Rendle Short) (Ed. Vass).
Fifth Edition. 30s., post Is.

PUBLIC HEALTH AND SOCIAL MEDICINE (Essex-Cater). 55s., post Is. 3d.

RESPIRATORY DISEASES (Smart). 22s. 6d., post 8d.

SKIN DISEASES (Solomons). 30s., post 10d.

SURGERY (Hey Groves) (Ed. Cotton).
Sixteenth Edition. 52s. 6d., post 2s.

SURGICAL ANATOMY (McGregor).

Ninth Edition. 35s., post 2s. 3d.

SURGICAL PATHOLOGY (Kark).
45s.. post Is.

The following new titles are in course of preparation:
TROPICAL DISEASES. METABOLIC AND ENDOCRINE DISEASES
BLOOD DISEASES. RENAL DISEASES AND UROLOGY

John Wright & Sons Ltd., Bristol

BIOLOGY (Crow).

MEDICINE (Tidy).



THE MEDICAL PROTECTION SOCIETY

Second Edition. 52s. 6d., post 2s. 3d.

Third Edition, 42s., post Is. 4d.

Third Edition. 12s. 6d., post 8d.

Tenth Edition. 35s., post 2s. 3d.

27s. 6d., post 9d.

30s., post Is. Id.

CARDIOLOGY (Weitzman). 30s., post 10d.

CHILDREN'S DISEASES (Rendle-Short).

FORENSIC MEDICINE AND TOXICOLOGY (Thomas).

GASTRO-ENTEROLOGY (Chandler)

NEUROLOGY (Tatlow, Ardis, and Bick-

OBSTETRICS AND GYNAECOLOGY

(Bourne). Twelfth Edition. 35s., post Is. 3d.

ADVICE · DEFENCE

& FULL INDEMNITY

FOR DOCTORS

& DENTISTS AT HOME

& OVERSEAS

50 HALLAM STREET · LONDON · W.1
Secretary: Dr.H. A. Constable.
Tel: LANGHAM 9241

CRICKET CLUB AVERAGES-1964

BATTING:					
	No. of	Times	Total Runs	Highest Score	Average
Name	Innings	Not out			
R. S. A. Thomas	13	2	498	89	45.30
D. Husband	16	3	329	96*	25.30
	18	4	329	92*	23.50
H. Phillips		7	440	56*	18.33
C. P. Vartan	32	8			16.77
R. Higgs	20	1	318	49	
N. Griffiths	26	1	412	54	16.48
	15	0	222	77	14.80
R. Wood		1	447	50	14.41
J. Gately	32	1		32	12.12
G. Major	16	0	194		
J. R. Harrison	19	3	184	26	11.50
	29	0	320	33	11.03
N. Offen		1	106	31	9.63
P. E. Savage	15	4	100	31	7.05

Also Batted: B. Goldhill, I. Peek T. Bates, J. Kelly, H. Walker, J. Pogmore, A. Holt, R. T. Hawley, K. Rawlinson, D. Goldie, D. Delaney, M. Downham, T. Lloyd, B. Shorcy, D. Pope, A. T. Letchworth, J. Pemberton, R. Powles, W. Castleden.

BOWLING:					
Name	Overs	Maidens	Runs	Wickets	Average
P. E. Savage	 268.5	70	641	52	12.32
C. P. Vartan	394.2	97	999	72	13.89
	154	38	358	24	14.95
D. Husband			888	54	16.44
J. R. Harrison	 307.3	63			27.29
N. Griffiths	 183	24	655	24	
K Rawlinson	32	6	108	4	27

Also Bowled: I. Peek, W. Pagan, D. Pope, H. Phillips, B. Stoodley, D. Delaney, R. Wood,

CRICKET CLUB SUSSEX TOUR

Sunday, August 2nd v. Ferring. Lost by I wicket.

We arrived in good time for the start of our tour on a very hot day indeed. Once again we had a large crowd watching us perform on this attractive ground.

Bart's batted first, the two openers, J. R. Harrison and C. P. Vartan established themselves well, and half an hour after the start, the score read 54 for 1, the skipper having been comprehensively bowled. Matters went from good to had—then had to worse until we were all out for the paltry total of 113. J. R. Harrison 20. C. P. Vartan 40.

We quickly got back in the fight in the field thanks to P. Savage but alas after being 30 for 5 they recovered slowly to a score of 106 for 7. At this juncture, needing 8 runs to win they lost two wickets, and the score read 111 for 9. The Bank Holiday crowd by this time had become very silent, and fearing that the suspense would do them some damage, the skipper bowled a kindly full toss down the leg side bringing cries of relief from the spectators as the ball skimmed away to the boundary. J. R. Harrison 4 for 15.

We were well entertained before leaving to find our abode in Brighton.

Monday, August 3rd v. St. Andrews, Burgess Hill. Drawn.

This too turned out to be an exciting game—but one which perhaps we should have won.

Bart's openers R. Wood and J. Davies started off in fine form. All the locals were disappointed when Davies was caught, for they were hoping to see him put the ball out of the ground and break a window as in times past. However, they were well entertained by R. Wood who scored a dashing 77. At lunch we were 132 for 3—but being a hot day the batting slumped afterwards. Eventually we were all out for 190. N. Griffiths 38.

There was nothing spectacular that happened when we were in the field—except perhaps that there were three catches dropped in the opening over! Anyhow we took nine of their wickets for 159 runs, and failed to take the last wicket with more than half an hour to play. N. Griffiths 4 for 39.

Tuesday, August 4th v. Rottingdean. Won by 41 runs.

Having met the Rottingdean team in the Plough—or rather a representative member—the night before, we were well prepared for a true wicket, "the ball coming on to the bat," and consequently lots of runs. We were a little

doubtful when Rottingdean won the toss and put us in to bat, and it soon became obvious that the pitch would have been more suitable for "Rounders"! We were all out for 93—thanks mainly to some solid batting by G. Major 16, and J. R. Harrison who scored an undefeated 22 runs in true rustic fashion, including a six.

The Rottingdean openers were announced over the Tannoy, as were the Sussex Professional and local squire, but due to their inability to trouble the scorer the Tannoy went silent as the No. 11 batsman and announcer put his pads on—the score being 33 for 4. P. E. Savage bowled exceptionally well, virtually unplayable and angry, taking 6 for 12 and with C. P. Vartan taking 4 for 20 the Rottingdean innings terminated abruptly at 52.

Various theories were elaborated afterwards as to why so few runs were scored including the inability of the Bart's umpire to restrain his finger when Rottingdean were batting—emphatically denied of course.

Wednesday, August 5th v. Ditchling. Lost by 7 wickets.

Another very hot afternoon saw us batting first, rather tired after the previous game and subsequent events. We were all out for 130 on a very easy paced wicket. R. Wood scoring 40 and J. Gately 23.

A complete contrast to the Rottingdean wicket, this gave no help to any kind of bowler—except Carrots—and the only spark of humour when we were fielding was when one of their batsmen played a powerful shot straight back at the other, and hit him on the head with a crack that could be heard all over the ground. The bowler, Dr. Delaney looked non-plussed—and after the batsman regained consciousness he was declared fit by the local umpire.

After this they made 135 runs for the loss of only 3 wickets, Bart's being well beaten.

Thursday, August 6th v. Barcombe. Lost by 87 runs.

Bart's fielded first and after a good start P. E. Savage was unfortunate to pull a muscle and to stop bowling. However, we still bowled well, only lapsing when we allowed them 50 runs for the last four wickets. C. P. Vartan 4 for 25; J. R. Harrison 3 for 27.

There followed then the most extraordinary display of batting ever seen on this ground—even surpassing last year when we won after being 4 wickets for 7 runs, making 133 for

5. This time we were 6 wickets down for 11 runs—six of those runs off a fine shot by J. Gately. At this point G. Major and C. P. Vartan took the score to 57 for 7. J. R. Harrison then scored 17 runs in double time until bowled while attempting an attacking stroke. We were all out for 81.

Friday, August 7th v. Seaford Seagulls. Drawn.

This proved to be a sad day for the side for we lacked two bowlers the one injured and the other playing for R.N.V.R. The remainder took up the task against some very powerful batting on a beautiful wicket. The ground was surrounded by a flint wall, and the ball was dashed against this so hard and so often during the Seaford innings, that it resembled a bunch of feathers when they declared at 217 for 3.

However it must be said that Bart's may well have got the runs given an adequate amount of time for we batted well and fairly steadily apart from a little misunderstanding between R. Higgs and N. Griffiths—the latter being run out before putting bat to ball. We finished at 126 for 8—most of the wickets falling because of the need to score about 3 runs a minute. Afterwards we were excellently entertained by Dr. Sutton and his wife who gave us a cocktail party in their garden.

On tour:—J. R. Harrison, C. P. Vartan, H. Phillips, J. Gately, N. Offen, R. Wood, P. E. Savage, N. Griffiths, R. Higg, G. Major, K. Rawlinson, R. Powles, D. Goldie, D. Delaney, J. Davies, E. Lloyd, all of whom had a very memorable time.

ESSEX TOUR

Saturday, August 15th v. Clavering. Won

Clavering were put into bat and immediately found themselves at the mercy of our opening attack. In fact they collapsed for 49 runs. C. P. Vartan 6 for 18. J. R. Harrison 4 for 30.

R. Powles and D. Shand opened our innings and batted intrepidly putting on 9 for the first wicket. J. Davies came in and scored 4 then was bowled. J. Gately stopped the rot scoring 27, we finally passed their total for the loss of 5 wickets.

It was decided to play on after suitable refreshments and the remaining 5 wickets fell for the addition of absolutely no runs! In their second innings Clavering were all out for 62, this bowled out by J. Davies 7 for 27 and E. Lloyd 2 for 16. We passed their total for the second time and so beat them twice.



Have You Ordered Your
Christmas Cards Yet?
Application Form on
Page 415.

Sunday, August 16th v. Arkesden. Lost

Arkesden won the toss and elected to bat first. Unfortunately the Bart's fielding was not up to the normal standard after the revelries of the previous evening. However we bowled them out for 125. One of them scored four consecutive fours at a height through the slips.

Our batting was similarly uninspired although everybody seemed to enjoy trying to keep out of the way of the fast bowler, (who took 6 for 29). It was a pity however that while keeping out of the way the first few batsmen were bowled. However, a brief stand by C. P. Vartan scoring 39 and J. R. Harrison and then R. Powles—who managed to carry his bat after being instrumental in a run out, took the score to 89. The last 3 wickets fell for 6 runs and we were all out for 95.

Sunday, August 22nd v. Hill End. Won by 1 wicket.

H. Phillips captained the side and won the toss, electing to field. It was obvious that it

was a lively wicket and this was well utilised by B. Shorey opening from the bottom end. However, after taking a vital opening wicket he was dispatched to the boundary several times. In the end we bowled them out for 87 R. Powles returning some excellent figures taking 3 for 10; C. P. Vartan 5 for 25.

Our batting started confidently with N. Griffiths scoring 30 runs but there was no one to stay with him, and soon we were struggling with the score at 73 for 8. R. Powles batted cautiously until he stopped a fast rising ball with his front teeth. Retiring hurt, and eloquent, he left A. T. Letchworth and D. Pope to score the 10 runs to win. At length R. Powles was persuaded to put on his pads again to "face" the last two balls of the over. This he did without getting injured again—to the possible disappointment of the now enlightened spectators. A. T. Letchworth then dispatched a fine four in the next over to win the match.

THE CHARTER PRESS

5 CARTHUSIAN STREET, E.C.1 CLErkenwell 4551

(JUST ROUND THE CORNER)

WE CAN SUPPLY ALL KINDS OF FILES, FILE PAPER, NOTE BOOKS, WRITING PAPER, BRIEF CASES, Etc. . . .

> ALSO GREETING CARDS AND GENERAL STATIONERY

PRINTING WORK

OF ALL KINDS CARRIED OUT QUICKLY AT REASONABLE PRICES

Chance of a Lifetime

BARTS BOUTIQUE

GLOUCESTER HALL

Wednesday, 11th November 3.30 - 7.30 p.m.

BARGAINS FOR THE BOYS!
GLAMOUR FOR THE GIRLS!
SOMETHING FOR EVERYONE

HUNGRY?
BROKE?

THEN GO TO

PETE'S

FOR GOOD FOOD, QUICK AND FRIENDLY SERVICE

Opposite the Hospital

"ROUND THE FOUNTAIN"

Have you read the latest edition of "Round the Fountain", a highly entertaining anthology of verse and prose extracted from past editions of The Journal.

A note to the Manager of the Journal enclosing 3s. 9d. will ensure that a copy is posted to you immediately.



CONTENTS

Editorial	44
VOX	44
Lymphangiography in a Case of Bilateral	
Chylothorax due to Chronic Lym-	
phatic Leukæmia by A. P. Wyatt	44
Dr. Roderigo Lopez by A. Griffith	44
Around and About by Argus	45
Around and About by Aigus	45
A History of Stethoscopes	43
The Day Kut Fell by Col. W. C. Spark-	
man	45
Report of Chairman of Students' Union	45
Whither Shall We Wander? by Jasper	46
The Search for Old Drugs in British	
Guiana by D. P. Moody	46
The Early Days of Radiotherapy at	
Part's by N S Finzi	46
	47
Psychiatry at Bart's by C. M. B. Pare	
Other People's Cars	47
Book Reviews	47
Sports News	48
Oports Trems	

PUBLICATIONS COMMITTEE

Chairman: Dr. A. W. FRANKLIN.

Deputy Chairman: Dr. G. H. FAIRLEY.

Editor: C. J. KELLY.

Review Sub-Editor: G. R. HAMILTON.

News Sub-Editor: M. A. P. S. DOWNHAM.

Social Sub-Editor: Miss J. BELL.

Photographic Sub-Editor: B. C. P. LEE.

Manager: J. R. SWAIN.

Asst. Man. (Subscriptions): A. R. BAILEY.
Asst. Man. (Advertising): R. L. COOPER.

Nurses' Representative: Miss M. IRONSIDE.

Sports Sub-Editor: R. E. ATKINSON.

Artist: P. CULL.

EDITORIAL

Some months ago this Journal received and published a frank and outspoken letter about the use of medical language in front of patients. We agree with the writer that patients are often aware of the meaning of medical terms and vet despite this fact the teaching staff continue to use these terms in front of patients. In many cases it may be undesirable for the patient to know the exact nature of the disease from which he is suffering. All too often a patient with a serious disease is taught on before a group of students. During these discussions the patient, despite reassurance, may become aware, that his condition is not as harmless as he has thus far been led to believe. Better education and the advent of mass communication has led to improved knowledge of the meaning of medical terms: the chief culprits are television's entertainment through medicine, and the columns written in the women's magazines by doctors for the lay public. The public now know the meaning or approximate meaning of terms like "carcinoma", "neoplasm" and other terms used to avoid the dreaded expression cancer.

These changed circumstances deserve changed tactics on the part of those whose duty it is to teach medicine. Is it really necessary for a patient to be present throughout the teaching session? Surely not. The presence of the

patient is only essential during the relating of the history and examination; interesting physical signs may be elicited after this and then discussion should be carried out in a side room or at the other end of the ward. In Out Patient clinics there is even less necessity for the continued presence of the patient. We know that there are some consultants who make a point of discussing the case away from the patient but this practice should become universal.

It is not only in the case of serious illness that this practice would be profitable. In cases of minor severity the discussion of the various ramifications of the disease process may touch on conditions of extreme rarity or importance that have nothing to do with the subject under discussion. Further, the discussion will allow the patient a greater insight into his condition, will make him more conscious of it, and even perhaps encourage him to look it up in a library and may provoke a morbid preoccupation with his own symptoms.

On the other hand it could be argued that in the case of less serious illnesses, a patient who heard his own case fully discussed by a group of people might well be more reassured. This could be true, but only when the discussion is limited to the one case and not allowed to range around the subject. Reassurance in the cases of fatal illnesses must be done in private and not in the midst of many strangers however well meaning.

We do not wish to see the end of the traditional ward round or the abolition of proven teaching methods. We do want to see a more humanitarian approach to the patient. We believe that events in the world of mass education have passed by the hierarchy of the Hospital. Realisation of the increasing knowledge of the elements of medicine by the public must change the teaching habits of centuries.

Correspondence

THE OLDEST HOSPITAL

Sir,—In Miss N. J. M. Kerling's brief but interesting article on The Oldest Hospital in England (St. Bartholomew's Hospital Journal September 1964) pride of place is properly given to the two SS. John's and the other St. Bartholomew's hospitals, but no mention is made of St. Thomas's. And quite right too, of course, since its origins fade into legend.

Some readers of the Journal may remember and others may be amused to know, that in 1939 a very large notice board was raised at the southern end of Westminster Bridge opposite County Hall in connexion with an appeal for charity, and on this board it was boldly stated that St. Thomas's was the oldest hospital in (I think) the Empire having been founded in 1115. This was too much for some recently qualified doctors a little further downstream who planned an expedition to put matters in correct perspective. Unhappily the autumn of 1939 brought other problems and the forces assembled were scattered.

It did not matter. The Goddess of Vengeance had taken note and Nemesis persuaded Jove to loose a thunderbolt against this baseless claim. A little more was knocked down than was strictly necessary, but we must hope that, now that re-building is in progress, St. Thomas's will not once more risk the wrath of Olympus.

Yours faithfully,

Michael Harmer, 6 Hale House, 34 De Vere Gardens, London, W.8.

8th September.

INTERNATIONAL BONDS

Sir,—In a recent letter to the Journal, Ian Todd suggested a link between Bart's and a Middle Eastern School of Medicine. As a student at this Hospital and with certain family ties in Persia, may I voice support for this project?

It is true that Britain has lost a certain amount of Prestige in the Middle East; however this has been mainly political. In medicine Britain is regarded as a leader, and our medical training is so greatly admired, that Persia for example, is considering following our teaching methods.

If Bart's adopted a hospital in the Middle East it would not only be a great stimulus to the latter's educational programme but would be extremely enlightening to ourselves. I am sure there would be no lack of enthusiasm amongst students at the opportunity of seeing

the sort of diseases and conditions common in the Middle East, but rarely seen in this country. Perhaps Registrars also, could hold similar short term appointments etc. In return we could be host to some of their students and doctors, thus forming a closer link between the two hospitals.

We are all proud of our hospital, let Bart's lead the way, and take this opportunity to show the excellence of British Medicine.

Yours faithfully, Anthony Danesh-Haeri, Abernethian Room, St. Bartholomew's Hospital.

5th October, 1964.

KNIGHTS AT BART'S

Sir,—I observe on page 407 of the current Journal, which has just reached me, in the calendar a reference to Dr. Bodley Scott. Surely it should be Sir Ronald Bodley Scott, K.C.V.O. The same error was in the September issue. Nowadays members of the staff who hold the accolade are very rare, compared with days gone by. I recall in my first year at Bart's, that two out of the five full Physicians were Knights and two of the five full surgeons were also Knights.

Still, we must be proud to feel that three members of the active staff of Bart's have appointments to the Royal House, the other two apart from Sir Ronald, being Mr. J. C. Hogg, C.V.O. and Mr. F. G. Tuckwell, surgeon to the Household.

Yours etc., J. B. Gurney-Smith, Royal Earlswood Hospital, Redhill, Surrey.

ST. BARTHOLOMEW'S HOSPITAL GOLFING SOCIETY

The Society was founded in 1928. All past students of the Hospital, who are on the Medical Register and members of the Teaching Staff, are eligible to join, on payment of an entrance fee of 5s. The Club meets in June and October, and plays upon courses around London. There are several cups and prizes which have been presented by members of the club, and have been so donated that they allow even those beginners with a handicap of 24 to enter successfully into the spirit of competition.

Newly qualified men who are interested in golf, and anxious to maintain a link with the Hospital, should apply to the Secretary for membership.

James O. Robinson, Secretary, St. Bartholomew's Hospital Golfing Society, 149 Harley Street, W.1.

Calendar NOVEMBER

Sat. & Sun., 7th & 8th.

Dr. Cullinan Mr. Naunton Morgan Mr. J. N. Aston Dr. R. W. Ballantine Mr. McNab Jones

Sat. & Sun., 14th & 15th.

Dr. Hayward Mr. Badenoch Mr. H. J. Burrows Dr. I. Jackson Mr. J. C. Hogg

Sat. & Sun., 21st & 22nd.

Dr. Spence Mr. Tuckwell Mr. Manning Dr. Boulton Mr. Fuller

Sat. & Sun., 28th & 29th.

Prof. Scowen Prof. Taylor Mr. J. N. Aston Mr. F. T. Evans Mr. Cope

Physician Accoucheur for November is Mr. J. Howkins.

Engagements

Addis—Kidner.—The engagement is announced between Bruce Addis and Rosemary Kidner.

Robinson Cross—The engagement is announced between James M. Robinson and Diana Cross.

TURVII.L—PENNINGTON.—The engagement is announced between Alan P. F. Turvill and Phyllis Pennington.

WINTER—NYE.—The engagement is announced between Dr. John Michael Winter and Adrienne Elisabeth Nye.

Marriage

GREEN—MINNS.—On August 15th, at Bunyan Meeting, Bedford, John William Green to Sheila Alice Minns.

Births

Branfoot.—On September 22, to Sue (née Stanbury) and Antony Branfoot, F.R.C.S., a daughter.

Goodwin.—On September 30, to Jean (née Bruce) and Dr. Stewart Goodwin, a son (Bruce William), a brother for Ruth, Caroline and Timothy.

JORY.—On September 21, to Carolyn (née Shepheard) and Dr. William Jory, a son (David William).

Deaths

Fraser, On October 2, Sir Francis Richard Fraser, in his 80th year. Qualified 1910. REYNOLDS.—On October 3, Dr. John Reynolds, M.A., L.R.C.P., M.R.C.S. Qualified 1929.

SMYTH.—On September 15, Michael Joseph Smyth, M.Ch., F.R.C.S., B.Sc., M.D., K.S.G. Qualified 1917.

WHITEHEAD.—On July 7, Frank E. Whitehead, C.B.E., M.R.C.S., L.R.C.P., aged 83. Oualified 1905.

Change of Address

Mr. A. C. Liesching to The Slipway, Westfield Park, Ryde, I.W.

Abernethian Society Programme

5th November. Humphrey Burton, Former Editor of Monitor: Television and the Arts.

12th November. Sir Zachary Cope; 'Why Study Medical History?'

19th November. Eric McGavin: 'The Evolution of the Wind Instrument'.

OBITUARY

SIR FRANCIS FRASER

Sir Francis Fraser, who succeeded the late Sir Archibald Garrod as Director of the Medical Unit of this hospital, died on 2nd October at the age of 79. He was born in Edinburgh in 1885, the youngest son of the late Sir Thomas Fraser, M.D., F.R.S., Professor of Materia Medica in the University of Edinburgh. From Edinburgh Academy he went to Christ's College, Cambridge, where he was a scholar and where he obtained first class honours in part 1 of the Natural Science Tripos. He graduated M.B., Ch.B. with honours in the University of Edinburgh in 1910 and obtained the M.D. in 1922. In 1918 he was elected a Fellow of the Royal College of Physicians of Edinburgh. After qualification he held house appointments at the Hospital for Sick Children and the Royal Infirmary, Edinburgh, and thereafter in 1912 he went to the United States to become Assistant in Medicine at the Rockefeller Institute for Medical Research, New York. Two years later he obtained the appointments of Assistant Physician at the Presbyterian Hospital, New York. and Assistant in Medicine at Columbia University. After the outbreak of World War I he returned to Europe to serve with the Harvard University Unit and later in France with the R.A.M.C. Subsequently he became Consulting Physician to the British Army of the Rhine with the rank of lieutenant-colonel.

In 1920 after returning to civilian life Fraser was appointed Assistant Director of the Medical Unit and Assistant Physician at St. Bartholomew's Hospital. At the end of the same year he became Director of the Unit and Physician to the hospital and in the following year



Sir Francis Frascr.

Photograph by Bassano, Vandyke, Elliot & Fry.

Block by Courtesy of B.M.J.

Professor of Medicine in the University of London. He was elected F.R.C.P. London in 1926. He remained at Bart's until 1934 when he was appointed the first Professor of Medicine and Director of the Medical Unit at the newly formed British Postgraduate Medical School. Hammersmith. Some months before the outbreak of the second World War he became consultant adviser to the Ministry of Health on the organisation of hospitals in wartime and in September, 1941, he was appointed Director-General of the Emergency Medical Service. For his outstanding work in this

appointment he received his knighthood in 1944 and in the following year he was admitted to Honorary Fellowship of the Royal Society of Medicine.

In 1946 Sir Francis retired from the Chair at the Postgraduate Medical School and became director of the newly constituted British Postgraduate Medical Federation, a post which he held until 1960. For some time he was a member of the Food Rationing Committee of the Ministry of Food until its dissolution in 1954. For many years he was a member of the Senate of London University and from 1947 to 1949 he was Deputy Vice-Chancellor. He served the University on numerous committees. In 1949 the University conferred on him the title of Professor Emeritus of Medicine. In the same year Edinburgh University and in 1961 London University conferred on him the honorary degree of LL.D. In 1948 he was appointed a Commander of the Order of Orange Nassau in recognition of his services to the Netherlands during the second World War.

In 1928 on the invitation of the Melbourne Permanent Committee for Postgraduate Work he delivered a series of lectures in Australia. At the Royal College of Physicians of London he delivered the Goulstonian lectures in 1927, the Croonian lectures in 1938 and the Harveian Oration in 1960. In 1933 he was Abraham Flexner lecturer at Vanderbilt University, Nashville, Tennessee, in 1946 Frederick Price lecturer at the Royal College of Physicians of Edinburgh and in 1956 Redman lecturer at McMaster University, Ontario.

From 1927 to 1946 Fraser was a member of the Editorial Board of the Quarterly Journal of Medicine, in 1928 an original member of the Pharmacopoeia Commission which he served with a gap of four years until 1945 and in 1931 a member of the Lancet Commission on Nursing. His activities on committees of the British Medical Association covered a span of many years—from 1929 to 1952.

Sir Francis Fraser had abounding energy and great organising ability, the outcome of which was the success he made of our own Medical Professorial Unit, the Medical Unit at the British Postgraduate School and the British Postgraduate Medical Federation, the latter two of which he organised and developed from their inception. Whatever he did was with enthusiasm and thoroughness. He was a gifted and stimulating teacher, presenting things in such a way as to make his pupils think for themselves. He did an enormous amount for postgraduate education so that his influence was felt not only at home but throughout the Commonwealth. At Bart's he instituted on his firm the the method of ward teaching whereby the students sat down and one subject was discussed with two or three illustrative casesin contrast to the usual practice of a complete ward round with the physician dropping a few plums here and there with no organised instruction. He employed the metric system for all drugs and advocated the use of one drug rather than the mixtures containing half a dozen constituents which it was the custom in those early days to prescribe. He never spared himself and was an inveterate reader of numerous medical journals; after each weekly staff round he would summarise and discuss for the benefit of his staff the more important papers he had read during the week. Even on his fishing holidays in his beloved Western Highlands, where he would go for two months each summer, he would read his journals. He stimulated his staff to research and was always available to discuss their problems. Moreover, he "looked after" his men, taking an interest in their plans for the future and supporting them in every way. Kindly by nature, he had great charm of manner. He was indeed a great man.

He leaves a widow and one son to whom we extend our sympathy.

A.W.S.

VOX

The Election

Who are all these three million people who voted Liberal? A lot we know were from the Celtic strongholds, where any minority has a natural appeal, but a large proportion of the remainder were probably women. As one lady put it, she fancied Mr. Grimond because although she found the three party leaders equally attractive, he alone would be likely to have enough time to pay any attention to her over the next five years.

Many people must have had similarly difficult decisions to make, not least the Conservative candidate for Cardiff South-East, who in a rash moment at the hustings vowed that cricket was nothing to him compared with politics. We must now hope that his brief political career has a happier effect in his cricket than his cricket did on his popularity at the poll.

It was a good clean fight though, apart from the lady who voted twice at Kingston-upon-Hull North, and the Sussex University students who lured the inhabitants of the public bars at Brighton Kemptown down to the polling stations by the strategic positioning of bottles of methylated spirits. And of course Smethwick. The Conservatives only narrowly resisted the temptation to indulge in a smear campaign on the morals of the Labour front bench; but it would have done them no good, just as Barry Goldwater's truth squad will do him no good. There is a Profumo in every party.

At one time the battle was so close that a rumour began to circulate that Kruschev had been released to act as locum at No. 10 until the country could make a firmer decision; but this forecast proved unduly optimistic. In the final analysis either an awful lot of people are stark staring bonkers, or Quintin Hogg himself is.

Many Tories are sitting back and saying that Mr. Wilson cannot dare, with his small majority, to attempt any of the extreme changes outlined in his manifesto; the Land Commission for example, but do they know that his house in Hampstead Garden Suburb has a 6% mortgage on it with ten years still to run?

The Olympics

This again has been very much a two-party affair. Your correspondent cannot recall the theme of the Russian national anthem (or whatever they call it), but even the impeccable etiquette of the Japanese must be put under strain by thirty-two renderings (up to the date of writing) of "The Star-spangled Banner". The emotions of the competitors have on the whole been as controlled as those of their hosts. But in the boxing one of the best punches of the Games was landed by a Spaniard on his referee, while a Korean fly-weight, whose name just happened to be Dong-Kih, registered his protest against disqualification by a sit-down strike in the middle of the ring. One lady athlete was so distraught with her own performance that she shaved off her hair as a penance for letting down her country, but (again up till the time of writing) there have been no reports of Hari-Kari.

Private Enterprise

We would like to offer our congratulations to the winner of the Hayward Prize, Mr. T. J. McElwain; nobody could have worked harder for this award.

A mother in Delaware with nineteen children recently gave birth to triplets: the father was described as being unemployed.

An exciting development by the Imperial Typewriter Company is a musical typewriter. On enquiry this is not a machine which plays the pick-of-the-pops to lighten the tedium of your business letters, but one which types musical scores. Reports suggest that there should be a sound market.

It is sad to relate after the welcome we gave to the new Forth Road Bridge last month, that it has caused appalling traffic congestion in the area, partly because of the attractive views which it affords. But wherever you are driving, mind how you go, Gilmore has got his driving licence back.

LYMPHANGIOGRAPHY IN A CASE OF BILATERAL CHYLOTHORAX DUE TO CHRONIC LYMPHATIC LEUKAEMIA

by A. P. Wyatt

This case history is reported because it illustrates a so far little used application of modern lymphangiographic technique in an uncommon disorder. Chylothorax as a presenting feature in chronic lymphatic leukaemia must be rare.

Case History:

A 56-year-old man had been in good health apart from minor respiratory infections. Both his father and brother suffered from pulmonary tuberculosis. Mass miniature radiography last done in 1959 had shown no evidence of active pulmonary disease. In May 1963 he began to notice shortness of breath and a feeling of constriction in the chest. His practitioner referred him for a chest X-ray, and he was found to have a left sided pleural effusion. He was therefore admitted to his local hospital for investigation. There he was noted to be rather thin but apart from the signs of a left-sided effusion nothing abnormal was found. The left chest was aspirated on four occasions at about weekly intervals and large quantities of up to four litres of fluid, thought to be pus, were obtained on each occasion. Streptomycin was injected into the pleural cavity. On the fourth occasion the chylous nature of the fluid removed was noted, and the patient was transferred to the care of Mr. I. M. Hill at Grove Park Hospital. Bronchoscopy was performed on 10.6.63 when unobstructed left lower lobe atelectasis was found due to the presence of pleural fluid. No other abnormality was seen. Left thoracotomy was therefore advised and this was carried out on 1.7.63. by Mr. Hill. 200cc. of lightly blood-stained chyle was found in the pleural cavity. There was minimal fibrin deposition on the lung and parietal pleura but considerable oedema of the pleura of the lower half of the chest. Fleshy lymph nodes were found overlying the oesophagus and one of these was taken for biopsy. No localised lymph leak could be found, and so a structure thought to be the thoracic duct was triply ligated and the chest was closed. The patient made an uninterrupted recovery from the operation. The lymph node biopsy was reported on as lymphosarcoma.

No further fluid accumulated in the chest post-operatively and the patient went home on 22.7.63. He remained well for a month, apart from continued weight loss and then his respiratory symptoms recurred. A chest X-ray showed a right pleural effusion, and he was admitted to St. Bartholomew's Hospital for further investigation. Examination on 19.9.63 showed a tall wasted subject who was dyspnoeic on mild exertion. Firm enlargement of the lymph nodes was found in the left supraclavicular region, both axillae and both groins. The left thoracotomy scar was well healed and air entry on this side was good but signs of a large right sided pleural effusion were present. The spleen was palpable two finger breadths below the costal margin.

Investigations included: Chest X-ray: large right and small left pleural effusions. Hæmoglobin: 98%. W.B.C. 5,400. Neuts: 18%. Lymphs: 70%. Monos: 6%, Eosinophils: 6%. Aspiration right pleura: 2.6 litres of chyle obtained, which when examined cytologically, showed large numbers of mature small lymphocytes and a smaller number of polymorphs. Sternal marrow puncture: marrow was aspirated with ease; considerable cellularity due to abnormally active granulopoicsis with a pronounced shift to the left and a marked cosinophilia; lymphocytes prominent; appearances suggestive of a leukæmoid reaction or possibly a leucosis.

On 27.9.63 right thoracoscopy was carried out under local anæsthesia. Three litres of clyle were aspirated from the pleura. The pleura appeared normal apart from some structureless nodules in the paravertebral gutter posteriorly, which were biopsied. An enlarged lymph node was also removed from the right axilla. Histologically this showed only reactive hyperplasia. The mediastinal gland, previously removed, was re-examined and again said to show lymphosarcoma. Examination of the pleural nodule showed no definitely organised tissue but consisted of tightly packed necrotic cells of rather regular appearance, many probably of lymphocytic origin.

Lymphangiography was performed on 2.10.63

St. B.H.J., November, 1964.

when 20 ml. of ultrafluide lipiodol was injected in to the lymphatics on the dorsum of the left foot, according to the method described by Dolan and Moore (1962). The pelvic nodes on the left side were well demonstrated. They were enlarged and presented the foamy appearance typical of a lymphoma. The left paraaortic nodes were involved to a lesser extent. The thoracic duct was well outlined, especially in the lateral view and reflux of lipiodol was seen into lymph nodes overlying T.9 and 10. Contrast could also be seen escaping into both pleura in the region of the cardiophrenic angles.

The diagnosis was finally considered to be that of chronic lymphatic leukæmia. Treatment with cyclophosphamide was therefore started and he was placed on a low fat diet. Under this regime the chylothorax has not increased in size and further surgical intervention may not be necessary.

Discussion:

The last major review of chylothorax in British literature was that of Ross (1961) who emphasised the variability of the course of the thoracic duct and discussed the treatment. Lymphangiography of the thoracic duct is a recent development and is likely to be of value in several ways. It may assist in the diagnosis of the causative lesion, in this case a lymphoma. The site of any obstruction and possibly the site of the fistula may be demonstrated. Finally the anatomy of the duct system in each case can be seen and should result in an increase in the success rate of surgical attack upon the duct.

In many cases of chylothorax in the past no causative lesion has been found and the condition has been labelled idiopathic. Lawrence (1961) describes two such cases both of which responded to duct ligation. Lymphangiograms might well produce useful information on the actiology of this condition as it has in lymphatic derangements in the limbs. (Taylor and Kin-

month, 1959). The value of the investigation in defining the anatomy of the thoracic lymph channels is emphasised by Dahlgren (1963). He reports a case in which lymphangiography was attempted preoperatively, but failed. Ligation of the duct was carried out but autopsy showed the presence of a large patent accessory duct. The investigation has been carried out preoperatively with success on the continent. Devil et al (1962) were able to demonstrate lymph channels in the thorax of a long-standing chylothorax but the fistula was not seen. Laumonier et al (1962) however were able to demonstrate the pleural fistula in a case of post-operative chylothorax. Examination of the opacified duct under the image intensifier may produce more consistantly reliable information.

An association between chronic lymphatic leukæmia and chylothorax is unusual but not unknown. Kutarna (1962) reports two such cases in a series of 186 cases of "chronic lymphadenosis". In one patient the chylothorax disappeared following aspiration but in the other the condition was bilateral and intractable. In neither was it the presenting feature as in this case.

Finally may one comment that an awareness of the possibility of chylothorax and careful examination of pleural aspirate will avoid delays in diagnosis.

I would like to thank Mr. I. M. Hill and Dr. R. Bodley Scott for permission to publish this case, and Dr. R. J. M. Whittle and Dr. D. C. Jackson for the lymphangiographic find-

Summary:

A case of lymphosarcoma presenting as bilateral chylothorax is described and the value of lymphangiography of the thoracic duct in the investigation and treatment of chylothorax is emphasised.

REFERENCES

Dahlgren, S. (1963): Acta Chir. Scand., 125, 201. Devil, R., Prech, H., Morin, P., Faudon, J. (1962): Amer. J. Roentgenol., 88, 110. Kittarna, A. (1962): Neoplasma (Bratisl.), 9, 3. Laumonier, P., Lachapele, C., Courand, I., Hughes,

A., LAGARD, C., MAGE, J. (1962): Press Med., 70, 2630.

LAWRENCE, K. (1961): Brit. J. Surg., 48, 653. ROSS. J. K. (1961): Thorax, 16, 12.

Taylor, G. W., Kinmonth, J. B. (1959): Recent Advances in Surgery, p. 132, ed.: Selwyn Taylor.

J. & A. Churchill, London.

DR. RODERIGO LOPEZ

By A. GRIFFITH

In his short life Adrian Griffith left his mark on the world and on Bart's. Wit, wildfowler, and wine-lover, he showed great promise as an E.N.T. surgeon and research worker, founded the Junior Osler Club in 1952, and edited the Bart's Journal in the year of the Festival of Britain, 1951. He died in October 1961 at the age of 33. In 1952 Griffith won the Wix Prize essay with a distinguished treatise on Roderigo Lopez, a Portuguese doctor who in 1568 was the first House Physician to be appointed at Bart's-and who, after being caught up in the life of intrigue and corruption in Elizabethan politics, was executed for treason at Tyburn thirty years later. The following are two extracts from this essay, which relate, firstly. to Lopez at Bart's and second, to mention of him in the drama of his day. -S.P.L.

St. Bartholomew's Hospital was refounded in 1544 under the patronage of Henry VIII, various posts were made and their duties were appointed. Though three surgeons were given posts no physician was included. It was thought either to be unnecessary, or too great an expense. However, shortly after 1561, the position of House Physician was created. The duties of the holder were to look after the poor and sick of the Hospital. He was to be given a house, together with a small garden, which was his real emolument; his living being made by private practice. If the house occupied by the first physician was the same as that of his successor, Dr. Timothy Bright, it was near St. Bartholomew's Close, "the garden abutting to Christ's Hospital within a stone's throw of the gate of St. Bartholomew's in Little Britain". He was also given an allowance for billets and coals, and a salary of 40s. a year.

Dr. Roderigo Lopez was the first to occupy this newly created position of House Physician, though he was not appointed at once. He is first mentioned in the Hospital Journal on June 19th, 1568, though he had probably been in occupation a short time before. Throughout the fifteen years that Lopez worked for the Hospital there is little record of him except in the Journal. It is unfortunate that almost all account of the man must be gleaned from the single source of the Hospital financial reports. It is most unfair to judge any man wholely from his accounts, or the differences between himself and the Hospital.

On June 19th, 1568, "it was ordered by the courte that Mr. Doctor lopus hall shalbe boarded with deleboard or otherwise". Apparently this order was not carried out for in March the following year the order was repeated "at the speciall and earnest request of Mr. Doctor Lopus the said Mr. Doctor's hall shalbe borded this somer."

In an entry of January 22nd 1575, there is an order "out of the storehouse one C1 of pale boarde towards the repayring and amendying of the payle in his garden, he paying for the workmanship thereof."

Some years after the hall was panelled, his parlour too was made as comfortable. On November 5th 1575, there is this record:

"Mr. Docter Lopus. This day order is taken by the Courte that Mr. Docter Lopus parlour shalbe borded forthwith in consideration that he shalbe the more paynful in lookinge to the poore of the hispital."

And on October 3rd 1517, "Mr. Docter Lopus, his house shall be amynded in tyllinge when it is needful."

In May 1579, he made suit that he might let his house to another man because he wished to move further into the middle of the city, "where better eyre is". This request was granted, and he was allowed to let it to a citizen, lawyer, or physician, and might retain his allowance as before "he doinge his dewtye to the poore twyse everye weke wekly or by his deputye to the lykinge of the masters & gouernors of this house." It seems that despite his letting his house to another, he was able to return there and stay from time to

The clinical experience that Lopez had in the hospital would have been very varied. We have no record of any of his cases left to us now, but it is likely that he would have to look after all the medical patients, as he was the only physician. At this time St. Bartholomew's Hospital was not unlike a hospice, serving the double office of hospital and infirmary. Robert Copland, a printer of the 16th Century records an imaginary conversation in verse between himself and the gate keeper, called "The Hyeway to the Spyttel House." 172

After a few brief remarks about the weather, Copland asks who is admitted to the Hospital. The porter replies:

"Forsoth they that be at such myschef That for their lyving can do no labour, They have no friends to do them socour, As old people, seke and impotent, Poore women in childbed here have easement.

Weke men sore wounded by great vyolence.

And sore men eaten with the pockes and
pestylence

And honest folk fallen in great poverty By myschance or other infirmity. Wayfaring men, and maimed soldyours Here theyre relief in thys poore hous of And all others which we seme good and playne

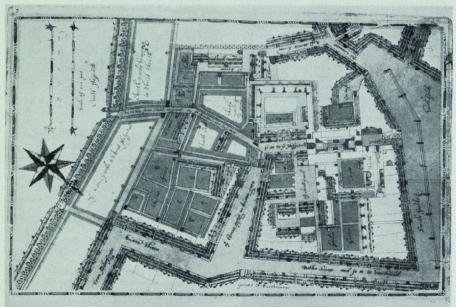
Here have lodging for a nyght or twayne.

"But not every unseke and stoborne knave For them we should over many have."

The pockes and pestylence that the poet refers to were in fact very real. William Clowes records "It hapneth in the House of St. Bartholomew's very seldom but that among every twentye diseased of person that are taken in, fiftene of them have the pocks."

On June 3rd 1581, Lopez ceased work at St. Bartholomew's Hospital. Dr. Peter Turner, who had been trying to get on to the staff of the Hospital for six months, took over the post of House Physician.

From the Journal it seems that Lopez would not vacate his house, and an acrimonious dispute is recorded in its pages. First an order was made that "Docter Lopus, now departed from the service of the poore, he be warned to avoide the house befor mydsomer (June 21st) or St. Jamestide next comming at the furthest."



PLAN OF THE HOSPITAL IN 161' from the Reportery Book

which fell a month later. He was then told to be out by Michelmas next (September 29), and by February 3rd the following year, 1582, he had left.

This concluded Lopez' association with St. Bartholomew's Hospital. It has been claimed from these entries that Lopez was a man "in every way unworthy of so important a trust, a man neglectful of duty and devoid of principle". This judgment seems very harsh, especially in view of the single source of the evidence. Dr. Roderigo Lopez gave fifteen years of his life to the Hospital. Dr. Peter Turner, his immediate successor, resigned after only four years and Dr. Timothy Bright, the next physician to the Hospital, and incidentally the inventor of the first form of shorthand, also left after only a year or two.

It is kinder perhaps to conclude the account of Lopez' stay at the Hospital with the only direct evidence we have of his clinical ability, happily complimentary. It is given by William Clowes, a famous Elizabethan surgeon, who had attended Leicester's army where he had acquired great skill and experience in dealing with gunshot wounds. He returned as a consultant to St. Bartholomew's Hospital.

By William Clowes when writing to the "young practizers of Chirugies" in his book "A Prooved Practice", he relates the cure of one of his patients, after advice given by Lopez.

"The cure of Mr. Alexander Fones, a Marchant of London, who being in a ship at Sea was set upon by the Flushingers, in which fight he was very dangerously wounded with Gunshot.

"Sore opposed for a long time whilst fighting it out, he was shot in the upper part of the breast neere the Os foruncular of the channel bone, and so passed through until it came to the lower part of the Os fcapular or the shoulder blade. Whereas two of the Chirugians of the Prince of Orange had failed at Mr. Fones great expense. He visited William Clowes when without tariance in the presence of divers skillful Chirugians of London make incision, and there I did take out the shot."

and there I did take out the shot.

Clowes felt that the wound was not without danger and called in Dr. Lopez, "one of her Majestics Phisitions which afterward showed himself to be both careful and very skillful, not for his council in dyeting, purging and bleeding but also for his direction of Arcus Apozema, amongst others. It wrought the

most singularily: the power thereof, I have never had until that time, but since I have used it, and I have found it a treasure for the curing of wounds."

After giving directions how to make it up, Clowes concludes "With these remedies, I did perfectly make whole and cicatrized up the wound, as so he remanyneth unto this day, within this citie of London."

The allusions to Lopez in contemporary Drama are most interesting. For as many as thirty years after his execution for treason his name was remembered, and good enough for a laugh. Playgoing was a popular pastime in Elizabethan England. Lopez supplied Shakespere with his greatest villain. Only a few weeks after the execution, Burbage at the first performance of the Merchant of Venice, brought more than a hint of Lopez into his Shylock at the Blackfriars Theatre. Later in 1598, Alleyn was playing Dr. Faustus in Hanslow's rival theatre, The Fortune, Cripplegate. In this play a horse courser, dripping wet after a ducking, shouts "Alas, alas, Docter Faustian, quoth a mass? Docter Lopus was neuer such a docter that gives me a purgation, hath purged me of more than forty dollars": this passage must have been interpolated some years after Marlow's death.

Theatregoers were still familiar with Lopez in 1624, when Thomas Middleton in "A game of chess" puts into the mouth of one of his characters the following words, "Promised also to Docter Lopez for poysoning the Myden Queen of the white kingdom, ducketts twenty thousand."

There are allusions to Lopez in Thomas Dekker's "Whore of Babylon", which was performed in 1607, and also in "England's Joy, a Spectacle" (1602).

John Taylor, known as "the Water Poet", a riverman and one of the most curious of lesser Elizabethan characters wrote:

"Lopez, a doctor, by descent a Jew, A Portingale by birth, the Queen's physition Forgetting duty to his sovereign due Would poison her to further Spain's

Ambition."

In a book also published at this time, "Illustrations from Popish Plots and Treasons, from the beginning of the reign of Queen Elizabeth, illustrated with Emblems and illustrated in verse", there is a line engraving (the thirteenth print), of "Lopez compounding to

poison the Queen": this also appears in George Carleton's "Thankful Remembrance of God's Mercy". It shows a man wearing a Spanish ruff and a broad bever hat, standing in a landscape of gibbet and churches: he is speaking to a man in more academic costume, presumably Lopez, from whose mouth proceeds an ornamental scroll containing the sinister words, "Quid dabitis".

In the "Illustrations from Popish Plots" it is subscribed by this verse:

But now a horrid Treason View Hatcht by the Pope, the Devil, and a Jew: Lopez a Doctor by Poison do What all their Plots have failed in

hitherto.

What will you give me then, the Judas

Full fifty thousant Crown, t'other replies Tis done—but hold, this wretch shall miss his hope

The Treason's known and his Reward the Rope.

Such may be discovered of the life of Dr. Roderigo Lopez by stirring up the waters of the past. But what is left of him today? A paragraph in our history books, a few mentions hidden from one year to the next in the reading room of the British Museum and some yellowing sheets in the Public Record Office. In this Hospital, in which he was made the first of a distinguished line of physicians, Lopez is remembered with an embarrassed shrug of

the shoulders, with his only memorial the entries in the Hospital Journal. He has left us no works, nothing by which we can remember him but the Arcus Apozema, which appeared to be most efficacious to William Clowes for "It wrought most singularly". The medicine did not, however, become popular and is not present in the First Hospital formulary compiled in 1670 by Dr. Edward Browne, a century later.

Happily it is preserved for us by that most meticulous of observers. William Clowes, in his hand-book "A Prooved Practice". It is given in its entirety:

Rec Hordei mundat contusi Passularum mundatorum conusarum

ana p iiii Rec Hordei mundat contusi ana p iii Gliceryzæ contusæ ij Iuiubarum numero xx Pronorum numero xv

Radicum petrocelini contu mj All which being boyled in riiii pound of Rayne sater, to the consumption of the third part. After that let it be strongly strayned wherunto shall be added:

Penediarum iii

Sirupi Rosarum & deduabus) radicibus sine aceto

Saccari albi lib fs Cinamoni puluerizati Fiat Apozema.

AROUND AND ABOUT:

7 - Southwark

SOUTHWARK, along with Westminster, can claim to be the oldest of London's suburbs. vet it has a more intimately London atmosphere than any of the surrounding boroughs. All that most Londoners see of it as they hurry homeward bound are the tall frowning warehouses and the solid soot blackened railway arches that echo with the roar of the ever passing trains. Yet some relics of the old Southwark remain hidden away in odd corners where few would think of looking

Southwark owed its development to its position at the focal point at which the roads from

the south of England converged before crossing the river at London Bridge which remained the only bridge across the Thames until the middle of the 18th century. As might be expected from its position it abounded with inns but these were not its only speciality. It contained in its small area an amazing number of theatres, religious houses, palaces of church dignitaries and no less than seven prisons. None of these buildings unfortunately survive except the priory of St. Mary Overie or Southwark Cathedral. The priory was founded in 1106 but the church itself dates from the 13th

century, or rather some of it does for Southwark Cathedral is remarkable for the number of rebuildings, alterations and additions it has undergone over the years. The interior is well worth studying for all the odd details of different periods that can be discovered.

There are two Southwarks with distinct characters, the Thames-side Southwark and the remainder. Thames-side Southwark is dominated by the huge warehouses but a few interesting buildings remain. Threading one's way through Cathedral Street and St. Mary Overie's Dock, Clink Street is reached. On the left is Winchester Square, once the courtyard of the Bishop of Winchester's palace, destroyed by fire in 1814. Clink Street is named after the prison that was under the bishop's jurisdiction and leads into Bankside. Bankside was a great centre for entertainment in Elizabethan times, and was filled with theatres, wrestling grounds, bear gardens and brothels. Now only the names of the streets and alleys leading off the wharves remain as a reminder of the past. A happy survival however is the Anchor Inn, an early 18th century building that capitalises on its connections with Dr. Johnson. The view from this pub across the river at sunset is magnificent, with the twin towers of Cannon Street Station, stark now without their linking overhead roof, standing out against the sky. Further along Bankside past Rose Alley, named after the first Bankside theatre which stood on this site, and the Bear Gardens where bear baiting took place, Cardinal's Cap Alley is reached. Here three surviving houses of the 17th and early 18th century stand. One of these, Cardinal's House, was where Sir Christopher Wren lived during the construction of St. Paul's, being rowed across the river each day to supervise construction. In an earlier house on the site. Henry VIII's first wife

Catherine of Aragon waited to receive her husband on her arrival in England. Looking across the river to St. Paul's one can only imagine what the view of the City spires must have been like before the Thames Street warehouses were built. It seems a pity that in London commerce must always take precedence over town planning. At the end of Bankside is Hopton Street. Here overshadowed by the ugly Bankside power station are the Hopton Almshouses, a charming group of two storied brick cottages of 1752

arranged around a green.

Returning via Sumner Street and Park Street, Barclay's Anchor brewery is reached, the oldest part of the building dating from 1832. A one time proprietor of the brewery was Dr. Johnson's friend Thrale. On Thrale's death Johnson was appointed one of his executors and being asked the value of the brewery which was being put up for sale remarked, "We are not here to sell a parcel of boilers and vats, but the potentiality of growing rich beyond the dreams of avarice". Brewing then as now gave a good return on investment. In Park Street too, is the tablet marking the site of the Globe theatre, Shakespeare's famous "Wooden O" which was demolished by the Puritans in 1644. At the end of Park Street is a curious little early 19th century residential area by Red Cross Street.

On the other side of Southwark High Street is St. Thomas's Street; and here is all that remains of the old St. Thomas's Hospital which stood on this site until 1868—the Chapel, now the Chapter House of Southwark Cathedral. The building dates from 1702 and is in typical 18th century classical style. It is well worth visiting because one of the rooms has been converted to the facsimile of an operating theatre of the last century complete with contemporary surgical instruments. Beyond the chapel is a fine terrace of Early 18th century houses (Nos. 11-15 are plainer and of later date). At the end of the street on the opposite side is Guy's Hospital. Thomas Guy was a wharfinger's son and a native of Southwark who amassed a huge fortune mainly by speculation in, among other things, South Sea stock. He founded his hospital opposite St. Thomas's, of which he was a governor, to relieve overcrowding in the older hospital, but died in 1724 before building was complete. The hospital was badly damaged in the war but restoration is now nearly finished. The older part of the building consists of a fine central block with projecting wings enclosing a courtyard. The style of construction rather resembles our Gibb buildings at Bart's, but with pediments and columns. In the centre of the court yard, at present boarded up, is a fine statue of the founder. Keats was a medical student at Guy's from 1814-1816 and like all medical students found lectures a drag. Once he records, into the lecture room, "there came a sunbeam and with it a whole troop of creatures floating in the ray; and I was off with them to Oberon and fairyland".

Back in the High Street a few doors down on the left is King's Head Yard. The pub of that name, haunt of Guy's students, dates from 1881 and replaces a much older Inn on the same site. The carved head of Henry VIII over the door dates from the late 17th century. The only Southwark Inn to remain in its original state is the George in George Yard. Only the South wing still stands; the other two sides were demolished in 1889. The George replaced an older building burnt down in 1676 and is of the galleried design typical of the period and which figures prominently in the 18th and 19th century literature. The bedrooms open direct onto the galleries and the coffee room retains

its old fashioned pens.

On the opposite side of the road is No. 50, at present undergoing reconstruction. Its yard contains the only remaining half timbered house with oversailing upper floor in Southwark. A hundred yards further down on the left at Tabard Street is the churchyard of St. George's. On the wall on the left hand side of the garden are tablets referring to the Marshalsea prison. Dicken's father was imprisoned here for debt for three months in 1824, and Dickens incorporated his experiences of the prison into his novel "Little Dorrit". The Marshalsea ceased to be used as a prison in 1842, and little now remains of it. Little Dorrit's garret is supposed to be on the extreme left of the church yard as you face the inscription (Behind No. 211 Borough High Street).

A table tomb at the entrance to the Churchyard has an interesting epitaph. The lines are

derived from Pope:

How lov'd, how valued once, avails thee not To whom related, and by whom forgot; A heap of dust alone remains of thee; 'Tis all thou art, and all the proud shall be. Saint George's Parish Church, at present being restored, was completed in 1736 and replaced a medieval building on the same side. A sturdy simple piece of classical architecture it is well sited and appears to advantage from either north or south. The interior is not particularly inspiring but contains a fine carved pulpit. The church is chiefly remembered for its Dickensian associations, for it was here "Little Dorrit" was baptised and married and sought refuge one night when locked out of the prison.

At the bottom of the High Street, Trinity Street leads to Trinity Square, an early 19th century square recently restored. The church, now disused, is of 1823 but the most interesting feature is a greater than life size statue of Alfred the Great, brought from the Palace of Westminster in 1822. It appears to be of the late 14th century and is said to be London's oldest outdoor statue.

Like many a London borough Southwark is a typical hotch-potch and jumble of buildings, many seedy and dilapidated and hardly worth a second glance. Yet it has a peculiar atmosphere of its own. You feel it down by the river at Bankside where the cavernous blackwalls of the warehouses are silhouetted sharply against the setting sun and the grey river rushes coldly by. You feel it too as you walk past the decayed Georgian Terraces of Union Street or Stamford Street. It is part of the never ending attraction of London.

A HISTORY OF STETHOSCOPES

Hippocrates listened to pleural rubs and succussion splashes with his unaided ear, and others after him heard the faint traces of heart murmurs, but the invention of the stethoscope opened up a whole new dimension in physical diagnosis. It all started in 1816 when René Laënnec was a physician at the Necker Hospital in Paris Faced one day with a patient whose dimensions, sex, and impressionable age rendered the direct application of ear to chest both difficult and indelicate, he picked up a sheet of paper, rolled it into a cylinder, and found that what he had thought to be a sacrifice to propriety was in fact a great improvement on the old method.

It was not long before Laënnee, having experimented with paper, metal, glass, and

beaten skin, selected wood as the most suitable material. His stethoscope, which he made himself, was a hollow cylinder 13" long, very similar to that shown in Fig. 2. It was constructed in two pieces with a screw connection so that each half could be carried in a tail pocket or inside a top-hat.

Although Laënnec's original design was widely copied at first, people soon found that they could hear as much with one half of the stethoscope as with the two pieces joined together. By 1830 therefore, shorter instruments were being made, and at the same time the bulk was reduced by carving away the wood in the central part of the cylinder, so that chest-piece and ear-piece became connected by a narrow stem.





Fig. 1. A sketch of Laënnec made by C. J. B. Williams, who was his pupil in Paris in 1825.

One of the earliest records of a stethoscope in this country is in 1817, when only a year after its invention a certain Dr. A. B. Granville who had a practice in Savile Row brought one back from France. But it was William Stokes (of Cheyne and Adams fame) who in 1825 wrote his *Introduction to the Use of the Stethoscope*, and thereby was chiefly responsible for bringing mediate auscultation to England. Stethoscopes were first used at Bart's

The next important alteration in design was the replacement of the rigid tube joining chest-piece to ear-piece by a flexible one. This change was not an attempt to improve the acoustic efficiency of the instrument, but seems to have been designed to allow the physician to remain at a safer distance from his patient from the point of view of contagion. Although the

flexible stethoscope was hailed as a 'new invention' by *The Lancet* in 1875, this announcement stimulated a correspondence which showed that similar instruments had been in use, albeit sporadically, since about 1830.

It is also difficult to trace the exact timing of the important transition from monaural to binaural stethoscopes. The latter were considered enough of a novelty in 1851 for an example to be displayed at the Great Exhibition; but C. T. Williams, (the son of the C. J. B. Williams whose sketch of Laennec is shown in Fig. 1.), claims that his father had made a binaural stethoscope consisting of a mahogany chest-piece with bent lead tubing for ear-pieces back in 1829. It seems clear however that binaural auscultation was not commonly practised until Dr. Camman of New York produced his more manageable instrument in 1852—and even then monaural stethoscopes predominated in this country until as late as

Not even stethoscopes could escape the feverish elaboration of the Victorians. There were multiple stethoscopes enabling the whole firm to listen simultaneously; stethoscopes with water-filled rubber bags for chest-pieces, and most remarkable of all, the Aydon-Smith model which could be used as a monaural or a binaural stethoscope, an otoscope, an enema or oesophageal tube, a tourniquet, or a catheter. Scott Allison also produced a differential stethoscope with two chest-pieces, designed to enable more accurate localisation and timing of sounds—an innovation which survived rather longer than his hydrophone.

But the only important advance during this period came in 1894 when Bassi and Bianchi announced their phonendoscope. Although their claims about the applications of this instrument were somewhat extravagant, (auscultation of the eyes was listed as one of its leading advantages), it proved to be the progenitor of the modern diaphragm chest-piece, which to-day is considered essential for the appreciation of the higher frequency sounds such as the murmur of aortic incompetence. The diaphragmbell combination chest-piece as we know it was first incorporated in the Sprague-Bowles design of 1926.

Apart from recent efforts, discussed in last month's Journal, to improve the acoustic efficiety of stethoscopes by attention to detail, the only major departure during the last forty years has been the introduction of electronic amplification. Suggested applications for these

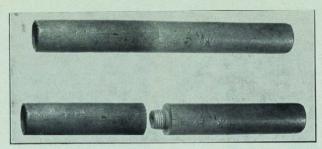


Fig. 2. The first stethoscope used at Bart's (1827).

instruments range from routine use in noisy paediatric wards to veterinary diagnosis, (with a warning that use on pigs may not only be unrewarding but even dangerous). Probably their only value however, lies in assisting deaf practitioners, though they may prove of use with foetal heart sounds and with auscultation of joints. From the point of view of greater analysis of heart sounds and murmurs they have been supplanted by phonocardiography.

The danger of course to-day is to exaggerate the value of auscultation and to forget that inspection, palpation and percussion (which incidentally was introduced by Auenbrugger only fifty years before Laënnec's discovery), will often make it possible to predict what the

patient will sound like, before the stethoscope has even left the pocket. But rather than blame Laënnec for leading us away from the more basic signs of disease, we should remember that he was a great and balanced physician even before his discovery, and that long after his link with auscultation has been forgotten, his name will be associated with a hob-nail liver.

Acknowledgement

This account was largely drawn from references and material which have been amassed by Mr. Thornton, and the Journal would like to thank him both for his generosity with this information and for his help with the recent exhibition of stethoscopes in the library.

THE DAY KUT FELL

by Col. W. C. Spackman

The following is an extract from Col. Spackman's book to be published shortly, Col. Spackman, an old Bart's man, was in the Indian Army.

The 29th April, 1916, broke calm and sunny, with a light cool breeze. Under happier circumstances it might have been a day to rejoice the heart, for Mesopotamia on Tigris bank can be a pleasant land indeed. We were young in spirit, but for us it was a day of heartbreak.

We had come to the literal scrapings of our siege rations, which had been constantly reduced almost to vanishing point. We had been besieged for five months and although in our regimental lines we had quite a number of fairly fit, but thin, sepoys, the garrison could

undertake nothing more than defensive duties.

Down in the battered town, the picture in the Hospitals was appalling. The weather by day was now very hot and on entering the town you were met by a sickening stench. Sanitation had never been started, and the normal open spaces for such needs not being available, filth accumulated and rotted everywhere. Dysentery, fever, anæmia and T.B. were carrying off 20 men a day, men already weakened by starvation, malaria, scurvy and beri-beri, their gums oozing pus, their cheeks sunken, with every rib

visible and their legs and feet mis-shapen with dropsy and without even the spirit to beat off the flies which swarmed upon them. It was a pitiful sight to see previously robust and cheerful men reduced to such misery and distress, and too often with a resigned look of despair in their eyes. It was heartrending for the devoted medical staff to feel we were helpless and inevitably losing our own special battle.

St. B.H.J., November, 1964.

Never shall I forget that morning of surrender. It must live vividly in the memory of each one of us who was there. First, everyone was issued from the Field Treasure Chest with a small sum in gold and rupees. After that we spent some hours in the mclancholy task of destruction. Wherever you looked you saw columns of smoke rising into the clear sky as piles of saddlery, broken mule carts and every variety of equipment burnt away briskly, the flames fed with fodder, matting, empty boxes and surplus firewood. Ammunition and rifle bolts were dumped in the river, rifles smashed except for a small number kept as protection against possible Arab miscreants within the town.

The whole plain resounded with the peculiar sharp metallic explosions made by blowing up all the guns. Poor gunners! Some of them were in tears as the guns they had served and tended so long and so well were filled with gun cotton and blown to pieces. I was particularly sorry for the Volunteer Battery, manned by Eurasians from India, such a gallant band and so devoted to the 'motherland' they had never seen. This battery, the Buchanans, was nicknamed after a brand of whisky, the Black and White Battery, a punning but quite affectionate nickname.

Soon after mid-day we saw the Turkish column marching in along the loop of the river by the Fort, and we stood at our bivouacs while detachments came to take charge of each unit, guided by our own people. They were swarthy, stocky Anatolian types we came to

know so well later, wearing the cloth folding headgear called the enveriya after Enver Pasha who introduced it at the time of the Balkan Wars. They seemed rather embarrassed by their position but were well behaved. One or two instances of isolated robbery in the town were promptly and severely dealt with when complaint was made to a Turkish officer. The officers were easily distinguished by wearing epaulettes and having their enveriyas made of a superior kind of cloth. They carried short swords and automatic pistols. Staff officers were an upright cap of astrachan, the kalpak, with radiating stripes of gold or silver braid across the cloth crown.

The senior Turkish officer who took our surrender was extremely angry at the blowing up of the guns the capture of which in those days carried a loss of prestige. As a matter of fact all our guns were pretty well worn out, in addition to which the Turks would have had great difficulty in finding ammunition for them. A number of the guns were in fact quite ob-

The Turks soon took their revenge by promptly hanging the Sheikh of Kut in the market place together with several others of the inhabitants who could have been considered as having helped us. Others got a severe beating-up and all had their goods confiscated.

My diary records: "29th April. We blew up our 40 guns today and burnt everything of any military value. I fired my revolver into my beautiful binoculars, then smashed the revolver with a sledge-hammer and burnt my saddlery . . . we are now all camped along the river's edge and Turkish river boats have come to take up boat loads all night to their main camp up river."

And so ended the long weary Siege of 146 days. Kut had fallen. But "Vae Victis"! We hardly realised what still lay ahead and how few would survive the next two and a half years in captivity.

The Christmas Card, 1964

Christmas Card Order Form.	Please use BLOCK CAPITALS
NAME:	No. of cards required
ADDRESS:	Cost at 4s. per doz£ s. d.
	Plus postage, 1st doz. 9d.
	additional doz. 4½d. (Orders over 5 doz., post free)
	Total £ s. d.
Please enclose remittance with order, addressed to Th London, E.C.1. Cheques and P.O.'s payable to St.	ne Manager, The Journal, St. Bartholomew's Hospital, Bartholomew's Hospital Journal.

ANNUAL REPORT OF THE CHAIRMAN OF THE STUDENTS' UNION

Introduction

The Students' Union year ends in mid-November and at this point it is my duty to

report on the year's activities.

The present Union Council took office on November 14th, 1963. The previous year had been a time of great expansion under the vigorous and able chairmanship of Trevor Powles. It had been a year in which the foundations for an enriched and influential structure had been laid. When I took office I think that we all felt it was our job to see that the seeds that had been sown, bore fruit.

Union Committees

(i) The Journal: During 1963 the Journal had been greatly improved and had become, by any standards, a quality magazine. These improvements resulted in an increase in costs and the net result was that the Journal had lost £500 in the financial year.

Since the Journal is owned by the S.U., the Union was responsible for covering this loss and did so, but it was quite apparent that this trend could not continue. There were two alternative solutions. Either the Journal could lower its standard or it could continue to make a loss and look for subsidies. We agreed that the official organ of the Hospital should not sacrifice quality to profit and subsidies were

looked for.

The Hospital authorities were approached and agreed to grant the Journal £200 a year and also to purchase 40 Journals a month for distribution to Hospital employees. This move, along with the re-organisation of the Journal's Financial Department and a closer liaison between the Union and the Publications Committee, has resulted in a large improvement in the Journal's financial position and if the trend continues the Journal should be making a profit next year.

We should like to thank Dr. Harris and Mr. Gooddy for their help in this matter and the Publications Committee for its tolerance of what may have first appeared as a challenge by the

Union to its autonomy.

I think that it should be stated here that the

Union is only financially responsible for the Journal and cannot interfere in any way with its Editorial policy.

(ii) Clubs Union Committee: The formation of the Clubs Union required a change in the Constitution and this was agreed at the 1963 Annual General Meeting. The Clubs Union has now completed its first year and has been most successful and far less cumbersome than the old Athletics and General Committees.

(iii) Honours Colours Committee: The Honours Colours Committee arose as an offshoot of the Clubs Union, since it was believed that the award of Honours Colours should be in the hands of a predominantly permanent committee. It has met once this year. At this meeting it was decided to examine the possibility of providing some token for the women students who were awarded Honours Colours, which was equivalent to the tie awarded to the men. A brooch or pin has been suggested and enquiries are being made about the possibility of producing this.

(iv) Wine Committee: This year's Chairman, Mark Whittaker, must be congratulated on the great success of the Wine Committee in 1964. A report of its activities will be

found separately in this Journal.

The constitution of the Wine Committee was changed to permit the Union to apply for a club licence for West Smithfield and at the time of writing (6th October) this application is before the City Licensing Justices.

The Union Constitution was amended to allow excess profit of the Wine Committee to be paid into the Capital Equipment Fund of

the Union.

(v) Teaching Committee: The Committee completed its first full year. Its suggestions were accepted by the Professors of Bacteriology and Pathology and some of these have been incorporated into the improved course; it is now possible for final year students to take Conjoint Pathology after 24 months clinical

The College agreed that the Conjoint Midwifery may be taken 27 months after becoming

a clinical student.

Preclinical teaching was discussed and the Committee's reports were well received.

I feel that the Teaching Committee has proved valuable and suggestions have been well received by the Heads of those Departments approached.

Abernethian Room

We finally moved into the new Abernethian Room on August 20th. Despite some grumbling from the traditionalists and the sleepers, it has been generally agreed that the new accommodation is better than the old. Among the things we have gained are an extra lounge, a patio, a bathroom for the ladies and a billiard table (the gift of an anonymous donor) which has proved tremendously popular.

It is impossible to mention all the people who have helped us over the planning of the new room but in particular I should like to thank the Hospital administration for their unfailing courtesy and consideration and the Dean and Mr. Morris for all the hard work that they put in on our behalf. The helpfulness of everybody concerned is some measure of the excellent relations that exist between the S.U. and the Hospital and College.

One point, however, remains to be settled. This is the name of the new women's Common Room. The women students met together and decided that they wanted the room called THE ELIZABETH BLACKWELL ROOM and this suggestion has been turned down by the Executive Committee; the Union feels that it must pursue this matter further and is doing so.

Honorary Members

Dr. Hermann Lehmann, who left us this year for Cambridge, was elected an Honorary Member of the S.U. in gratitude for all he had done for student affairs in the College. Dr. Lehmann was kind enough to donate a mantel clock for the Reading Room of the new Abernethian Rooms

Sweepstake

The pre-war tradition of a sweepstake on the Grand National was revived this year. There was a very good response from the Hospital and prizes totalling £99 were awarded. A small profit was made which went into Union funds. In view of its success, it will be repeated next year.

Car Parking

The problem of car parking was once again raised when the number of spaces for cars in front of College Hall was reduced. The Union immediately approached the car parking authorities and we have a firm guarantee that

commuting students with cars will always receive consideration whenever changes are made.

Student Selection

The Dean once again was kind enough to invite members of the S.U. and constituent clubs to sit on the interviewing board for new students. This gives students an opportunity of talking to the interviewees and helping to find out their interests and activities.

Although some members of the student body are not in favour of this idea, I think that the majority welcome it and are conscious of the honour that is done to them by the Dean.

Sports Day

This year as last year, a special Committee was set up to organise Sports Day. We were luckier than last year since the weather was magnificent and those students who attended this event and participated, enjoyed themselves greatly. However, the attendance was extremely poor when it is realised that a free afternoon was set aside for this event and I feel it is not unreasonable to hope that more students will make an effort to attend Sports Day next year.

The Queen Mother's Visit

On April 28th, Her Majesty, The Queen Mother, Chancellor of the University of London, visited the Medical College and officially opened the new buildings. The Dean entrusted the organisation of the student side of this event to the S.U., which was responsible for providing ushers and marshals and for allocating seats to students. We appreciate the way in which the college authorities made sure that every student was able to participate in the visit and I know that each of us will remember the day as a very happy occasion.

Freshmen

The Union again produced a guide-book for the Freshmen and saw that they were conducted round the Medical College and were introduced to the representatives of the clubs and societies. **Pot-Pourri**

The Council changed the structure of the Pot-Pourri Committee to provide for a greater student representation upon it. It also recommended that there should be a matinee performance as well as the three evening performances, since it was felt that many people who wanted to see the shows, were prevented from doing so because there were more applications for tickets than could be satisfied. This Christmas, therefore, there will be four performances of the Pot-Pourri and this will become a firm policy for the future if it is successful this year.

Equipment and Amenities

The Council purchased new equipment for the Gymnasium and a bar billiards table for the Pavilion at Chislehurst.

Club Grants

This year most of the constituent clubs had their grants raised. I think that the time has come to point out that this is a state of affairs which cannot continue unless the Union income is raised and therefore in the future it may be necessary to ask the College to raise the Union subscription.

Two new societies, the Badminton Club and the Music Society, were adopted as constituent clubs of the S.U.

Constitution

The large number of constitutional changes

made last year and this year, made it necessary to reprint the Constitution and revised copies are now available in all the cloakrooms.

Generally speaking this year has been very successful. Our relations with the Dean, Sub-Dean, Medical College Secretary, Clerk to the Governors and other authorities have been extremely good and has shown that most things can be achieved in an atmosphere of amity and co-operation. I should like particularly to thank our retiring President, Professor Taylor, and the Senior Treasurers of the Union, also my fellow officers of the Union Council, whose enthusiasm and hard work have made any success this year possible.

T. J. McElwain,

Chairman 1963/4.

WINE COMMITTEE CHAIRMAN'S REPORT

The newly-elected Committee took office in November of last year and Dr. George Ellis again kindly consented to become our President. Early in the year several meetings were held, and as a result an amendment was made in the Constitution of the Students' Union with reference to the disposal of any profit made by the Wine Committee. The Treasurer suggested several ways in which the running of the Bar and the keeping of the accounts could be simplified, and these proposals have been adopted. The cash turnover in the Bar of last year has been well maintained but a change in the pattern of trade has been noted: sales over the counter in the evenings have decreased somewhat while the off-sales have increased. This is thought to be due to the great popularity of our local public-house under its new landlord, on the one hand, and our off-sales service on the other. We provide liquor, glasses, and advice at short notice, and at competitive prices. Our brewers, Whitbreads, greatly help us in this by providing excellent ordering facilities and very prompt deliveries. We have provided efficient bars at the fortnightly Club dances during the Autumn, and at the Balls held by the major Clubs.

The Annual Smoking Concert was held in October and the main difference from that of last year was that the entertainment was mainly

provided by Bart's men themselves. The Cambridge Footlights gave the third part of the evening's entertainment in their customary highly professional manner.

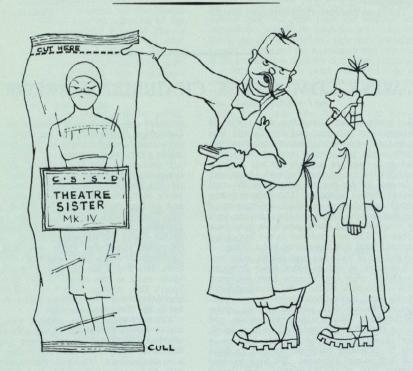
It was noted that the standard of sobriety declined during the course of the evening, and this has been partly attributed to the steaming bowls of Punch which figured so prominently and so fragrantly in the Abernethian Room. The Concert was attended by two hundred gentlemen, this small number being necessitated by the size of the Recreation Room. A most successful Pot-Pourri Party was held after Christmas to which the Committee contributed three bars and a fair quantity of punch, once again made to the recipe of Dr. Ellis. On Sport's Day, sausages were barbecued and free beer provided to cover that arid time when the bar in the Clubhouse was shut.

The next event in the calendar was a daytrip to France to visit the champagne chateau of Moet Chandon. Numbers were sadly restricted to thirty and, most regrettably, many were disappointed. Those more fortunate, however, had a most memorable day with warm, sunny weather, excellent food and the best champagne they had ever tasted. This trip was subsidised by the Committee. The Annual Barbecue Ball was held in late August and a report of this function appeared in the last copy of the Journal. A substantial portion of the profits were absorbed by this event in the provision of an outside marquee, reduced prices in the bars, and three good bands. Very good food was provided by our College Hall catering staff, and it is a tribute to their efforts that everything was eaten. The spit-roasted pig was beautifully cooked this year, and as a result, did not satisfy the demand.

A final comment before closing this report relates to the occasional and justifiable complaints that the Bar is left in an untidy state and that the glasses are unwashed. We would like to take this opportunity to remind all our

patrons that the Bar is a Students' Union Bar and as such is the responsibility of everyone. Members of the Wine Committee are willing to do most of the work in keeping the bar respectable but it would greatly lighten the burden if everyone would confine their cigaretteends to the ashtrays and rinse their glasses after use. Lastly, we would like to express our thanks to the many barmen who have given so much of their time to running the Bar in the evenings: the Committee could not manage without their help.

Mark Whittaker, Chairman 1963/4



This is taking Central Sterile Supply methods a shade too far"

WHITHER SHALL WE WANDER?

By Jasper

THERE is such a wide range of pubs to choose from in London that it can often be very difficult deciding what to put in and what to leave out. This month however the task is easier, as I notice my colleague 'Argus' is writing about Southwark, and there are three pubs there that I think deserve mention.

The first, and I think, the best is the Anchor in Bankside. This pub can be approached from Southwark bridge, for Bankside passes beneath it on the south bank, and the pub is at the extreme East end, opposite a delightful 'gents' on the corner. It is an old pub, trading, as 'Argus' points out, on its association with Dr. Johnson. It is a Courage showpiece (the brewery is just round the corner and the price of best bitter, 2/6d. a pint in some bars suggests that it is the haunt of Americans "doing" London. But there's plenty of room and good atmosphere. There's a beautifully made model of the Globe theatre, a splendid



The Anchor.

view across the river from a kind of terrace opposite, and a very good restaurant, quite expensive. Just to show you how old world the place is, the barman to whom I was talking had never seen or read a James Bond film or book. Incidentally his name was Fleming.

Now wander East through the tiny streets until you come to Borough Iligh Street, and almost opposite Southwark Street you will find Talbot Yard, backing onto Guy's, which houses the George. This is another well-known period pub, with one large bar, wood throughout, rather drab, but effective. More people come to look at the place than drink there. I think some of these guided coach trips around Town include a look but no drink for its passengers. And then inside, if you've got sensitive feet you can feel a kind of vibration perhaps from some hidden machinery below. As the beer consumption increases so do the vibrations, (or one's perception of them) and one can sit delightfully stimulated in alcoholic stupor to fantastic dreams about what is really going on beneath, until some hamfisted visitor spills beer down your shirt. The George is also very well-known for its food, and they do snacks at the bar.

The third pub I mention for gimmick interest. Such is the competition among pubs that many resort to gimmicks, some successfully, others not so successful. Judge the gimmicky **Square Rigger** on the North end of London Bridge for yourselves. It is a subterranean pub, two floors and many bars. The place is bedecked with ropes and things denoting presumably that it's some sort of ship. I liked the artificial ship window effect in one of the bars, but I quite see it's not everyone's cup of tea. Try it once, and let me know what you think of it.

THE SEARCH FOR OLD DRUGS IN BRITISH GUIANA

Part 1 By D. P. Moody

As a chemist, I view the cell as an encapsulated assembly of molecular machinery to which materials are transported for processing and from which they are excreted as products. Since this activity is carried out at the mole-cular level it should be possible, inherently, to explain it in terms of chemical concepts and to modify it using chemical tools. These tools are merely other molecules, usually small ones

by biological standards.

It follows that when a physician wishes to produce a change of state in a patient it ought to be possible to provide the appropriate tool. It is still true, unfortunately, that our understanding of the machinery is so poor, because of its size and complexity, that rarely is it feasible to design and fabricate an appropriate tool in a logical manner. Therefore we must resort to empiricism. Much of present day therapy may be likened to a plane flying over a factory with the pilot dumping a liberal load of spanners in the hope that the right one wraps itself round the right nut and that none of the others gets into the works! This may be viewed as bad enough but even so it presupposes enough knowledge to choose spanners rather than a random selection from the toolkit. A little further pursuit of this analogy may help in the understanding of chemotherapeutic strategy. There are clearly two stages in optimising this kind of approach. First there has to be empirical selection of the right general type of tool and then a sharpening of skills in its use; there are, after all, many different kinds and sizes of spanner. In the chemotherapeutic field it is the latter, developmental, phase which requires vast resources of facilities and personnel in the painstaking approach to the optimum drug. The magnitude of the job is well illustrated by the statistics for one company which, starting from a firm lead, considers that employing 200 graduates and supporting staff to synthesise 5,000 variants on the theme and test them on up to ten species of animal represents a fair effort for one commercially and clinically useful drug.

To my way of thinking, this type of work is not and should not be the concern of workers in a medical college. It is comparatively low

risk work which if carried out on a sufficiently large scale will give a reasonable return on the capital employed. This makes sense of the commercial involvement in chemotherapeutic research and the resultant scale makes nonsense of the comparatively negligible contribution a few academics would make. However, this still leaves the need to expose leads and since we are relieved of the burden of making an annual return on such money as is invested in our efforts, we should accept responsibility for this high risk sector. Further, this job of probing into the unknown ahead of the main effort is precisely that for which a small "commando" is ideally suited. Much of the work consists of picking up information and ideas and trying to put them together in a way that begins to make sense. I believe that the toll of human misery is so great that we cannot afford to be proud or prissy about our sources

Since people in all human societies have suffered from diseases and presumably have attempted to cure them, a lead may be found in any culture. Cultures may be divided into two main classes, those which have writing and those which do not. There is a tendency for any culture which is able to record its medical knowledge to have some form of Pharmacopoeia. Once this has been produced and copies have been preserved then, in this context, destruction of the culture itself is of secondary importance because at any later date the record may still produce useful leads. An outstanding example is the ancient culture of India which produced the records of the Avurvedic system of medicine. It was these records which after a lapse of millenia prompted the investigations which led to the whole tranquiliser industry. On the other hand the knowledge inherent in a culture without writing is lost forever when that culture collapses under the impact of "civilisation" unless someone from outside makes a suitable record. Since the time from contact to collapse is often less than one lifetime the recording may be a matter of urgency.

My wife and I became convinced that two tribes of Amerindians on the Rupununi savannahs of British Guiana had had useful know-

ledge but were close to losing it all. We tried, without success, to encourage appropriately qualified people to make an expedition to recover what remained. We next offered to organise the expedition so that the qualified people would only have their own work to do. This produced a willingness to go but then we ran into trouble with fund-raising. Our main problem here was that all other sources were inhibited by the lack of any direct financial support for this work by Bart's. Finally, we decided that the job was urgent

enough to justify a data-collecting expedition by ourselves alone even though it would have to be done during the long vacation, which we knew to be the worst possible travel time on the Rupununi, and would have to be financed by mortgages and loans from friends and other sources. In fact, nearly half the expenses were raised from our bank at less than 24 hours' notice and we signed the loan form in North London at 10.30 a.m. withtake-off from London Airport scheduled at

2.30 p.m. on the same day.

Our plan of work was quite simple. The first phase was to establish our good faith with the piai (medicine) men and this was literally childishly easy since we had with us our two blonde blue-eyed daughters aged three and one and a half. I was absolutely fascinated by the devastating speed with which the girls converted stern and impassive Amerindians into honorary uncles and aunts and I was only slightly less astonished at the speed with which wives of greatly differing background got down to swapping obstetric histories. The final phase was to make a deal with the piaimen. In exchange for their knowledge we offered them a free choice between long-term prospects of an agency for plantcollecting or immediate instruction in some basic physiotherapy (my wife being an exsuperintendent physiotherapist). There was strictly no question of payment in cash because it was not our object to collect a complete flora of the region.

The technique was also simple in that it consisted of my wife establishing a base at a ranch while I wandered around the nearby



Dynamic explorer courageously confronts exotic animals.

villages. When we had had enough of one area we moved our base one ranch further south and carried on as before.

The Rupununi

Most of the ranchers in the area are the sons or sons-in-law of Harry Melville, who had two Wapisiana sisters as wives. Each rancher has proved somewhat fecund and so have those of their sons and daughters who are already adult. The result tends to be a benevolent family autocracy of weirdly mixed blood having influence in about 8,000 sq. miles of savannah. Another result, voiced to us with great feeling by a young man of the family, was the frustration of finding that all of the interesting girls at the dances were his aunts. The ranchers are quite poor by our standards because their 25 to 250 sq. mile spreads only carry about 8 head of cattle per sq. mile. Under these conditions a four year old steer gives 300-400 lbs. of meat and milk yields are as low as half a pint per cow. Ranching is still the traditional open range type with periodic round-ups, roping and branding in the corral, and long drives to the abattoir at the Government station. From there the meat is flown by Dakota to the coast. The cowboys are mainly local Amerindians and children of the ranchers, and their swarthiness is about the only difference there can be from the appearance of the American West of the last century. There is also a slight difference in terminology because of the local insistence that cattle and horses only understand Portuguese. Hence "cowboy" is actually a dude word and the cognoscenti refer only to vaquero.

The staple diet for ranchers and vagueros alike is tasso and farine. To make tasso a cow is killed in the early hours of the morning and rough strips of meat are flensed from the carcass. These are hung in the sun to dry and are ready by the evening. If kept dry the meat will last for a few days and, for reasons I do not understand, will not develop maggots in spite of all the flies on it during the drying process. Offal has to be eaten within hours. of course. The skin is stretched on sticks and left to the sun, flies, and maggots. In due course it becomes relatively clean, dry, and smelly and is then the rawhide used for making lassos, reins, whips, and all the other traditional cattle-range equipment. Farine is made from the tuber of the bitter cassava plant. The tuber is first "bashed" and grated, when a liquor begins to seep out. This liquor contains a high percentage of cyanide and is removed by squeezing the shreds in an ingenious basketwork sock. The solid residue is sieved and dried over an open fire to give a golden gritty material looking and tasting like sawdust. The liquor is not wasted but is boiled down to a thick brown source called kasarip which is supposed to be free from cyanide and is highly esteemed locally as a flavouring agent. An interesting point is that many of the wellknown sauces marketed in this country are based on kasarip. The staple diet is occasionally topped up with other meat. The venison is strong but unfortunately the savannah deer is on the way to extinction, the labba is a rodent vielding a mild meat tasting like both rabbit and chicken, pigeons are very tough and small, but a meat both common and good is stewed armadillo.

Of our family it was my wife who seemed to have the greatest affinity for animals. On waking up after a disturbed first night's sleep she found three dead mice on the floor. There were more squeakings in the second night so in the morning she searched the room for the cause. It was coiled up behind the door in the shape of six feet of young boa. On another occasion she was in the kitchen of the ranch when an anteater walked in. The sharp-clawed "tamanda" accepted some old rice as a reasonable substitute for ants and slowly toddled off again. None of us lost blood to vampire bats although their dive-bombing was a pestilential nuisance, but their small friends, the kaboura flies, more than made up for any failures. The flies and mosquitoes were not the only animals to have distinct preferences in choice of victim.



One quarter of the expeditionary force.

Many times I swam creeks without having any trouble with the "dreaded" perai (known as the piranha in Brazil) but my wife and one of the girls only had to dabble their feet in the creek to attract the attentions of shoals of small perai to any small wounds, while the other child was more or less ignored. Perhaps the most exciting animal was the dead cayman which came back to life as the children were about to inspect its teeth while the most amusing were the pet marmosets and the parakeet at one ranch. The latter is shown in the photograph with my wife, who was the only visitor it would go to.

Visiting the Villages

Much of my wandering round the villages was done on a savannah pony. These are small and in poor condition but nevertheless are extremely rugged if restricted to their "cruising speed" of 4 m.p.h. This speed is achieved with a single-footing gait, seems to be a genetically determined constant, and can be kept up for hours with loads of 250 lbs. while crossing dry shadeless savannahs. However, a short burst of speed will founder them and one hears of ponies used for two days on round-up and turned free for the rest of the year. I usually had one Amerindian guide cum interpreter riding with me and another somewhere on our trail with a pack bullock to pick up our collected samples. The two of us riding were completely self-contained: we each had a hammock in a waterproof bag and a small sack containing tasso and farine attached to our saddles. The only other gear

was one machete and one notebook. This extreme lightness of baggage was highly desirable when it came to crossing creeks too deep to ford. We had to unsaddle, swim across with the gear, come back for the horses, and dry them before saddling-up and going on our way. There is one tip for this type of travel which is worth bearing in mind since creek water is all that is available to drink. That is to opt for the most difficult upstream position in fording or swimming the creek. You then only have to lean a bit further upstream to get a clear drink without any stirred up

The villages are random collections of adobe huts with ité palm leaf roofs. The larger ones have a schoolhouse built in the same way and a rough airstrip nearby. There is a tendency for the water supply to be some way from the village in order to cut down the nuisance due to flies and the gardens in which the food is grown are always a few miles away in the forest. Slash and burn moving cultivation is practised, the virgin garden giving one or two good crops and then one poor one before having to be left fallow for twenty to forty years. None of the villages have any hierarchy or chief because the Amerindians set great store on independence and the rights and responsibilities of the individual. They are always prepared to listen, discuss, or be persuaded but generally they will ignore an order and get quite bloody-minded if it is repeated. Nevertheless they do have a tushawa whose function is to sense and voice the general feeling of the community and to give the signal to start work on any communal project which the group feels ready to tackle. Their guiding principle seems to be that no-one has the right to interfere directly in another's life. Anyone who persistently does positive harm to the community usually has the error of his ways pointed out to him and if he continues to do harm he is considered to be unreasonable and hence a nonhuman pest. If ostracism does not work the pest is quite ruthlessly eradicated.



Muking kasarip and pepper sauce; note the malnutri tion of mother and child.

Bearing in mind that the Amerindians have always had to live off the land on a hand to mouth basis since they cannot store food, their attitude can be seen to be reasonable. It is the imposition of our ethical code out of context by missionaries and police which destroys the equilibrium between the Amerindians and their environment. A typical result is the Waiwai tribe which was reduced from over 300 to two (both men) in a couple of decades. Even the most trigger-happy and ruthless Amerindians never reached this genocidal scale of eradication.

We usually arrived at a village towards dusk, attended to the horses, slung our hammocks in any convenient hut, and prepared our tasso stew. After a little while a few Amerindians would drift along for a natter and sometimes a helping of stew. They usually included the village piaiman or his agent, temporarily incognito. Quite casually and in the course of the general chat we would get an invitation to visit the piaiman's house and 'garden' during the following day. This nearly always implied an early start because of the tendency of the piaimen to live well outside the village.

(To be Continued)

THE EARLY DAYS OF RADIOTHERAPY AT BART'S

By N. S. Finzi

This is an attempt to record the beginnings and development of the Bart's Radiotherapy Department and what it owes to many bene-

factors and helpers.

Sir Norman Moore tells us that John Freke probably tried the effect of electricity on some of his patients as far back as 1748. An outstanding personality, Dr. W. E. Steavenson was appointed Electrician to the Hospital in 1882 and held the post until he died in 1891. He was succeeded by an equally great man, Dr. H. Lewis Jones, who was much looked up to by us younger workers from various other hospitals. (I remember consulting him in 1909, before I took up radium work).

Soon after X-rays were discovered, Bart's produced its first crude "skiagram" in 1896 in a cellar beneath the old Coroners Court Building, where the Pathological Block now stands and where the Electrical Department

was then placed.

Dr. Hugh Walsham became "Assistant Medical Officer to the Electrical Department" in 1896, and he succeeded Lewis Jones who retired in 1912. Walsham retired in 1918 and the X-ray Department was then separated from

the Electrical Department.

In the spring of 1913 I had been working for some six years on the staff of the Metropolitan Hospital and my colleagues, Gask, Gordon Watson and Elmslie, all Bart's men, persuaded me to apply for a vacant post of Chief Assistant (now termed Registrar) to the X-ray Department at Bart's. My application was successful.

ment at Bart's. My application was successful. The main work of the Department at that time was diagnostic and the therapy was of a very primitive quality. Nevertheless, Dr. Adamson, in the Dermatological Department treated ringworm by the very effective method of X-ray epilation, which he and Dr. Kienböck of Vienna had independently discovered. He also had satisfactorily treated rodent ulcers by X-rays. The minute amount of radium, which the Hospital possessed at that time, was quite useless for treating malignant growths. I personally had been using radium in quantities sufficient for treatment of some types of case, and I started using my own radium at the Hospital, mainly for cases of Mr. Harmer, in

the Nose and Throat Department and Drs. Griffith, Williamson and Barris in the Gynæcological Department.

After some months my colleagues and I worked out a scheme for the reorganisation and extension of the Department using space about to be vacated by the Massage Department. Dr. Walsham agreed to it and, with the help of Girling Ball, the scheme was submitted to the Medical Council, who passed it. All this took time and before the scheme could be implemented the 1914 War intervened and stopped further progress.

Later, when serving in France with the First London General Hospital in 1917. I was asked to get in touch with Mr. Raphael, the Consulting Engineer to St. Bartholomew's Hospital, who was also serving in that country. Together we devised definite plans for a great extension of the Department from two rooms and a developing cupboard to two diagnostic rooms, three therapy rooms equipped with 150-170 kV plants, a developing room with light trap, a viewing and reporting room, an office, dressing rooms and accommodation for registering patients, etc. Large storage space for films was provided for on the half-landing below and in the basement.

In 1919 this work was duly carried out and early in that year I was elected in charge of the X-ray Department and Miss Fovargue was appointed Sister to the Department. She remained with us until 1936, except for one short break, and was a very great help to me and the rest of us being both efficient and understanding. She returned to help out from 1942 to 1946.

Frank Hopwood, who was Assistant Lecturer in Physics to Mr. Womack was appointed Physicist to the X-ray Department in 1919, one of the first appointments of its kind in this country. He became Physicist to the Hospital in 1920 and, when Mr. Womack retired, the University established a Chair of Physics, with Hopwood as Professor.

My work with heavily filtered gamma rays from radium had suggested to me that shorter wave-length rays, given in doses that destroyed malignant cells had a less harmful effect on surrounding tissues and, therefore, proved more efficient than the X-rays we were then using. After some years it became evident that as our X-ray therapy equipment increased in energy and hence in penetration we were getting better and better clinical results. We heard about 1923 that Wintz and his physicist, Voltz in Seitz's Clinic were working at about 200 KV, so Hopwood, Donaldson, I and two or three others decided to go to Erlangen (near Nüremberg) and see what they were doing. On our return, we presented a report to the Medical Council and it was decided to try out this treatment for malignant growths on a research basis. The difficulty was the expense and also the priority given to the new Operating Theatres. However, that was got over by Dr. Donaldson, who persuaded a patient to give £1,500, or more, which enabled us to buy two 200 KV generating sets and X-ray tubes which would stand up to that voltage. These were installed on the 4th floor of the present Out Patients Block the old Clinical Lecture Theatre being demolished for this purpose. This Research Unit was formed with the help of Lord Horder, Dr. Donaldson, Dr. Canti, Sir Thomas Dunhill, Dr. Williamson and Professor Hopwood. In 1924 Dr. Walter Levitt was appointed, from a number of applicants, as Medical Officer in charge of the research. He was sent to study the work going on in other countries, especially Germany and Sweden, visiting a number of Clinics in these countries over a period of six months. Only certain scheduled types of growth were at first treated by the Research Unit, while on the third floor treatment of a number of diverse forms of malignant growth were treated at a lower energy on a routine basis under the direction of the Radiological staff.

It soon became apparent that we were getting better results with the higher voltages of the X-rays available in the Research Unit, and in my Mackenzie Davidson Lecture in 1933, I urged the necessity of trying out still higher voltages. Mrs. Meyer Sassoon heard of this through the Press and through Dr. Gow and Dr. Canti asked me to put up a case and a scheme for a Supervoltage Research Department. She responded with a most generous gift of £15.000 for the establishment of a "Million Volt Department."

After many investigations in conjunction with Professor Hopwood and Dr. Levitt of various higher voltage installations abroad and of Mr. Pullin's non-medical machine at the Royal Arsenal at Woolwich we decided that the firm

of Metropolitan Vickers of Manchester were the most likely to produce what we needed. Dr. Allibone of that firm agreed to construct the unit for £15,000, though it eventually cost them much more. He joined a small planning committee which included Hopwood, Canti, Donaldson and myself. This Committee was responsible for the design of the Department, which was eventually erected and called the Mozelle Sassoon Department. Mr. George Innes was put in charge of the construction of the unit and, when it was completed, installed it at the Hospital and has remained with us until the present time. He has undoubtedly played a great part in making it the success that it has proved to be.

A new building was erected behind the Clerks' Office to house this unit. The ground was excavated to allow for the height of the high voltage generators and the excavation required for the treatment floor. A corner of the building had to be recessed at considerable expense to preserve an old black poplar tree. Professor Hopwood, Dr. Canti, Dr. Levitt, Mr. Allibone and others were most helpful with details in the design of the Department. When the Sassoon Department was transferred to the new Radiotherapy Department, the Sassoon building was dismantled, and unfortunately, the roots of the tree were broken and it died.

As the centre of the tube had to be stationary, the floor of the treatment room had to be constructed so that it could be raised and lowered to bring the patient to the treatment beam, which beam could be angled about the axis of the tube. In order to obtain the greatest accuracy in setting up the patient, the floor movement was provided with a very fine double control by a hand-switch and an emergency foot-switch. The X-ray tube was continuously evacuated and its water-cooled target was faced with gold in order to obtain the most efficient generation of X-rays both in intensity and penetration. Continuously evacuated valves were used in the generators which supplied high tension to each end of the tube. The building contained consulting rooms, dressing rooms and offices for the Medical and Physics staff necessary for such a Department. A complicated arrangement of spherical mirrors allowed a ray-proof view of the patient from the control desk. Mr. Ralph Phillips was appointed Research Fellow in charge of the investigation with Mr. Innes to look after the physical side. Mr. Phillips resigned in the latter half of the war and the work was then carried on by my assistants and, when I retired, by my successors.

The Department then became part of the main Radiotherapy Department.

The Sassoon Department was ready to be used for patients at the beginning of 1937 by which time complete physical tests and measurements had been made. The Department was inspected by Queen Mary when she opened the new South Block and she showed great interest in its working. In 1937 I visited a number of "supervoltage" installations in the United States, but came across none that came up to our standard of accuracy or consistency of operation of our own machine.

It gradually became apparent, while I was still at Bart's that we were getting better results with the Million-volt machine than with our 200 KV installations; a typical example was carcinoma of the rectum cases which did much better. With doses high enough to get good results there was much less skin damage but

there was however a tendency to get occasional late fibrosis in the deeper tissues, which later we realised was due to the large doses we gave to one portal in one day. After I retired Mr. I. G. Williams was appointed to the Radiotherapy Department. He has continued the research into the use of still higher voltage with a 15 MeV linear accelerator and a cobalt unit. He is also studying the value of electrons from the linear accelerator in treating the less deep forms of malignant growths.

So it can be seen that Bart's has been a pioneer in the application of X-rays in the treatment of cancer, exploring the frontiers opened up by the use of higher and higher energy machines.

I am glad to acknowledge the great help I have received in preparing this account from the Librarian, Mr. Thornton, from Dr. Levitt and from Mr. Innes

PSYCHIATRY AT BART'S

By C. M. B. Pare

Someone once said that neurotics are the people who build castles in the air, psychotics are the people who live in them, and psychiatrists the people who collect the rent. We are left with the question of where the psychiatrists themselves live. In Bart's at present we occupy four rooms and two bathrooms, but in the coming spring are moving into handsome new quarters in Middlesex House.

To say that this is a sign of the coming of age of psychiatry, as a branch of medicine smacks of the cliché, but is a hard statement of fact. It also expresses our feelings of anticipation of what we all expect to be an age of rapid progress in psychiatry.

Everyone knows that organic disorders may precipitate a psychiatric illness, that psychiatric symptoms frequently complicate a physical lesion, and that emotional conflicts may play a large part in the psychosomatic disorders. Yet few people realise that patients with the most typical manic-depressive and neurotic disorders present with a somatic complaint in seventy per cent of cases. Not unnaturally, both the patient and the general practitioner

often prefer that the patient be investigated at a general hospital. When he arrives, our first job is diagnosis.

A formulation is then made, setting out the causes of the patient's present illness, and the treatment necessary not only to relieve his present disorder, but if possible to correct any maladjustments between his personality and his environment which may have precipitated the breakdown and may predispose to a relapse. Finally, an attempt is made to predict the outcome of the present illness and the likelihood of recurrence. In many cases, a diagnosis and formulation as above are sufficient to enable the G.P. to manage the case himself and the patient can then be discharged after the one visit, to be referred again if the G.P. wants further guidance.

Other patients require hospital treatment, either as an in-patient or out-patient, at least initially. The Department has three beds on Annie Zunz and Dalziel wards, where the sisters do their best in a rather difficult situation. It is most frustrating not to have adequate beds in Bart's to look after our own patients when

admission is required. The difficulties are especially obvious when patients become psychiatrically disturbed while still ill for a surgical, obstetric or medical reason. In these cases there may be an invidious choice between transporting an ill patient to another hospital where the medical services may not be of the standard of Bart's, or exposing the other patients in the ward to his distressing behaviour.

Finally, a large proportion of our time is spent either in supporting particularly difficult patients in their attempts to lead an independent life outside hospital, and in psychotherapy for a relatively few patients to enable them to reach a better and more permanent adjustment. As this treatment is so time-consuming, it is practicable only to tackle the more glaring faults and even so, in only a few cases where it is thought that the response will best repay the work put in, realising that the time spent on any one patient must necessarily be at the expense of another.

Every year we see eight hundred new patients, the total attendances in Out Patients being over nine thousand, which gives an average of eleven attendances per patient. In addition to their other duties, Dr. Ireland and Dr. Tannahill, our Senior Registrar and Registrar, are always on call, and with Dr. Merry give us a twentyfour hour service for emergencies. Moreover, we try to arrange our Out Patient waiting list so that there are always a few vacancies for patients who need to be seen quickly. Helping in Out Patients, particularly for psychotherapy are our Clinical Assistants, Dr. Stevenson, Dr. Lovel-Barnes, Dr. Johnson, Dr. De Alarcon, Dr. Darquier and Dr. Greeves, and Dr. Bevan-Jones specialises in child psychiatry. Dr. Rose supervises the Out Patients' E.C.T., and it is to his credit, and that of the nurses and anæsthetic staff that in 20 years, and in giving 15,000 treatments there has been no death, nor any complication of any severity.

Working closely with the doctors are Sister (Miss Stanner), and the psychiatric Social Workers, headed by Mrs. O'Neill, who explore the home situation, support the relatives, guide and try to correct any attitudes which may be aggravating the patient's symptoms, and help in rehabilitating the patient by finding him a job, etc. Our psychologist, Miss Holt, may be asked to test the patient's I.Q., or his specific abilities, if there is doubt about the suitability of his work, and perhaps after further tests to suggest more suitable employment. Completing

the department are the secretaries and clerks, who not only have to deal with appointments but look after the psychiatric notes, which are filed separately in our own department because of the confidential nature of some of the material.

The Future of Psychiatry in Bart's

There is no doubt that the major psychiatric illnesses such as schizophrenia and endogenous depression will, before long, be subdivided into biochemically distinct entities, this in turn leading to big advances in treatment. As part of an undergraduate teaching hospital we are ideally placed to contribute to such advances, and the governors, recognising this, have generously supported the research we are doing in collaboration with the departments of Biochemistry and Pharmacology.

A completely new approach is also being developed in the treatment of neurosis. Neurotic patients can be regarded as having learnt abnormal responses to various situations and stimuli, and on the basis of learning theory, these can sometimes be abolished by deconditioning, and more normal responses developed in their place. The role which "behaviour therapy" is likely to play in psychiatry and its relationship to psychotherapy is at present uncertain, but it is an extremely promising line, and we hope to appoint a principal psychologist experienced in these techniques by the time we move to Middlesex House.

As I mentioned above, we hope to move into Middlesex House, where we will have enough room to see all our out-patients, early next year. Not only will this ensure privacy during psychotherapy, but it will also enable abreactive techniques and E.C.T. to be given as and when required and create facilities for behaviour therapy.

There remains the problem of patients too ill to remain out of hospital. I have indicated the necessity for a small in-patient unit at Bart's, and the hospital has given us high priority to fill this need.

The Medical Council has also recommended the building of a day-hospital, and this has been included in the Ministry of Health ten year plan. This would enable many patients to receive the in-patient care and treatment necessary for their disorder, yet fits in with modern psychiatric thinking that the patient should be kept in the community and near his family as far as possible.

Finally, we are fully aware of our teaching responsibilities, and this has been very much in our minds in making plans for the future.

OTHER PEOPLE'S CARS: 1960 MORGAN PLUS 4

By James M. Robinson

After discussing three somewhat exotic vehicles in previous articles it seemed to me that a car a little closer to most people's idea of normal road transport might be of interest. However to write about a common or garden mass produced car seemed pointless, so I chose one of the world's few remaining genuinely hand built cars, the Morgan, owned by Mark Rendall.

Morgan started making sports cars in about 1910 as a small family business and little has changed over the years; the factory is still a family concern presided over by Peter Morgan and produces about ten cars a week, each car taking six weeks to complete. Apart from the engines, which come from Triumphs or Fords, depending on the model, and some steel body pressings, all is made by hand from the distinctive radiator grill to the upholstery. The body style shows more than a hint of pre-war sports car tradition with flared wings, long bonnet and cut away doors. Morgans have had and still have a fine competition record, from the One Hour record at Brooklands (59.8 m.p.h.) in 1912 to 1st place in the Two Litre Grand Touring Class at Le Mans in 1962 (94.0 m.p.h.). It seems hard to believe that drivers at Brooklands took those spidery little three wheelers round the banking at speeds up to 100 m.p.h. Forty years ago Morgans introduced a sliding pillar type of independent front suspension, also used by Lancias but I don't know who thought of it first; this suspension is still used almost unchanged today, the principle being if it works why change it.

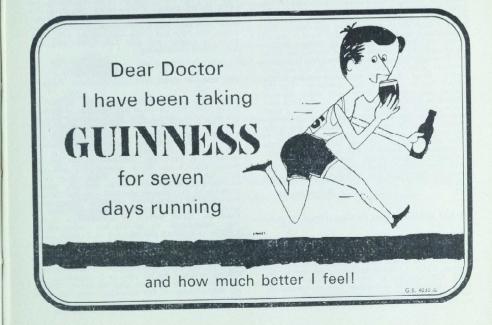
Mark's car is the 1960 Plus 4 model, a two seater fitted with a TR3 engine of 1991 c.c. The gear box is fitted remotely from the engine so that the gear lever is very conveniently to hand, with no remote control required. The box is manufactured by Moss Gears Ltd., a firm owned by Alfred Moss, father of Stirling Moss. The seats incorporate air cushions and are very comfortable. However I found the back of the seat not quite so good, for it felt as if some of the padding had shifted and was a bit hard. The driving position is rather old fashioned with the driver very close to the wheel, which is of unusually large diameter—more reminiscent of pre-war racing cars than of today's relaxed, straight arm driving technique a la Moss, Fangio, etc. The performance of the car is well up to expectation; acceleration is fierce with the light car well suited to the big



The 1960 Morgan Plus 4.

TR engine. The car is beautifully stable on good roads and gives a surprisingly smooth ride over such surfaces, but over rough roads the limitations of the suspension show up and high speeds could be disastrous as the hard springing seems unable to maintain adequate tyre contact with the road. The noise level is high as might be expected but does not make conversation impossible; with the hood down most of the noise is due to the wind, with the hood up this might be reduced but engine noise would be more noticeable. Mark's car was one of the last of the all drum braked cars, and the front wheel disc brakes fitted subsequently would be a great improvement, and not just a sales gimmick, as there is a hint of fade after high speed braking. The old fashioned driving position is necessary as the steering is firm and direct and requires some effort which would be exhausting or impossible with straight arms-definitely not a lady's car. It is hard to fault the Moss gear box, the movements being not excessive and precise, but it seems a pity not to have synchromesh on first gear. I cannot say anything about the weather equipment as it was not necessary to use it, but Mark told me that it does not flap about at speed and is reasonably water proof, though there is a tendency for the occupants to get their elbows wet when water enters over the

The sort of person who buys a Morgan is willing to put up with a little hardship for the sake of thoroughbred quality and performance. It is not designed as a family hack or a shopping car but many owners use them as such of necessity and are happy to make allowances for the pleasure of owning one of the last real sports cars. After all this criticism and praise there remains yet one question—how can Morgan's take six weeks hand building this masterpiece and still sell it at a competitive price?



NEW PENGUIN BOOKS

Britain in the sixties—The Other England, by Geoffrey Moorhouse. Penguin. 3s. 6d.

The two Englands implied in the title of this short book are the "Golden Circle" (London and affluent commuter land) and the "Other England" (the Provinces). Geoffrey Moorhouse questions the assumption that "what goes on in and immediately around London tends to be upheld as a norm of society as a whole". In an endeavour to prove that the provinces have a vital life of their own he describes areas of the "Other England", in particular Cornwall, the West Midlands, East Anglia, the Black Country, Lancashire, Yorkshire and the North East. He has produced a very readable and as far as an outsider can judge, a very accurate picture of day to day existence in each of these areas. This is life in all its diverse aspects as it really is, not as sentimentalists and "new wave" film directors would have us believe. Not everything that Mr. Moorhouse has to say about England to-day makes pleasant reading but it may well be argued that no Englishman has a right to cherish foolish and out-dated attitudes about his fellow countrymen.

Jenny Miller.

Physical Fitness. Penguin. 3s. 6d.

This book claims to be a "Get fit and stay fit course for today's town dwellers" and contains two series of physical training programmes. The exercises, simple and well explained, are supplemented by charts through which one works to gain fitness. The recommended age-fitness level in the charts is that of the average Canadian and is not really high enough. The system was developed in the Canadian air force and is designed to promote fitness with minimum aches and pains. It does this efficiently but the pace is slow. Stage jumping is not recommended by the authors but it is better than boredom. For the younger man there are better and more vigorous methods of getting fit but for the middle aged man with a sagging middle this is a good book. I must stress that to gain full benefit from the system ten minutes dedication every day is required—this is the only set back!

The second half of the book is devoted to fitness for women. It claims it will not produce undue muscularity—a good thing! The exercises are similar to those found in most women's magazines. The charts are useful and easy to follow. So roll those hips girls!

Brian Ayers.

The Girl with Green Eyes, by Edna O'Brien. Penguin. 3s. 6d.

Miss O'Brien's second novel, originally published as "The Lonely Girl" (Jonathan Cape, 16s.) has now been added to the Penguin list, under the title "The Girl with Green Eyes". Her first novel, "The Country Girls" (reviewed in these pages earlier this year) was received as an outstandingly brilliant novel. It is difficult to summon such enthusiasm for her second attempt, which is a continuation of the story of Caithleen Brady and her friend Baba.

These two young Irish country girls have been working in Dublin for two years, and are seeking excitement and romance in an attempt to compensate for, on the one hand their strict Catholic upbringing, and on the other, the instability and misery wrought by the drunkeness and bawdiness of the life which surrounded them in the country.

Caithleen who is unsophisticated, and rather a dull character, is drawn to and falls in love with Eugene, who is a sophisticated and educated Austrian. He is separated from his American wife and his film-writing world is completely foreign to Caithleen. She finds in him a loving and kind paternal figure. Such a person she has never previously known, and subconsciously replaces the position of her father. But their relationship becomes far more than platonic, and they become lovers. The remainder of the story tells of their times together, and their attempts to mix their two entirely different worlds, which however are not compatible. At times the story is very amusing, especially the attempts by Caithleen's irate and drunken father to destroy their relationship, and in places it is moving and pathetic. But the whole story leaves one bored and unsatisfied and is a poor repeat of "Country Girls".

Miss O'Brien, certainly has ability, and her dialogue and description flow with a pleasant and easy style, but under separate covers her two books are a poor duplicate of what might have been one outstanding novel. As a novel "The Girl with Green Eyes" will help pass a train journey, or a few idle hours, but little else. The film though, with Peter Finch as Eugene, and Rita Tushingham as Caith leen, is well worth seeing.

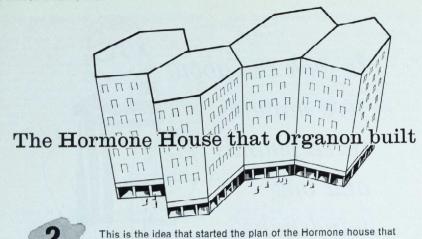
Martin Hudson.

The Rose of Tibet, by Lionel Davidson. Penguin. 4s. 6d.

With the Chinese invasion of Tibet in 1960 as background, Mr. Davidson has produced a fascinating adventure story. The plot concerns Charles Houston, a London artist, who goes out to Tibet with the vague intention of looking for his lost brother. After a hazardous journey under formidable weather conditions Houston finds himself in the monastery of Yamdring. Unfortunately for him, the monks mistake him for a re-incarnated god, and keep him under close guard. Before long he is having a forbidden love affair with his female counterpart, the fabulous she-devil. As the Chinese invade Tibet Houston sets off with the she-devil. taking with them millions of pounds worth of Emeralds. Hotly pursued he still manages to survive unblemished. In the end fate catches up on him; he is captured and returned to England alone, in a semi-delirious state, remembering little of the whole affair.

The author goes to great length to claim authenticity of the story, but manages to produce only dubious evidence for his case, as it appears no one has heard of this Houston after his return. This is my only criticism of this otherwise superb adventure

Benny Lee.



Organon built.

the house that Organon built.

This is the researcher who had the ideas that started the plan of



This is the rat that was there at the start, as well as the cows, the sows and rabbits that enabled the researchers to probe the secrets of the hormones which built the house of Organon.



These are the workers who mixed the chemicals that joined up the molecules to make the bricks of the house that Organon built.



This is the doctor who found that the hormones helped his patients and prescribed the products of the house that Organon built.



THE HORMONE HOUSE

Organon Laboratories Limited, Crown House, London Rd., Morden, Surrey

It took me about & five minutes three pounds and one handshake to open an account with Barclays





The five minutes were mainly spent in writing a couple of specimen signatures and in giving the name of a suitable reference. The three pounds-all I could bank at the time-was received with a cordial handshake and I was made to feel welcome. Nothing stuffy about Barclays. You don't believe me? Try 'em.



June in Her Spring, by Colin MacInnes. Penguin.

June Wesley is 16 and just back from school, she meets Benny Bond in the local gymkhana, and immediately falls in love with him. June has a delinquent psychopathic brother Arthur, who has been thrown out of school many times, and now leaches around the place finally ending up in a mental hospital after causing an uproar in the local pub. Benny is an orphan who lives on a chicken farm with his homosexual uncle. Then things begin to happen, old man Wesley finds out that his son's mental defect is inherited from him, Benny makes love with June. Arthur returns and tries to rape sister, father commits suicide, and everything comes to an abrupt end.

The book is written with an easily readable style, and the author quite rightly employs a clinical approach, neither moralising nor criticising. The most important point about writing novels dealing with people with certain abnormal mental traits is to ensure that the plot is credible. Mr. MacInnes, I feel, has introduced too many psychiatric types in too restricted a plot. One reads the book in a light-hearted manner, much as one reads a thriller, or a James Bond: but one remains unconvinced.

Benny Lee.

OTHER REVIEWS

The Choice of a Medical Career, edited by Joseph Garland and Joseph Stokes, 2nd edition. Pitman Medical. Price 45s.

This series of essays on the various careers that are open to a medical graduate, is intended as a guide for students and the newly qualified. The menu is long and complete, but for the most part rather indigestible. Much of the writing is so bad that one is left with the impression that the editors must have been hard pressed to find enough willing authors, and the chapters on Psychiatry and Otolaryngology in particular are enough to kill any interest in these specialities that the reader may have brought with him.

Here of course is one of the problems in producing a book of this kind. Authenticity demands that the writing should be done by an expert in the particular field under review. But it often happens that such a person loses during the course of his specialisation (or perhaps never possessed), the gifts of clear and attractive expression. This is more usually apparent in the spoken than in the written word, and as such is a dilemma of all higher

But even with a more generous patronage from the Muses, I rather doubt whether this book could have achieved its object. How does a person decide what department of medicine he is going to specialise in when he qualifies? His decision is not based on any description of a particular speciality that he once read in a book; nor, as one of the authors suggested, on an awareness "of his own interests, personality traits, emotional and intellectual needs, goals and capabilities." The choice, if that is the right word, is usually determined by the influence of a particular person and by the opportunities that present themselves. These and other points are excellently brought out in the chapter on surgery, (whose author rejoices in the unlikely name of Mr. Englebert Dunphy); this is by far the best essay in the book and well worth reading.

And then the book is American: by Americans, and about American medicine. This has several repercussions. In the first place each chapter contains detailed advice about training programmes, which is irrelevant for the British reader. Secondly the division of specialities in the States is not always the same as it is here-radiology for example

includes both the therapeutic and the diagnostic departments. And throughout the book there is a liberal scattering of phrases that may not have an international appeal; for example—"a proper sociologic and psychological relation conducive to intraand inter-personal harmony.'

The exorbitant price of this book suggests that the publishers are not expecting to sell a large number of copies: they will not be wrong.

M.D.

Essentials of Fluid Balance, by D. A. K. Black. Third edition. Blackwell Scientific Publications, Oxford, pp.164, 25s.

When such a well-known book reaches a third edition it would hardly seem that a review could add anything to its established value, the demand and need for a third Edition speaks for itself.

The book is a synthesis of the academic and clinical approach and provides a balanced account of the subject. The third Edition is considerably altered and the chapter on acid base balance is based on the Brousted Lowry concept, and aptly called "Hydrion balance". The text is not overloaded with tables and lists; such lists as are necessary are worked into the text and serve to illustrate the basic changes common to the conditions. The few tables serve to amplify the text and do not detract from it.

This is an excellent book for the membership candidate or the postgraduate seeking an introduction to the more advanced aspects of the subject. They will be considerably helped by the excellent bibliography containing references to principle hand-

work and reviews. The very close synthesis of academic and clinical material is probably beyond the average undergraduate. The content of the book is unnecessarily complicated as an undergraduate text and considering the largeness of the syllabus for the final examination to recommend this to the general undergraduate would be overloading an already large reading list. It is to be recommended to the undergraduate with a special interest or those doing a B.Sc. in Physiology

It is said that a cheaper format or a paper back edition could not be produced. Twenty-five shillings for 164 pages in such a rapidly changing field seem expensive, particularly for the undergraduate.

Pocket Book of Physical Signs in Medicine, by H. Fuld. London, H. K. Lewis & Co. Ltd. 1964. 181pp. £1 5s.

Every medical student realises, or should realise sooner or later, that the eliciting of physical signs is a systematic process. In interpreting them he knows that most diseases fall under one or other of a few headings, for example, developmental defects, trauma, inflammation, new growth, degenerative disorders; there are, in addition, various glandular and biochemical abnormalities.

The reviewer not unnaturally turned first to the chapter upon respiratory diseases and was glad to find a systematic approach. General inspection lists the various features that must be considered, and some unusual ones as well such as evanosis due to overdosage of codeine for rheumatoid arthritis. In considering the shape of the chest, the first listed cause of asymmetry is congenital hemiatrophy. The words themselves are straightforward enough, but their juxtaposition raises difficulties. Congenital means, so far as the reviewer is concerned, present at birth. Atrophy would seem to imply that some-thing which was previously trophic has become atrophic-in this case on one side only. The differential diagnosis of such intra-uterine aberrations would have most clinicians at full stretch.

There is much to admire in the book, particularly in the chapters upon the nervous system, but pocket books present many problems to their authors. Some contain many lists and charts. Others, including this one, rely principally upon the text which is necessarily disjointed. If rather fewer facts had been included, the final year students and housemen for whom it was written primarily would find it rather easier to read "the essentials sufficiently condensed for two or three evenings of study."

N.C.O.

Practical Dermatology, by I. B. Sneddon and R. E. Church. Edward Arnold. 20s.

This short book admirably lives up to its title of 'Practical Dermatology'. As recommended by the authors it should be read at the same time as doing clinical dermatology, that is during the dermatology course for students and for all general practitioners. It is strong on prognosis and sound up-to-date treatment and would serve as a good pre-examination freshener, covering just the sort of questions examiners are prone to ask. On the other hand it does not delve deeply into ætiology, histology, rareties, clinical subdivisions and biochemistry, which accounts for its trim figure. Most of the numerous black and white illustrations are excellent.

Dermatitis and eczema are discussed quite fully in the light of modern ideas and the chief types clearly delineated, with sensible and not over-elaborate treatment. The authors' enthusiasm for apophthegms such as 'hand eruptions often start on the feet,' written in italics at the end of the early chapters. caused a mild allergy to them to develop in your reviewer, but fortunately they vanished from most of the later chapters before any alarming symptoms of anaphylactic shock developed. In the short chapter on anatomy the marked regional differences in texture of the skin and therefore in tolerance to external applications should perhaps have been mentioned. In the fungus section the authors adhere to the view that many hand eruptions are secondary to tinea pedis, a proposition rather under fire from some

quarters nowadays; also the development of hypersensitivity and immunity, although well authenticated in the systemic mycoses, has not really been established in the epidermophytoses. Some would frown on the continued use of applications containing mercury in psoriasis in view of the possibility of systemic absorption. Urticaria, purpura, acne, pig-mention and drug eruptions are well done, although the omission of streptomycin from the latter section is surprising. Perhaps older dermatologists should be given a sedative before reading the peremptory dismissal of prurigo, the subject of so much fascinat-

ing speculation in the good old days.

The book is a new book and gains thereby in crispness and momentum over some older textbooks which have been revised from time to time but almost inevitably betray their venerable lineage here

Review of Gross Anatomy. A Dynamic Approach, by Ben Pansky, Ph.D., and Earl Lawrence House, Ph.D. Published by the Macmillan Company, New York, and Collier-Macmillan

The widespread current interest in a revised pre-clinical curriculum is reflected in the many new textbooks appearing on the market. Most of the new anatomy books, however, have been cast in the traditional mould and few have been notably successful. The present book, designed especially for revision purposes, represents a fresher approach.

The format is unusual: the traditional detailed descriptions, relieved here and there by pictures, have gone and the illustrations have become the core of the book with the text complementarythis technique has long been used effectively in a number of French student texts. Three-dimensional visualization, the essence of effective anatomical study, thus receives more than the usual emphasis.

The body is dealt with regionally with adequate overlap, ensuring continuity. Each region is subdivided into a number of sections, each consisting of illustrations on the right-hand pages with corresponding descriptive matter on the opposite left-hand pages. The illustrations are all line drawings and are the work of one of the authors (Pansky); the great majority of the 1,000 figures are in black and white, but colour has been used occasionally for special effects. These line drawings are beautifully clear and realistic; the artist is expert at adapting this difficult technique to anatomical illustration. The accompanying text of each section is written in terse, "telegraphic" style, and often concludes with a short note on the relevant clinical considerations.

The concept and execution are, on the whole, admirable, but the book has one shortcoming: rather frequently there are irritating discrepancies between the anatomy as described and that illustrated. This is particularly unfortunate in a book of this type where text and illustrations are so interdependent. This confusion often seems to arise from the fact that many of the figures are apparently redrawn from various original sources (often recognizable though frequently not acknowledged) which show features either not mentioned or differently described in the text. In addition the anatomical accuracy of some other figures leaves something to be desired.

Despite these criticisms the book is one of the best synopses of topographical anatomy available. Al-

THE MEDICAL PROTECTION SOCIETY

ADVICE · DEFENCE & FULL INDEMNITY FOR DOCTORS & DENTISTS AT HOME & OVERSEAS

50 HALLAM STREET · LONDON · W.1 Tel: LANGHAM 9241 Secretary: Dr.H. A. Constable.

though consisting of over 400 pages, half of these are occupied by illustrations and the book is thus realistically brief; however, it contains sufficient information for the preclinical student. It seems well suited for quick revision of the essentials of gross anatomy, either just before the 2nd M.B. examination or during the clinical years. It is available in two forms: in the modern strong paperback style at £2 15s, 0d, and in hard covers at £3 15s, 0d.

Handbook of Medical Treatment, by M. J. Chatton, S. Margen and H. Brainerd. 9th edition, 1964. Blackwell Scientific Publications, Oxford. 715 pp. Price 37s. 6d.

The latest edition of this handbook, which has earned a well deserved place in the pockets and libraries of most American medical students and recently qualified practitioners, is a welcome arrival. It provides concise and authoritative advice on the treatment of all the common and many less common diseases, based on a cautious and reasoned approach to therapeutics. This information is contained in a book measuring 7 x 4 x 11 inches, which therefore fits comfortably inside the pocket of a white coat. The subject matter is constantly reviewed and a new edition appears every two years. Thus recently introduced drugs of undoubted merit are discussed in addition to more conventional therapy.

Separate chapters are devoted to the diseases of each system and in each section brief descriptions of the causes and symptoms of a condition precede details of both its emergency and routine treatments.

In addition there are comprehensive accounts of fluid and electolyte therapy, the treatment of a wide variety of poisoning as well as psychiatric, infectious and metabolic disorders. An account of the essentials of cardiac resuscitation is well illustrated and there are sensible recommendations for the medical requirements for foreign travel.

Throughout drugs are referred to by their U.S. official names which in almost all cases correspond with the B.P.C. Approved Names, so that there are no difficulties in identifying the treatments suggested. The therapy described is, in general, the same as that used in British medicine, although one can of course find views which would not be accepted here. However there are remarkably few of these points of disagreement.

In the regrettable absence of a comparable British handbook of therapeutics, this small volume can be recommended to British medical students and practitioners, who would have no difficulty in adapting the advice given to suit their requirements. It would be a considerable comfort for the newly qualified houseman to have this book in his pocket on his duty days.

G.M.B.

SPORTS NEWS

SPORTS FIXTURES FOR NOVEMBER

- 4th Hockey v. King's College Hospital: Away. Cross Country v. St. Mary's College, Twickenham.
- 7th Rugby v. Falmouth: Away.
- 9th Rugby v. Penzance: Away. 11th Rugby v. Dartmouth: Away.
- Hockey v. Gore Court: Away 14th Rugby v. Old Alleynians: Home.
- Hockey v. Bexlevheath: Home. 18th Hockey v. University College Hospital.
- Boat Club: U.H. Regatta.
- 21st Rugby v. Oxford: Home.
- Hockey v. Old Oakmereans: Home: 25th Rugby v. No. 5 District Police: Away. Hockey v. Imperial College: Home.
 - Cross Country: U.L. League (Div. I) meeting.
- 28th Rugby v. U.S. Chatham: Home. Hockey v. National Provincial Bank: Home.

RUGGER CLUB

26th September v. Trojans at Chislehurst. Won 38-3.

This was just the type of opening game that every fifteen wishes could happen. Bart's gave a sparkling display of fast open rugby to firstly mesmerize and finally completely overrun a Trojans side that was let down by poor covering and tackling. Five weeks hard training, and a lot of thought about the new laws paid dividends, and the whole side responded by running with the ball at every opportunity; backs and forwards revelled in the extra room to move, and the most promising feature was everybody's eagerness to back up other players. It would be unfair to single out any one player after such a fine team effort, and credit must go to the whole side, on a great display.

Scorers: Harris-three tries. Savage-three tries. Browne, Goodall, Letchworth and Pope one each. Harris one conversion, Gibson three conversions.

30th September v. Reading. Won 18-13.

We travelled to Reading to play an evening game on a very hard pitch. The side again played well, but not up to last Saturday's standard. Fine backing-up by forwards led to tries by Smart and Letchworth, after good running by Goodall and Browne. Pope had opened the scoring with an early try, and Letchworth rounded off a good personal game by clinching the match with a try after a scissors movement with Griffiths. Several weaknesses were however exposed, especially the inability of the side to tackle the jinking opponent when standing still, and the tendency to slacken off when well in the lead. Reading scored two fine tries through their centre, and might well have forced a draw but for their wing knocking-on with the line at his mercy.

3rd October v. R.M.A. Sandhurst, at Sandhurst. Won 11-5.

Bart's took the field against a very fit fast Army side, on a hot, dry afternoon without Orr and Gilmore. However Knox and Delany came in and played very well, and a win was a good result. The side got off to a slow start, but led at half-time 11-0, thanks to two penalties by Gibson, and a fine try by Savage after Letchworth had made a half-break. The usual second-half slackening-off came, and Sandhurst hit back, scoring once, and coming near several times. A win was just deserved, but more points could have been scored if the threes had used the considerable possession which the forwards gained, by utilizing the amount of room in which they had to

The Club offer's its congratulations to Mark Orr, who has been selected as reserve for Hertfordshire county side.

SWIMMING CLUB

v. Old Whitgiftians. Lost 34 pts.-16 pts. Water Polo: Lost 7-3.

In this return match Bart's put out a scratch team which in the circumstances acquitted itself very well. The swimming was not of a high standard although Kettlewell's second in of Shorey added greatly to our scoring capacity the freestyle and Hanley in the backstroke are as well as the cunning (?) of the tactics, whilst both worthy of mention. In the water polo, Ruoss helped the defence. Of the newcomers tactics and a liberal interpretation of the rules many showed great promise and training and gained us four goals which were quickly lost inculcation of the basic rules should result in when one member of the side had to retire two above average sides in the coming United on account of cramp.

Team: Hanley (Capt.), Britton, Kettlewell, Anderson, O' Kane, Pogmore, Bates.

WHAT



IT STANDS FOR security and peace of mind from the day you qualify-until the day you retire-and after. IT STANDS FOR the provision of advice on all your professional problems . . . for legal assistance in any difficulty or proceedings of a professional nature . . . for unlimited indemnity in respect of damages and costs in the event of an adverse verdict or a settlement out of

IT STANDS FOR THE MEDICAL DEFENCE UNION the oldest and largest organisation of its kind in the world. Further particulars can be obtained from

THE MEDICAL DEFENCE UNION

Tavistock House South, Tavistock Square, London, W.C.1

Secretary Dr. Philip H. Addison

A. H. R. Rowe. B.D.S., F.D.S.

September 22nd. Westminster Hospital Invitation Relay. Bart's 2nd.

The lack of opposition in this relay meant that we had to swim against the Westminster themselves, and had Britton remembered the elementary rule of a straight line being the shorter distance between two points we might have acquitted ourselves better. In the same gala the Bart's nurses relay team did well to come fifth out of a large entry.

Team: Hanley, Anderson, Britton, Garson.

WATER POLO

v. London Hospital, Won 8-7.

In this pre-season friendly fixture we recruited two old stalwarts to the side-Shorey and Ruoss, as well as a large selection of newcomers. The result was a very close game with a good standard of water polo. The presence Hospitals league. We hope to do well.

Team: Britton (Capt.), Shorey, Ruoss, Anderson, Garson, Vartan, Atkinson, Rimmer, Bates.

B.J.B.

GOLF CLUB August 12th. Cup Match Semi-Final. v. Middlesex at Hendon G.C. Lost 3-2.

A very hot afternoon and the Golf Course in excellent condition made this an enjoyable but disappointing match. Although fielding a strong team we lost the match at a 19th hole play-off after the result became $2\frac{1}{2}$ - $2\frac{1}{2}$. In this case the last match to finish goes to a definite result.

Unfortunately after being 2 up for most of the match Atkinson lost 2 holes in succession to be all square at the eighteenth. At this stage Stephenson and Vartan had lost their matches and Weston-Buit and Bowen had both won. Bart's made a hurried exit when Atkinson lost to a birdie 3 at the nineteenth.

Team: Atkinson, Stephenson, Bowen, Weston-Burt,

2nd September Bart's v. St. Mary's at Moor Park G.C.

Played over the high course at Moor Park this proved a very interesting game on a hot afternoon. The fairways were dry and fast, and the greens very soft and well watered. Atkinson, Weston-Burt, and Vartan all had close matches which they won at the sixteenth or seventeenth hole. Davies lost narrowly after

Team: Atkinson, Weston-Burt, Vartan, Davies.

FIFTY YEARS AGO

From the Bart's Journal of November, 1914

Extract from a letter from Sir Anthony Bowlby to Mr. Edgar Willett.

I spent last week at Paris and its neighbourhood, and towards the front, and came back here because there are about 1000 wounded in the hospitals here. . . . The shell wounds vary from slight to horrible. The rifle wounds are slight and not important as a rule. The shell fragments drive clothing and mud deep into the tissues and cause both tetanus and spreading gangrene in many cases; we treat the latter by free incisions and injections of hydrogen peroxide subcutaneously, and if we get them soon enough they do well enough to save life and sometimes limbs. Most of

the tetanus cases die, in spite of prophylactic serum, at the field hospitals.

Our own hospitals are excellent, and admirably run and equipped. They are the envy and admiration of the French "medicals." and the fine weather has enabled us to get all the tents up and fitted very comfortably There are Bart's men everywhere, and they are doing very good work. . . . I am just off to dinner, and then to meet trains of wounded. The latter are not nearly so numerous this last week, I am glad to say.

Before you commit yourself to a practice, work 3 or 5 years in the R.A.F.

You'll do some interesting, out-of-the-rut medicine, see a bit of the world, and 'retire' with up to £3,000 in cash

3 things to think about:

1. You can take your first GP appointment after, rather than before, your first practical work as an out-ofhospital doctor. And there are good reasons why you should. After 3 or 5 years you'll know what sort of doctoring you like best, and do best; you'll know, if you're a round peg, what a square hole looks like.

2. If you don't see the world now . . . can you honestly put your hand on your heart and say you will do it later?

Are you in your pre-Registration year? Then here are 3. £3,000—what a wonderful start to a GP career! For full information please write giving your age and qualifications to Wing Commander D. G. M. Hills, M.B., B.S., D.P.H., R.A.F., Ministry of Defence (MAI) (IQ142B) 1-6 Tavistock Square, London WC1.





CONTENTS	
VOX	487
The Disabled Child and the City Hospital	
by D. F. Ellison Nash	488
Behind the Scenes: the Department of	
Archives by N. J. Kerling A Year in Southern Rhodesia by George	493
A Year in Southern Rhodesia by George	
Gardos	495
Around and About by 'Argus'	497
The Search for old Drugs in British	
Guiana by D. P. Moody	500
Students Hospitals and Prizes in the Nine-	
teenth Century by Walter Radcliffe	503
An Interesting Obstetrical History by N.	
C. G. Richards	505
Other People's Cars	508
Other People's Cars The Words of Dying Men by T. J.	
Cloggei	509
Whither Shall We Wander? by Jasper	513
Book Reviews	515
Sports News	519

PUBLICATIONS COMMITTEE

Chairman: Dr. A. W. FRANKLIN. Deputy Chairman: Dr. G. H. FAIRLEY.

Editor: C. J. KELLY.

Review Sub-Editor: G. R. HAMILTON. News Sub-Editor: M. A. P. S. DOWNHAM.

Social Sub-Editor: Miss J. BELL

Photographic Sub-Editor: B. C. P. LEE

Sports Sub-Editor: R. E. ATKINSON

Manager: J. R. SWAIN.

Asst. Man. (Subscriptions): A. R. BAILEY. Asst. Man. (Advertising): R. L. COOPER.

Nurses' Representative: Miss M. IRONSIDE.

Artist: P. CULL.

EDITORIAL

The first few weeks of the new government have provided plenty of interest, not least to the observer of the medical scene. Mr. Kenneth Robinson, on his first public appearance as the new Minister of Health, is quoted as saying "It is no longer tolerable for outpatients to be expected to give up an entire morning or afternoon for the purpose of seeing the hospital doctor". The Minister went on to say that he realised the difficulty of the task but that the efforts were well worth making for the sake of the patient and for the reputation of the hospital. Readers may remember that in our September issue we publicised the sad case of a patient, who had an appointment at an outpatient department at Bart's, but had to wait for two and a half hours. At the time, we wrote that this state of affairs was disgraceful and we now welcome the Minister's words. However Mr. Robinson will be judged not on his words but on his actions.

There are, however, two actions of the new government that we are unable to commend. The first is that the Minister of Health is no longer a member of the Cabinet. This is a difficult decision to understand and amounts to little less than an insult to the medical profession. The other action is more

important from a national point of view: this is the extraordinary decision to abolish prescription charges. We have said before that there can be few people in Britain who can not afford these charges, although we are in favour of abolition of the charges for pensioners. These charges go part of the way to offset the enormous bill for the National Health Service: apart from this, the fact that drugs are not given away like green stamps acts as a salutary reminder that they do cost money and this must be met. Unfortunately once this step has been taken it will be difficult for any future government to reverse. This is a vote-catching effort if ever there were one. While on the subject of money we note that it is now certain that M.Ps. are going to vote themselves a very large increase in pay; we will find this more easy to stomach if the government do not turn on the rest of us and ask us to tighten our belts in the interest of the national economy. The medical profession is notoriously bad at seeking to improve its own position but now that the 'friends of the workers' are in power we must not be shy about publicising the maladies, financial and otherwise, that beset the profession. We must not be afraid to use the present short supply of doctors as a weapon.

We wonder at the reluctance of the political parties to deal with the thorny problem of immigration. Most people seem to agree that immigration must be controlled but not stopped. London Transport and the National Health Service, strange bedfellows, both depend on immigration for their very survival. Most provincial hospitals can only continue because of the immigration of doctors qualified in the Commonwealth. The government must realise that the time will come when these doctors will no longer need to come to Britain for experience as their own countries expand and their own hospitals grow. What will happen to our provincial hospitals when this supply of medical men dries up? An increase in medical schools far greater than any envisaged at the present is needed.

The staff of the *Journal* wish all their readers a very happy Christmas.

Correspondence

WIDOWS AND ORPHANS OF MEDICAL MEN

Sir,—I write to bring to notice the work of the Society for Relief of Widows and Orphans of Medical Men.

From time to time attention has been drawn to the deficiencies in the N.H.S. Superannuation Scheme, particularly in the case of widows and orphans of those doctors who die in the early years of practice. In the event of death within the first ten years of service, the only benefit payable to the widow is a lump sum which varies with circumstances, but can be reckoned as approximately the average annual remuneration, as defined by the regulations, during the three years preceding death. If death occurs after the ten years but before retirement, the widow will receive a pension of "one third of the pension which he would have received if he had retired on the day before he died." It is obvious that this might leave a widow with young children in very difficult circumstances in either case. Some doctors, no doubt, insure to cover these risks, so far as their means allow, but the premiums which they can afford to pay, and thus the amount of cover, are likely to be limited. Experience shows that, in spite of all that the doctor can do, cases of hardship not infrequently occur. In such cases this Society can give valuable help—and give it promptly. Where a widow's income does not exceed £300 p.a. net after payment of income tax, the Society may make her grants. It also has funds from which to make grants for the children up to the age of 16; and, if education is continued, beyond that age. These grants are conditional on the doctor having been a member of the Society at the time of his death, and for at least two years previously. Last year the Society paid out £4,677 to widows and orphans. At the end of that year the accumulated funds were valued at over £127,000. For a doctor under 35 years of age the subscription is £2 2s. 0d. p.a. Membership is limited to those who, at the time of joining, are resident not more than 60 miles from Charing Cross; but subsequent removal beyond that distance at home or abroad does not affect membership or benefits. It follows that the best time to join is as soon as possible after qualification whether single or already married.

This Society was founded in 1788, was incorporated by Royal Charter in 1868, and is registered under the Charities Act 1960. All of its directors—who are unpaid—are medical men. Further particulars may be obtained from the Secretary at 11, Chandos Street, Cavendish Square, London, W.1.

Yours very truly,
Dr. W. Lloyd,
President of the Society
for Relief of Widows and
Orphans of Medical Men,
140, Harley Street,
London, W.I.

30th October.

TEACHING AND PATIENTS

Sir,—As one who is spending his retirement in carrying out Cancer Education of the Public in order to diminish Fear and Ignorance and thus to obtain more early stage cases, I was very interested in your Editorial (Nov. 1st). Everybody will agree that after having heard the history and elicitated the physical signs, the doctors and students should withdraw from the bedside and discuss the case out of hearing of the patient. But this must be done in the case of all new patients however trivial the disease, because patients will soon realize that talks away from the bedside mean a serious illness, or as one patient stated "If you become an interesting case, you had better make your will"

It is also essential to make it the duty of someone, Registrar or House Surgeon, to explain the condition to the patient as far as possible on the same day. Often the explanation will be very indefinite such as, "We can't say exactly what the trouble is before further tests are made, and we have watched you for a day or two. We may have to look inside, but we will have you home again very soon." To lie in bed wondering what is really the trouble is Hell.

Yours truly,
Malcolm Donaldson.
9th Nov. (Cancer Information Association)

THE HOSPITALS AND G.P's.

Sir,—It is often glibly stated by the staff of the Hospital that the great majority of the present generation of students will become General Practitioners. There is in existence a voluntary scheme of attachment to a General Practitioner, and from time to time lectures are delivered upon the subject. Such appears to be the policy of the Medical College. The hospital appears to have no policy with respect to General Practitioners. We learn for instance, that G.Ps. in the surrounding area have no

access to investigations carried out on patients in the Out Patients department. This hardly commends General Practice, good General Practice, to students.

An examination of two non-teaching hospitals in the Midlands is revealing: a Coventry hospital allows G.Ps. full access to their diagnostic services, extending these facilities to domiciliary use. G.Ps. in the area are able to request x-ray investigations such as intravenous pyelograms, and cholecystograms. The ability to request 'barium meals' and 'haemoglobins' without a detour via Out-Patients has meant that the practitioners have no longer 'lost' interesting patients whom they are competent to treat and enjoy treating.

In Nottingham the practitioners are only allowed the simpler diagnostic x-ray procedures such as plain abdomen and chest, which have been enthusiastically received, as have the facilities at the nearby pathology laboratories.

It is a sobering reflection that the 'Royal and Ancient', which is at the forefront in many fields, does not offer local G.Ps. the commonest x-ray investigation: a plain chest x-ray, or even a simple haemoglobin estimation.

This is not very encouraging to those of us who will become General Practitioners.

Yours faithfully,

Andrew Bacon,
10th November. Abernethian Room.

Calendar DECEMBER

Sat. & Sun., 5th & 6th.

Sir R. Bodley Scott Mr. Hunt Mr. Burrows Dr. R. A. Bowen Mr. McNab Jones

Sat. & Sun., 12th & 13th.

Dr. Cullinan Mr. Naunton Morgan Mr. Manning Mr. G. Ellis Mr. Hogg

Sat. & Sun., 19th & 20th.

Dr. Hayward Mr. Badenoch Mr. Aston Dr. R. W. Ballantine Mr. Fuller

Sat. & Sun., 26th & 27th.

Dr. Spence Mr. Tuckwell Mr. Burrows Dr. I. Jackson Mr. Cope

Physician Accoucheur for December is Mr. G.

Bourn

Engagements

CANTRELL—GRUNSELL.—The engagement is announced between Dr. E. G. Cantrell and Miss E. A. G. Grunsell.

DIAMOND SMITH.—The engagement is announced between Dr. J. G. Diamond and Dr. P. A. M. Smith.

FRY—TYLER.—The engagement is announced between Dr. David Edmund Fry and Barbara Louise Tyler.

JENNINGS—LAYTON.—The engagement is announced between Dr. Melvin C. Jennings and Dr. Deanna C. Layton.

ROBERTSON—MILLIDGE.—The engagement is announced between Alistair Colin Robertson and Pamela Mary Millidge.

WARD—TUCKETT.—The engagement is announced between Dr. Richard H. T. Ward and Hilary Patricia Tuckett.

Marriage

McGrath—Mann. On August 21, at Brompton Oratory, Dr. Brian Michael Joseph McGrath to Sheila Mary Mann.

Golden Wedding

OULTON—FLOWER.—On August 18, 1914, Ernest Vivian Oulton, to Nellie Flower. Present address: 96 The Drive, Hove, Sussex.

Births

Ball.—On October 10, to June (née Madge) and Dr. P. J. Ball, a son (Martin Hugh). King. On October 12, to Elizabeth (née Huber) and Dr. David King, a daughter (Catherine Jane).

Martin.—On September 16, to Julia and John Martin, a daughter (Lucy Charlotte Ann).

Death

STORER.—On October 22, Dr. John Storer, M.R.C.S., L.R.C.P. Qualified 1911.

DRAMA SOCIETY

Nursery Productions. December 8th. Three one act plays by Giraudoux, Pinter, and Mortimer.

ABERNETHIAN SOCIETY

Thursday, December 10th. Dr. G. H. du Boulay "Neuroradiology".

RUGGER CLUB BALL

The Annual Rugger Club Ball takes place at College Hall, Carterhouse Square, on 3rd December. Double Tickets 30s.

FIFTY YEARS AGO

From the Bart's Journal of December, 1914

REBUS RAHEREBUS

With advice we would welcome the Freshers who find

Themselves in the halls of the great master mind,

Whose name we have learnt to respect and revere-

We refer to none other than Doctor Rahere Of one thousand one hundred and thirty-third year.

If by chance you should find that sharply at six

The cloakroom is closed with your coats and your sticks.

We hope that this thought will comfort and cheer—

'Tis one of the laws laid down by Rahere
In the thousand one hundred and thirty-third
year.

That the Reading Room's shut you will learn with distress,

When it falls to your lot on a Sunday to dress; If you ask us the reason—the answer is clear—Oh, was it not so in the days of Rahere.

In the thousand one hundred and thirty-third year?

Perhaps you will want to work in a ward At some early hour that is not in accord With the views of the Sister (she may be a dear).

And certainly not with those of Rahere
Of the thousand one hundred and thiry-third
year.

It now and then happens a houseman will curse

For the want of a bed, or the lack of a nurse, When he's bound by the tape so red and so dear

That dates from the days of Doctor Rahere In the thousand one hundred and thirty-third year.

Perchance you will rail at some intricate rule Of life in the College or Medical School: But grumble you must not, but strictly adhere, For were not these rules set forth by Rahere In the thousand one hundred and thirty-third year?

VOX

Crime

The Rugby Club all left in fine style for their Cornwall Tour, but none finer than the fly-half, who was given a special send-off by Her Majesty's Prisons. Such in fact was their hospitality, that he found it hard to leave.

The Journal has always prided itself on its impartiality, and as an example of this we freely admit that one of our previous editors has been in court recently. Despite the gravity of the case we were unfortunately able to spare only a relatively inexperienced reporter, who flashed back the startling news that our friend had got six months; happily this proved to be a matter of driving disqualification rather than detention.

A more serious offence was the theft, during a dance at Charterhouse, of the portrait of Richard Owen, the well-known comparative anatomist. After a nation-wide search for this masterpiece had failed to yield a single clue, the Medical College was beginning to think in terms of an international gang—when suddenly news comes from our man in Brighton, Ian Sherlock Miller, that he has strong suspicions about the University of Sussex. A brilliant deductive sequence, the cunning complexity of which prohibits a full account at this stage, but which can be summarised briefly as a matter of buying a few drinks for the boys, led Miller not only to the discovery, but also to the recapture of this integral part of our heritage.

Detection is also the hobby of a retired Sussex solicitor, who has a camera fitted to the windscreen of his car so that he can photograph motorists breaking the law. His most recent snap was of the car in front of his crossing a double white line. At the court case which resulted from this clever bit of work, the opinions of the different parties about this form of detection varied considerably. The photographer insisted that he was sacrificing his popularity in the cause of road safety; the magistrate said it was a pity that he could not manage to have his camera in a bush outside a bank at the time of a robbery; and the defendant was sympathetic about the problems posed by retirement.

It is well recognised that press headlines frequently exploit ambiguities. But the Daily Mail really went to town a short while ago with the caption, 'QUEEN FINED FOR SMOKING'. Further reading revealed that this was not in fact the case, but that one of our larger liners had been convicted for smog-production by the New York harbour authorities.

And Punishment

The hundred day programme. A hundred days and a hundred nights, and already there's quite a crowd out there fasting in the wild—Mr. Smith, EFTA, de Gaulle with his *entente concordiale*, the Rachmans, the car-owners, and a leper. And just imagine what the capital gains tax will do to Fred's profit margin.

There are only two ways you can win now (and still remain tempted yet undefiled). One is by being a ten-shilling widow, which is not in fact as naughty as it sounds, and the other is by becoming a member of parliament. 'Those who serve the state'. we are told, 'should be able to discharge their duty without undue financial worry'; this should make an equally good punch-line for other state-workers—from the houseman to the steelman.

The balance of power has so far been shared between the Liberals, the weather, and those who treated Mr. McLeavy's bursitis (which incidentally was of the infrapatellar variety, and therefore presumably the result of over-zealous preparation for the debate). 'Then the master of the house, being angry, said to his servant, Go out quickly into the streets and lanes of the city, and bring in hither the poor and the maimed and the halt and the blind'. They came all right—all 307 of them.

The hundred day programme? NSMAPMAWOL, I'm afraid.

THE DISABLED CHILD AND THE CITY HOSPITAL

By D. F. Ellison Nash.

The City of London in the present century has never had a large child population and yet for at least 60 years the City has maintained a very intense interest in the welfare of crippled children. In contrast, the infant citizens were in the early part of the last century a cause of great concern; Lambert (1963), in his recently published biography of Sir John Simon, the first Medical Officer of Health for the City*, refers to the "appallingly high mortality of infants which gave the City of London unenviable prominence among the larger more squalid towns of Regency England". He refers to the fact that this struck the well-to-do homes of the Minories as well as the surrounding hovels of the poor. This high infant mortality caused the parents of John Simon to move from the City to the suburb of Blackheath. However, under modern local government organisation, the City Corporation has never been a local education authority.

Howard Marsh (Surgeon, St. Barthlomew's Hospital, 1867-1888) was a prime mover in the foundation in Queen Square of a home which later became the Alexandra Hospital. This was adopted by St. Bartholomew's in 1920 and moved to the Kettlewell Convalescent Home at Swanley. (Yes—Bart's then had a convalescent home!) Reference is made to the "Alex-

andra" later.

In 1895 Sir William Treloar organised a dinner at the Guildhall for a number of the poorest of London children. He found, however, that many of them were crippled and unable to come. From this he started his Hamper Fund, and in 1910 nearly 7,000 disabled children received Christmas hampers. Following an appeal when he was Lord Mayor of London Sir William collected over £60,000. The Daily Mail Absent Minded Beggar Fund had borne the cost of building what was then known as the Princess Louise Hospital at Alton for convalescents from the Boer War. The War

*Before becoming M.O.H. to the City of London, Simon was a surgeon at St. Thomas's. The first recorded attempt at uretero-colic anastomosis was described by him in the Lancet in 1852. The patient was a child with ectopia vesicae.

Office had no further use for this building and handed it over by special Act of Parliament to the first trustees of the hospital, one of whom was Sir William Dunn.

In 1908 the Lord Mayor Treloar Cripples' Hospital at Alton was started in timber huts which had been erected to form a casualty hospital for the South African war. The medical genius who inspired Sir William Treloar to make this provision was Henry Gauvain who qualified at Bart's in 1906. Gauvain built up Treloar's on a basis of surgical tuberculosis at a time when there was virtually no treatment but only nursing care. He evolved original therapeutic methods and by his shrewd observations of the disease processes and a combination of mechanical ingenuity and manual dexterity, he founded a system of splintage for which many middle-aged and elderly patients today will always be grateful. Sir Henry Gauvain remained in charge at Alton until his death in 1945. For many years he had continued to supervise the Farringdon clinic where he followed up the after care of the London children who had been at Treloar's. Sir William Treloar's City friends faithfully supported Treloar's Hospital and College over the years. Dr. Hugh Thursfield, the oddity of whose character is referred to in Dr. Geoffrey Bourne's recent publication, We Met at Bart's, (1963), was the consultant pædiatrician at Treloar's. He had been an assistant physician at St. Bartholomew's and was also on the staff of the Hospital for Sick Children at Great Ormond Street. Mr. T. Just was E.N.T. consultant and undertook periodic mass tonsilectomies on Sunday mornings sermons for which the junior R.M.O. had to anesthetise. Various voung Bart's men joined the resident staff between the two wars and the inspiration which they received from the personal teaching of Sir Henry Gauvain was perhaps the main factor which kept them in this field of orthopædic surgery. Among these were Mr. H. H. Langston (now Chairman of the Central Consultants and Specialists' Committee), Mr. E. E. Harris who subsequently went to Chailey where he was orthopædic surgeon for a number of years before joining the staff of the Ministry of Pensions. I was privileged to join the team at Treloar's in 1935 and in those days

REMARKS

ON THAT KIND OF

P A L S Y

OF THE

LOWER LIMBS,

WHICH IS FREQUENTLY FOUND TO ACCOMPANY A CURVATURE OF THE SPINE,

AND IS SUPPOSED TO BE CAUSED BY IT.

ITS METHOD OF CURF.

TO WHICH ARE ADDED.

OBSERVATIONS on the NECESSITY and
PROPRIETY OF AMPUTATION,
IN CERTAIN CASES,
AND UMBER CERTAIN CIRCUMSTANCES.

By PERCIVALL POTT, F. R. S.
And SURGEON to St. BARTHOLOMEW'S HOSPITAL.

Verumque est ad ipsam curandi rationem nihil plus conserre quam experientiam. CELSUS.

LONDON:

Printed for J. Johnson, No. 72, St. Paul's Church-Yard.

Frontispiece of treatise by Percivall Pott

the responsibility placed upon a recently qualified doctor was really rather horrifying in retrospect. One was expected to give anæsthetics for major "blood letting" surgery at a time when transfusion was quite difficult to arrange. Away from the big cities there was no organised panel of donors, and blood banks had not been heard of. Vinvl ether (vinesthene) had just become available and its action as a safe nonnauseating anæsthetic agent for repeated short procedures in children was quite superb. One was responsible for the basic pathology and the general medical care of scores of quite ill children suffering from tuberculosis. Dr. Philip Quibell (Bart's, 1937), now the Medical Administrator at Chailey Heritage also passed through Treloar's in his training. The sight of rows of small children lying in spinal boxes with two or three vertebræ collapsed from tuberculosis, many of them with paraplegia, was indeed a sorry spectacle and psoas abscess aspirations formed a regular weekly list.

Mr. Stanley Evans the present resident orthopædic surgeons at Treloar's qualified at Bart's and subsequently was Medical Superintendent at Queen Mary's Hospital for Children, Carshalton. Queen Mary's, prior to the introduction of the N.H.S. was the L.C.C's main hospital for crippled children.

Treloar's offered a high standard of training in orthopædic nursing and many of the staff came to the London teaching hospitals for their general training. The hospital has now changed its original function and become a general unit, but the College for training the non-hospital disabled boy has been upgraded to provide grammar school education and a "100 place" grammar school for girls is planned. The advent of anti-tuberculosis drugs completely changed the picture of child disability and as students know only too well Pott's disease of the spine is now a great rarity in England. Fig 1 illustrates the frontispiece of this remarkable surgeon's principle treatise.

Apropos Pott's paraplegia, one of the most distinguished Bart's men, H. J. Seddon, knighted this year, was, in 1933, awarded the Robert Jones' prize for his work and writing on Pott's paraplegia. Seddon was the first Nuffield Professor of Orthopædics (University of Oxford), and is now Director of the Institute of Orthopædics (University of London), of which Mr. Jackson Burrows (President elect of the British Orthopædic Association) is Dean—facts not generally realised at Bart's.

Returning to an earlier decade, Reginald Elmslie, the first orthopædic specialist on the full staff at Bart's, became the first surgeon to the school medical service in London and was an active pioneer in the early days of the Central Council for the Care of Cripples.

During the 1939-45 war the pattern of child care was very disturbed by the movement of population and the unco-ordinated development of hospital services other than for war casualties. As the incidence of tuberculosis declined so the occurrence of paralytic poliomyelitis increased, and in 1947 there was a great epidemic which filled many places in the long stay orthopædic hospitals which would otherwise have been empty from the decline of tuberculosis. In the post-war decade greater attention was paid to the management of children suffering from cerebral palsy. Improvement in obstetrics and neonatal care increased the survival of these children and the group became a major one in the orthopædic hospitals. Those of us who were working in children's hospitals

in the immediate post-war period saw increasing numbers of grossly deformed children suffering from the effects of myelomeningocoele and other congenital spinal trouble. Many of these infants who had escaped meningitis, or whose meningitis had been successfully treated with the sulpha drugs or penicillin had been allowed to develop gross deformities—the so-called infirmary legs-with hips and knees flexed from lying on one side with the powerful psoas muscle in action unopposed. "What can you do for an incontinent paralysed child?" This was the question and the orthopædic surgeons' answer was, "Nothing worthwhile." The majority of these children died before the age of 10 from ascending urinary infection. No one wanted to look after them, the residential schools could not handle more than two or three at a time in a group of perhaps 50 disabled children because of the smell, the sepsis and the constant relapsing ill health.

By the early 1950's the annual mortality from spina bifida had fallen from approximately 1,400 in 1942 to about 700. The birth rate had risen, the mortality has fallen even further and there are thousands of these children who have survived with a varied degree of paralysis. The group has received scant attention from the profession until the last five years and neurosurgeons and orthopædic surgeons, overburdened with their enlarging specialities have been deterred by the apparently hopeless outlook and by their memories of the pre-antibiotic

During the war with the establishment of National Spinal Centres for the treatment of traumatic paraplegia, considerable attention had been paid by urologists to the management of the paralysed bladder, but this was a problem entirely different from the congenital paraplegic who had grown up with incontinence and without the slightest idea of what it meant to be dry. The uriniferous child was shunned by his school mates and the parents were filled with despair.

When the lumbar cord is involved in the spinal damage the detrusor muscle is often paralysed, the bladder becomes passive and grossly diverticulated and the ureteric orifices incompetent. Retention with overflow leads to gross bilateral hydronephrosis with infection. A better understanding of this mechanism and the introduction of more adequate cystographic X-ray investigations led to a definitive programme. Relief of the bladder outlet obstruction by transurethral resection was made possible with the miniature McCarthy resectoscope which is a delicate instrument with a telescope

about 6" long and a diameter the size of an adult ureteric catheter. When we first used these miniature instruments, diathermy cutting was somewhat uncertain because the output of the sparkgap machines was inadequate. Modern valve-operated electro-surgical equipment has, however, made these miniature resectoscopes extremely effective, to relieve obstruction, to save kidneys and save life. As far as the boys were concerned the instrument makers have provided over the years a succession of improved articles which stand the strain of football (when the orthopædic disability permits) and other activities.

The Bricker procedure, "urinary ileostomy", was introduced into this field of surgery in Great Britain in 1954 (Nash, 1956). In this operation an isolated segment of ileum has its proximal end closed and its mesenteric leaf fixed to the posterior abdominal wall, the two ureters being implanted in an isoperistaltic direction. The distal end of the segment protrudes as an ileostomy inverted to leave a spout at least 2" long covered by healthy mucosa. The secretion of mucus from this outer surface does a great deal to protect the surrounding skin from urinary maceration and once the patient learns the knack of sticking on the collecting appliance she is for ever more completely free from the embarrassment of urinary incontinence. This has been one of the most dramatic advances in child rehabilitation we have ever seen. Having reached the position in which we could assure the parents and the orthopædic surgeons that we could deal with the urinary incontinence, we were then able to press for corrective surgery to put straight those limbs which were so deformed as to be useless for weight bearing.

Up to 1958, whether to operate initially on the spinal defect was a matter which all of us found very difficult to decide. Were we to bury the exposed spinal cord, preventing the leakage of cerebospinal fluid in the hope of preventing meningitis, while perhaps running the risk of increased paralysis from operative intervention? Many believed-and some unfortunately still believe, that it was quite wrong to interfere with this spinal tumour and that surgery might make the paralysis worse. There was a high mortality from early surgery as indeed in all forms of neonatal operative work. In the last 6 years there have, however, been so many advances that the future has completely changed. One of the biggest risks has always been the development of hydrocephalus as a primary complication of spina bifida due to the Arnold

Chiari malformation of the base of the brain, or secondary meningitis. The introduction of the Holter valve in this country in 1958, though it is by no means the perfect answer, has made it possible to overcome the immediate hazards of hydrocephalus with a fairly good prognosis for enduring control. Once again therefore opinions have changed and there are now very few who would deny the value of immediate surgery in the new-born baby who has a spinal defect. It has been proved

conclusively that those babies whose spinal cords are covered early have a greater chance of retaining movement in the limbs than those whose cords are left to dry, to become stretched by the rising pressure within the sac, or to become infected from exposure. In fact about 40% have virtually no significant limb paralysis if operation is within 24 hours of birth. If, however, early surgery is to be effective it must be done under ideal conditions, the baby must be moved to a special centre within a few hours of birth and the exposed myelocoele must not be covered with greasy tulle gras, but with a sterile saline or non-adherent gauze. When a baby with a myelocoele is delivered there is a natural feeling of horror on the part of all those concerned with the birth. If paralysis is extensive the baby's temperature may fall very fast and many who have come to us at Bart's and elsewhere for surgery have arrived with temperatures too low to be registered on an ordinary clinical thermometer. The hazards of surgery are greatly increased by such cooling and it is absolutely vital that these babies should be transported in heated incubators. It is not sufficient to wrap a baby up in many shawls. Fig. 2 shows the standard battery heated portable incubator used for ambulance transportation.

This rush to surgical assistance cannot, however, be undertaken until parental consent has been obtained and it is at this point that the wise and well informed pædiatrician can present the father with the facts without being too depressing, but at the same time making him fully aware of the hazards and complications that may arise before or after surgery. The obstetrician, pædiatrician or midwife who is



Fig 2. Battery heated portable incubator.

foolish enough to tell the mother or father that the baby will die in a week or so will regret the utterance as many survive to lie or sit as a living memorial to clinical pessimism.

What becomes of the children as they grow older? Is it right to preserve the life of the paralysed incontinent child? It will be remembered how members of parliament and others at the time of the thalidomide crisis suggested that it was wrong to preserve these young lives. No one would dare express such a view today now that it is known that much can be done to make such limbless children mobile and independent. The various parties of Bart's students who have visited Chailey Heritage during the last two years have seen the large strides that have been made in the development of artificial limbs-and so it is with the child with paraplegia. If his deformities are prevented, his incontinence controlled, and if he is given an adequate opportunity for normal social contacts appropriate to his age group, the child may well develop into an independent useful citizen. With modern techniques approximately threequarters of those who come to early surgery survive. We have now passed the point at which there should be discussion about the ethics of preserving these lives. Intelligence is not necessarily impaired though a small number of these children are in fact ineducable. Even in the worst cases, removal of the spinal tumour makes it possible for the mother to take the child home and look after it without feeling that she has a monstrosity.

Going on to the older age group the problems of education have been tackled by the establishment of a special school with the object of

taking all these incontinent children out of other schools where they were ostracised and gathering them together where their total problem of incontinence, infection, deformity, paralysis and trophic ulcers could receive special treatment. Coney Hill School, of which I have the privilege of being Medical Director, was opened 5 years ago at Hayes in Kent by the Shaftesbury Society. The original provision was for 32 children but the demand for accommodation was so great and the success of the experiment so obvious that in May of this year a £55,000 extension to the school was opened providing more places and much better facilities. This is the only school in the world where urinary incontinence is an entry qualification and yet here is a community of healthy, clean and very normal (personality-wise) children enjoying life to the full. The City of London contributed handsomely towards this project through the Sir William Coxen Trust Fund. The Trust was established in 1954 under the will of this former Lord Mayor of London with this injunction, "... to apply... such income for the benefit of or to pay over the same to all or any of the Orthopædic Hospitals of England and other Hospitals or Charitable Institutions carrying on similar work . . . it being my feeling that young children up to the age of 14 years should be periodically examined to see that they are growing into healthy men and women and that correction in any faults in them that may arise should be made from time to time and it is my desire . . . from time to time appoint a Committee of six Aldermen of the City of London four of who have passed the Chair . . . to administer the Trust Fund."

The Coxen Trust has made numerous generous gifts for child rehabilitation and paid for the unique assessment block at Chailey. The Trust is in the hands of the Court of Aldermen of the City of London, a distinguished hody still well represented on the Boards of Governors of our Hospital, and of the Medical College.

In retrospect it is a tragic paradox that Bart's lost its opportunity to remain active in this field of child rehabilitation on the same day that approval was given for the go-ahead for Coney Hill. This decision was a striking example of how the many Government medical departments are still unco-ordinated, largely because their medical officers are advisory and have no executive function. The Alexandra Hospital for Hip Disease (founded really in 1865 but given this title in 1881) was adopted by Bart's and moved to Swanley (now the site of the hospital

laundry) in 1920, and in addition there remained a country unit on the main Guildford-Leatherhead road at Clandon which had earlier been the main hospital. With outbreak of war the hospital was evacuated to Luton and remained under the ægis of Bart's until its closure in 1958 Mr. A. L. Moreton, known to many Bart's men, was surgical Superintendent and Girling Ball, the third Dean of the Medical College was an active visiting surgeon. In spite of many representations on behalf of St. Bartholomew's hospital the Ministry of Health decided that the accommodation for long stay orthopædic patients in the area served by Bart's was more than adequate and that the Alexandra Hospital must close. St. Bartholomew's had acquired a site near Nynn Park and it had been the intention of the Governors to build a long stay orthopædic hospital there. Plans were advanced, but neither money nor permission was forthcoming and the death of the Alexandra Hospital was the final nail in the coffin of the long association of the two hospitals. There is, however, a close clinical association between Chailey Heritage and St. Bartholomew's. Mr. Jackson Burrows and myself visit regularly and Mr. Derrick Coltart until his death was an active participant in the team work which is so necessary when dealing with multiple handicaps in a single child. Dr. Philip Quibell (Bart's, 1937) is Medical Administrator and Dr. F. A. Pearson (Bart's, 1947) is one of the senior resident staff. Mr. Percy Jayes and Dr. Aldren Turner are visiting consultants. The late Commander Murray Levick (Bart's, 1902), medical officer on Scott's Antarctic expedition, was the first medical administrator at Chailey and a most active worker in this field of medicine. He was also founder of the Public Schools Exploring Society.

The pattern of disease has changed but the problems of the crippled child remain. The social conscience of Great Britain leads the world in the care of children and whatever may be the arguments against a State Health Service, facilities and provisions which we have today would not have been forthcoming under any other system. Charitable Trusts and individuals make possible experiments and projects which cannot be undertaken within the rigid budgeting system of the N.H.S. and the vision of men like Treloar, Nuffield and Coxen have made possible the development of programmes which subsequently find their way into the National Health Service network.

Bart's and the City have played a great part in child rehabilitation, a very British aspect of medical care. Perhaps one day the Alexandra Hospital will be re-established, or at any rate commemorated in some tangible form within the bounds of our great hospital: perhaps too St. Bartholomew's Hospital may regain a "Kettlewell" convalescent home which was given up for the more pressing needs of the crippled child.

REFERENCES

BALL, W. GIRLING (1923): Alexandra Hospital for Treatment of Hip Disease, St. Bart's Hosp. J., Feb., 1923, p. 10.

BOURNE, GEOFFREY (1963): We Met at Bart's, London. Frederick Muller.

t. Bart's Hosp. J., Power, and R.C.S. 195

I.AMBERT, ROYSTON (1963): Sir John Simon, 1816-1904, and English Social Administration, London, MacGibbon and Kee.

Lee, H. B. (1958): The End of the Alexandra Hospital, St. Bart's Hosp. J., Jan., 1958, p. 10.

NASH. D. F. E. (1956): Ileal Loop Bladder in

Congenital Spinal Palsy. Brit.J. Urol, 28, p. 387. Plar's Lives of the Fellows of the Royal College of Surgeons of England. Revised by Sir D'Arcy Power with the assistance of W. G. Spencer and G. E. Gask, 2 vols., London, for R.C.S., 1930; Lives of the Fellows of the Royal College of Surgeons of England, 1930-1951. By Sir D'Arcy Power, and continued by W. K. LeFanu, London, R.C.S., 1953. (For biographical information on Sir Girling Ball, R. C. Elmslie, Sir Henry Gauvain and Howard Marsh).

Behind the Scenes VII: The Department of Archives

By Nelly J. M. Kerling, Archivist

THE Governors of the hospital have always been greatly interested in the hospital's muniments. Already in the Book of Orders of 1552 it was laid down that a box should be provided for the valuable papers and "the same set in the . . . surest place of the house" No paper or document was ever allowed to be taken out of the building. In 1666 at the time of the Great Fire of London it was considered whether it would be better to remove the money which was in the hospital and "the writeings concerneing the affaires of this Hospitall". It was decided to keep the cash in the building and "that onely such writeings and Bookes might bee removed and putt upp in a trunck that were most usefull and that the same should bee sent to Squire Ridges howse att Hornesey to bee to kept [sic] there for most safty untill the tymes shalbee convenient to returne them back". In 1746 the Governors ordered to have a proper place "safe from fire" built for the records and title deeds. As far back as 1841 the Clerk was instructed to list the contents of deed boxes which he found a difficult task because many of the papers were "from their antiquity very difficult to decipher". Forty years later another Clerk, Mr. Cross, made a rough index of the

contents of the same boxes which is still used for those deeds which have not yet been properly indexed. Mr. Cross had great ambitions for he asked permission not only to catalogue the old deeds of the hospitalof which there are "only" about 2,000—but also to publish the 15th century ledger known as the Cartulary in which most of these deeds are copied out together with letters of protection from Popes and Bishops, and Royal Charters granted to the hospital. As this ledger has 650 folios written on both sides in the fine mediæval handwriting, it is not surprising that his great plans never materialised In 1934 Sir D'Arcy Power, former surgeon of the Hospital, was appointed Honorary Keeper of the Muniments and after his death his assistant. Mrs. Whitteridge became the first part-time archivist. When she resigned in 1962 the Governors decided to appoint a full-time

At present all our archives are kept in different places in the hospital buildings and lack of proper working space makes it very difficult to sort and arrange them efficiently. Fortunately new muniment rooms are being built in the basement of the Clerk's house which will greatly ease the archivist's work.

When these new rooms are finished it will be possible to show some of the hospital's treasures not only to visitors but also to the staff, for at present we can only use the exhibition cases in the Great Hall which hold a limited number of documents.

As far as I know there are two hospitals in England which have appointed a full-time archivist, St. Thomas' and St. Bartholomew's but only at Bart's is the department of Archives an integral part of the hospital's administration. There was a time that archivists were only interested in documents dealing with the past but it is now generally recognised that this is merely a part of their task. An archive of a working institution—such as a hospital should be the place where details can be found of its activities and administration concerning any particular period of its history. Material must always be added to the present collection in such a way that in years to come those who want to know certain facts about our presentday work can obtain at any rate some of this information in the hospital's archives. On purpose I did not write that they can obtain all the information they may want, for as in most archives, it is almost impossible to preserve every paper, ledger, letter, carbon copy, etc., which is produced in a modern administration.

The Medical Records Officer in this hospital is responsible for the patients' notes and all the papers which are filed with them. In smaller hospitals this officer covers nearly the complete administration and any additional papers such as letters or minutes of Board meetings are generally kept by the secretary. St. Bartholomew's hospital is, however, more complicated partly because it is a large hospital and partly because it is an old institution in which tradition plays a great part. It is the task of the archivist to work out a system by which certain papers and ledgers which are not filed with the patients' notes will be preserved in the Archives department and by which others will have to be destroyed. This work must of course be arranged with the help and approval of the heads of departments and in close co-operation with the Medical Records Officer. This in-take of new material into the archives is the last link in the clerical administration of the hospital.

Though the collecting of this modern material and the indexing of it takes considerable time, a 20th century archivist is still responsible for the older books, ledgers and documents. Also in this field the position at Bart's is unique. Unlike St. Thomas' hospital which was closed from 1540 to 1551, Bart's survived the uncertain times of the Reformation. St. Thomas' archives begin in the middle of the 16th century but in this hospital we still have a considerable medieval collection of more than 2,000 property deeds, the oldest one being a grant from our founder Rahere which is dated 1137. From the time of the Reformation onwards we possess the minutes of all the meetings of the Board of Governors and of most of the sub-committees, a great many accounts of the Treasurer, rentals, maps and tenancy agreements. The care for the old parchment and seals, for the maps and drawings, the indexing of the Governors' minute books and other ledgers is a never ending task of the archivist. Medical records such as patients' registers, old case books from 1826 to 1922 when the present system started, have to be registered and numbered.

Yet remembering the need for research in the future and looking into the past are not the only duties of the modern archivist. Not only the staff but also outsiders want to know details of the hospital's interesting history and queries have to be answered, sometimes in great detail. Being much interested in our treasures, the Governors wish it to be known more widely that we possess such valuable historical material and the archivist is expected to write articles on different subjects, to lecture to visiting groups or to societies outside this hospital and to arrange exhibitions in the Great Hall.

The function of hospital archivist is a comparatively new one. It is a post which demands attention and often initiative in different directions and it certainly has all the attractions of working in unexplored fields.

A YEAR IN SOUTHERN RHODESIA

By George Gardos

I spent a most enjoyable year as houseman in neurology and neurosurgery at the Salisbury European and African hospitals, having a very good opportunity to meet the local problems which arise in the practice of medicine.

There is no National Health Service in Southern Rhodesia. Medical services are paid for by the individual or by Medical Aid Societies. The Government provides free medical care to pensioners, Army and Police personnel and to all Africans through Government Hospitals and medical officers. This leaves a fair number of Europeans who are not covered and are unable or unwilling to meet their medical bills. They get away with it, for doctors have a habit of first treating their patients and only then asking questions. I found it astonishing just how much paper-work was involved in the running of even a quiet one-man practice in Rhodesia. The National Health Service is often criticized for having increased the unnecessary paper-work and for keeping too many administrators. Yet, in Salisbury, no general practitioner can function without one full-time secretary, while specialists usually employ a typist and a secretary. National Health paper-work is at times useful, because statistical data are readily available, whereas in Salisbury it is quite hopeless even to attempt to get any statistical information, except from individual practices.

The European Hospital serves the 90,000 whites in Salisbury, as well as a vast area of farmland around it. The specialised units receive patients from all parts of the former Federation of Rhodesia and Nyasaland, and from Mozambique. The hospital is well equipped, yet it gives one the impression of a huge nursing home. The S.R. Government is responsible for all hospital services, it appoints honorary consultants, and gives them, and to some G.Ps. the privilege of treating their private patients in hospital. I found the absence of resident hospital staff very strange at first. What if there is an emergency? The Casualty Officer is always around, and doctors who are in charge of in-patients, leave a telephone number and could reach the hospital by

car in 5-10 minutes from anywhere, Salisbury being one of the few cities in the world that has no traffic problems. This time is often shorter than the time a sleepy houseman takes trudging from his cottage through the hospital grounds to the ward, as I well know from bitter personal experience.

The nursing staff get utterly confused, because there are a dozen physicians treating the patients in their ward in as many different ways. The more sophisticated nurses become impressed with the fact that so many totally different treatments of a condition produce the same result. The European hospital is a training school for nurses. By and large they have an easier time than Bart's nurses. One morning I saw a probationer standing in the middle of the ward deeply absorbed in "Playboy". (I have often wondered how Bart's nurses manage to look frightfully busy all the time, whether they have three or 30 patients in the ward to look after). The Salisbury trained nurses are reinforced by "Sunshine Girls". They are S.R.N's. from Britain who go out to Rhodesia, mainly for the sunshine. Once the craving for sun-tan has been satisfied, they either go home, or become farmers' wives. Lately Central African Airways have enticed a few of them to become air hostesses.

The number of operations carried out at the European hospital is surprisingly large. I estimated that for every one acutely inflamed appendix there are about eight "lily-white" ones removed. Before jumping to a rash conclusion one ought to consider the problem facing the surgeon. The patient is often a farmer living 100-200 miles away. If his acute RIF pain is treated conservatively he will recover and return home. But the danger of a renewed attack is ever present and many hours may elapse before the patient reaches hospital, sometimes in a critical condition. Just one terrible experience can make a surgeon knife-happy in

these cases.

The pattern of diseases is different from that found in Britain. On the whole Europeans lead an active, healthy life, and even some patients look a picture of health. Bronchitis is almost non-existent, and I cannot recall

hearing anyone cough during my stay in Rhodesia (admittedly I have not visited the TB sanatorium). Tropical diseases do occur. There are swampy areas where the tse-tse fly is still to be reckoned with. Malaria does occur, usually as a flare-up of previous infection. The biggest problem is Bilharzia (Schistosomiasis). Infection is acquired by swimming in contaminated lakes and rivers. Europeans become infected when they are too young to realize how difficult it is to eradicate the disease and how unpleasant the treatment. Africans either do not know or do not care. Orthopædic conditions, such as prolapsed disks abound, possibly due to the lot of games played. Parkinson's Law holds true: the number of orthopædic conditions expands to keep all the surgeons in town busy.

In neuro-surgery the pattern for European patients has no unusual features, except that conditions seem to come in runs, as if cerebral tumour or aneurysm were infectious diseases. This is a common observation that never has any statistical basis. Among our African patients traumatic conditions (depressed fractures of skull, subdural hæmatomata, traumatic paraplegia) were common. Some trivial reason, like supporting a different party or the same

girl-friend, or, just an argument when drunk, will make the African angry to the extent of hitting, or worse still, stabbing someone. Nontraumatic neuro-surgical conditions occur in Africans probably with the same frequency as in Europe. In addition I met a number of cases of advanced spinal tuberculosis with abscess formation, and tuberculomata of the brain and spinal cord. I saw many babies with hydrocephalus; advice is very often sought too late. All African hospitals are overpopulated and under-staffed at the moment. The main problem is lack of money and the reluctance of doctors to go to work in Rhodesia.

I hope that this beautiful country will develop into a happy, multiracial society that will attract many doctors from Britain. Helped by a grant from the British Government the Medical School of the University College of Southern Rhodesia is slowly expanding. I am certain that it will become a centre for medical research for it has the clinical material that few places in the world have. If I were to qualify now, I would take the first plane to Rhodesia (the S.R. Government pays the fare) and do my H.S. job at the Harare African hospital, the experience could not be surpassed anywhere.

Rhodesia Ministry of Health Pre-Registration Appointments as Junior Resident Medical Officers

In the last few years, representatives of many United Kingdom and Irish Medical Schools have served their pre-registration year in Rhodesian Government Hospitals, and we would welcome further applications for pre-registration appointments at the following hospitals:—

Harare Central Hospital, Salisbury (720 beds). Mpilo Central Hospital, Bulawayo (800 beds).

These appointments offer:-

GOOD salaries—£80 per month, less £17 per month for board and lodging.

RETURN air fares paid.

EXCELLENT climate, good sporting facilities.

OPPORTUNITIES for Senior House Officer (£120 per month) or Government Medical Officer (£2,000 per annum gross starting emoluments) appointments on full registration.

Application forms and further details from-

The Public Service Attache, Rhodesia House, 429 Strand, LONDON, W.C.2

AROUND AND ABOUT:

8-From Cheapside to The Tower

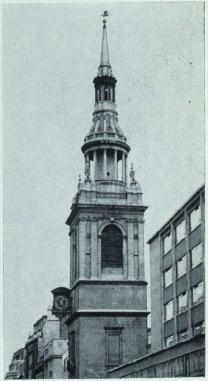
by "Argus"

"It was a pleasant sight to see the City from one end to the other with a glory about it"
—Samuel Pepys.

ONDON is essentially a commercial city and its merchants and business men have little time for town planning and grand architectural ventures. They have made the City what it is, an extraordinary assortment of varying styles and it is this assortment combined with a strong sense of history that is the secret of London's attractiveness. Commerce lends itself to dullness as well as dynamism and Cheapside shows this most clearly. One of London's major commercial streets with a rich and varied history, it contains hardly a single building of note in its entire length. War time bombing erased heavy Victorian buildings but these have been replaced by even more nondescript modern blocks. Widening the street has however revealed the tower of St. Mary-le-Bow which now forms an attractive focal point in this otherwise uninteresting thoroughfare. Once again it is the side streets that reveal the old and the unusual. On the corner of Cheapside and Foster Lane is St. Vedast's Church with its graceful spire, one of the fifty odd churches designed or rebuilt by Sir Christopher Wren after the Great Fire. Badly damaged in the war it has been restored and contains a handsome carved altar piece. A little way down is No. 5 Foster Lane, which was the original home and place of business of "Anthony Chuzzlewit and Son, Manchester merchants" in Dickens' novel Martin Chuzzlewit. In Priest's Court adjoining is the side door of the house from which Jonas departed on his mission of murder. At the top of Foster Lane is Goldsmith's Hall, a dignified Baroque building completed in 1835 by Philip Hardwick (designer of the Great Hall at Euston). Turning into Gresham Street lined by stark new office blocks, Wood Street is passed on the right. At the junction of this street with Cheapside is the famous plane tree mentioned by Leigh Hunt in "The Town" written in 1835. The tree must have been old even then. Clauses in the leases of the surrounding property prevent its being destroyed. Back in Gresham Street adjoining the Guildhall is the restored church

of St. Lawrence Jewry, one of the finest of all Wren's City churches with its elegantly decorated scrolled and panelled ceiling and finely carved woodwork. It is here that the Lord Mayor and City Council attend worship on the day the new Lord Mayor is elected.

The Guildhall which, like the Church, was badly damaged in the war and has only recently been restored, dates from 1420 and



Wren's finest steeple

although extensively rebuilt over the centuries retains some of the magnificence of its original conception. Only the porch, some of the main Hall and the crypt remain of the original 'fayre and goodly house'. It was in the hall that Lady Jane Grey was tried and also the notorious Dr. Roderigo Lopez, subject of an article in last month's Journal. The Guildhall was damaged in the Great Fire and subsequently rebuilt, but the present front is the work of George Dance and was completed in 1788. It is a striking and exotic mixture of Classic and Gothic styles. The setting of the Guildhall in its quiet forecourt is informal and intimate in the best London tradition.

Ironmonger Lane leads off Gresham Street, its name, as of other streets in the area, Milk Street, Bread Street, Wood Street, recalling the trades carried on there in times gone by. A solitary 18th century house (No. 11) survives, as does the tower of the church of St. Olave's Jewry pulled down more than seventy years ago. Walking along St. Olave's Court, Old Jewry, is reached; this was the Jewish Centre of the City in Mediæval times. Here is a quiet oasis in the surrounding City bustle, Fredericks Place. It is extraordinary that this charming little close with its Georgian Houses built by the Adam brothers should have managed to survive at all.

In Cheapside again, return to St. Mary-le-Bow whose steeple is surely the proudest and finest of all Wren's steeples and contains the famous bells, to be born within the sound of which is to be a true cockney. The church which dates from 1680 although it stands on an 11th century crypt, has only recently been restored. An odd feature of the beautiful interior is that the heads of the present vicar and the stonemasons' who restored the church are carved into the keystone of the arches of the nave. Behind the church is an old fashioned city lane-Bow Lane. The little courts that run off it are typical of the Cityan odd mixture of shops, warehouses and offices, some of these with mirrors suspended outside the windows to reflect the light into their interiors. Even taverns, Williamsons' for instance, are hidden away behind the street facades. On the corner of Watling Street the "Old Watling" tavern is an early 18th century building. At the end of Bow Lane stands St. Mary Aldermary. This is an unusual Wren church in Gothic style. Part of the tower dates from before the Great Fire. The interior reproduces the normal perpendicular form, but the elaborately fan vaulted ceiling is most original. Wren has obviously had great fun with this design.

Walk now along Queen Victoria Street to Bucklersbury. This leads into Walbrook. In Walbrook is St. Stephen's church of which is written, "never was so sweet a kernel in so rough a shell". The exterior is indeed rather unprepossessing but the interior is often considered the most majestic of all Wren's City Churches. The design was probably an experiment that was to bear fruit in the building of St. Paul's Cathedral. The best view of the interior is obtained from the North-west corner where all the delicate pillars that support the domed roof and the inset corners can be seen. The integration of cross, dome and rectangle into one design is cleverly done. On the north wall is a tablet of interest to medical men, to Nathaniel Hodges who wrote a book on the plague and was a member of the Royal College of Physicians. He died in poverty as a debtor in Ludgate prison in 1688.

At the bottom of Walbrook is Cannon Street. Walking east, Lawrence Pountney Hill is reached. Here in Nos. 1 and 2 are the finest surviving Queen Anne houses in the City, if not in London. The elaborately carved door hoods attract the eye and the restraint and good taste of 18th century housing are seen

to their greatest advantage. Return to the Bank via St. Swithin's Lane. Continue past the grimy columns of the Royal Exchange up Cornhill till Ball Court is reached. The Court opens into a vard with an 18th century inn at its end (Simpson's Chop House). The yard continues into Castle Court and here is the famous tavern "The George and Vulture" with its ground floor chop room that has hardly changed since Dickens' day. Dickens described the "George" in the Pickwick Papers and the room where Mr. Pickwick is said to have stayed is still pointed out to visitors. In St. Michael's Alley is the Jamaica Wine House which stands on the site of the first coffee house in London opened in 1652. At the end of the Alley is St. Michael's, a much restored Wren church. The interior is rather dark but contains an interesting poor box. Further down Cornhill is St. Peter's church. The closeness to one another of the City churches seems strange today but is a reflection of the dense population of the old City and churchgoing habits in pre-reformation times. The interior of St. Peter's contains an elaborately carved chancel screen—a rarity in Wren churches. The most attractive feature is the monument with cherub's heads, inscribed to



Lawrence Pountney Hill

"The Whole Offspring of James and Mary Woodmason in the same awful Moment of the 18th January 1782 Translated by sudden and irresistible Flames In the late Mansion of their sorrowing Parents from the Sleep of Innocence to Eternal Bliss. Their remains collected from the Ruins are here combined. A Sympathising Friend of the bereaved Parents their companion through the Night of the 18th of January In a Scene of Distress beyond the Powers of Language, perhaps of Imagination! Devotes this spontaneous Tribute of the Feelings of his Mind to the Memory of Innocence. J.H.C."

Leaving the church walk down Gracechurch Street and turn left into Fenchurch Street. A few yards down on the right is Rood Lane at the end of which is St. Margaret Pattens. Within the framework of a basically classic or baroque style, Wren's genius was able to create infinitely subtle and pleasing variations

and these are to be found in St. Margaret's no less than in the other Wreu churches. The spire is polygonal and almost mediæval in style and playfully decorated with needle-shaped pinnacles. Adjoining the church is a simple well proportioned early Victorian house with an original shop front. Contrast this with the extraordinary building (No. 33), almost opposite Lovat Lane (a delightful narrow, winding and somewhat odorous passage leading to Billingsgate). Here is Victorian Gothic gone mad, a mass of gables, pillars and "twiddly" decorations

Eastcheap runs into Byward Street and off this is Seething Lane (by the Underground station). At the end of the Lane is the extraordinary gateway of the ruined church of St. Olave (Pepys' Church). This gate was one of Dickens' favourite "oddities"—"one of my best beloved churchvards I call the churchvard of St. Ghastly Grim. It is a small churchyard. with a ferocious strong iron spiked gate, like a gaol. This gate is ornamented with skulls and crossbones, larger than the life, wrought in stone; but it likewise came into the mind of St. Ghastly Grim, that to stick iron spikes a-top of the stone skulls, as though they were impaled, would be a pleasant device. Therefore the skulls grin aloft, horribly thrust through and through with iron spears. Hence there is the attraction of repulsion for me in St. Ghastly Grim". The odd design of the gate was probably inspired by the burial in the churchyard of many of the victims of the Great Plague of 1665. From Muscovy Street it is only a short way to the end of the walk at Trinity Square where the dignified Georgian front of Trinity House, built by Samuel Wyatt in 1794, looks out across the Green to the forbidding exterior of the Tower.

This is the last article in the series. I fear I have overburdened my descriptions with too much history and architecture and described the City's character too little. Character is something you can sense better than describe, but I hope I have managed to interest at least a few people in the City and its buildings. London is not dull but fascinating if only you will look around you.

THE SEARCH FOR OLD DRUGS IN BRITISH GUIANA

Part II

By D. P. Moody

Kenaima

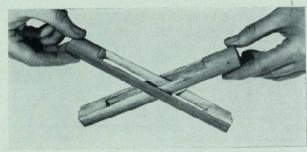
It is difficult to pin down the precise nature of the amerindians' belief in spirits. Much gets lost in translation and there is a great tendency in this process to convert from the abstract to the concrete. The amerindians certainly do not believe that every eagle is an embodied spirit and neither do they seem to believe in a single disembodied eagle spirit. They seem rather to have an abstract notion of 'eagleness' and visualise any one eagle as having some of this quality and, moreover, having it in various amounts from time to time. Further, any one eagle can be used as a communication channel to the whole quality or essence. Perhaps the nearest approximation in our terms would be the Jungian idea of a racial unconscious to which the individual has more or less access depending on the situation. There are some qualities, though, which are not attached to any particular species of animal but which play a great part in the amerindian's thinking. The most outstanding is evil or badness and this is referred to as kenaima.

Very experienced specialists in amerindian anthropology are still not sure whether kenaima is a person liable to be or actually imbued with evil, or a disembodied evil spirit, or both at different times. Illness is considered to be the

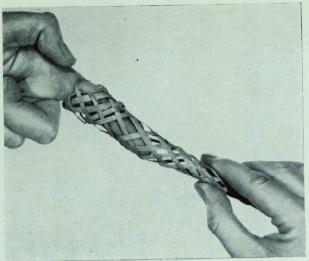
result of attack by kenaima and must be fought at the spirit level. The most fearsome thing to many amerindians is to be attacked by kenaima when alone or otherwise unable to summon the help of the spirits. Tales of the types of death inflicted by kenaima are gruesome in the extreme and often have embellishments reminiscent of the Middle Ages or the Inquisition. It is therefore virtually impossible to get

an amerindian to travel alone at night and it is not much easier in the day. However, such travel is sometimes unavoidable and the people have devised methods of delaying kenaima attacks in order to give themselves a chance of reaching a piaiman. Two of the favourite methods are the puzzles shown in the photographs.

On first getting the feeling that a kenaima is after him an amerindian will make for the nearest village. If kenaima is gaining ground too fast the person lops off an ité frond by the track and whittles out the stem as he runs. A quick manipulation produces the interlocked wooden links which are thrown down on the trail. Kenaima comes along and stops to investigate, fearing a trap, and then becomes fascinated with the problem of how the thing is made. By the time kenaima remembers his quarry a lot of ground has been lost. Again the chase is taken up and the amerindian has to make and throw down the second puzzle. It is immediately obvious to kenaima how this one is made but time will be wasted in checking this in case of a bluff. Since the thing itself is really easy to understand kenaima will next wonder what it is for. In the course of this the gadget will be explored manually until the position shown in the photograph is reached, when kenaima will



First kenaima puzzle



Second kenaima puzzle (finger trap).

find that a simple pull will not get the gadget off the finger. Further time is lost finding the way out of the trap and by this time the amerindian should have made the home base. This sequence is strongly reminiscent of the equally naive story of the golden apples of classical times but is made more amusing, to me, by the use of both bluff and double bluff. Many of the stories told about other subjects, while a group swing quietly in their hammocks in the evening, have this same mixture of naivety and cunning and the storyteller who can produce a particularly ingenious combination is a highly valued member of the

The Piaiman.

The tribe accords no special recognition or status to the piaiman himself in virtue of his special function. On any subject other than piai he gives his opinion as merely another ordinary amerindian. Even in medical and sociological matters this valuation of his personal opinion still applies. His only special ability is that of acting as a channel for communication with the spirits. He may do this privately or hold public seances, depending on who is paying for the service. His reputation depends on the efficacy of the advice

he secures as judged by the proportion of cures obtained. His standard of living also depends on the same thing since he acts as a private practitioner in demanding fees, and since he will not have the time to keep as big a food garden as other people. I was generally impressed by the high standard of intelligence and reasonableness of the piaimen but perhaps this is only to be expected when one realises that until recently there was absolutely no other form of specialist activity or profession available to the bright boy of the village.

The training of a piaiman used to be long and arduous. After many years of sitting at the feet of a very senior practitioner, the young man would be sent

on a journey round the neighbouring piaimen both to learn and to be examined. On arriving back at his teacher's house accompanied by sufficiently good reports he would hold his first public seance. Success in this would be followed by a move to one of the villages without a piaimen. Since the piaimen formed a fraternity whose only saleable assets were their reputations and wits, they tended to be hard on the failures and the consistently poor practitioners. In fact, in accord with tradition elsewhere, they tended to bury their mistakes. The positive incentive to get results was reflected in the habit of the successful practitioners of taking a sabbatical year or so occasionally and using it to tour neighbouring practices, particularly those of other tribes. Much of this loose organisation has been repressed by priests and government, but since they offer nothing in its place it merely tends to go underground. This has caused a lowering of the standard in the "trade" and a separation of the practice into two streams.

On the whole, the piaimen will tell what they know about dysentery, sore eyes, fever, and the like to the few people that they trust. Social dynamite like things affecting mental states or sex is only made manifest by the united smooth front put up whenever conversation

drifts in this direction. Materials used in ritual killings come in the same class but with luck and a lot of trust one can find a few cracks in the front leading eventually even to these. One can sympathise with this when people doing what they regard as a desperately necessary anti-starvation measure find themselves guilty of a hanging offence in the legal code administered by their government. Furthermore, they find themselves being left to starve if they do not act. My sympathies are also with the amerindians when I see an american missionary cramming himself with vitamin pills before going out to preach against the evil of drinking cassiri. Cassiri is a weak liquor indeed so the demon alcohol is unlikely to do much damage. More to the point is the loss of vitamins which can be obtained in no other way at some seasons of the year. I was and am still unable to understand these missionaries. Their interpretation of the Christian ethic seems to imply that a lingering death from disease imposed on nutritional deficiency is preferable to the effects of a mild

Since it seems that under present conditions piai cannot be beaten it would be advisable to consider joining it. The proposition that the piaimen should be integrated with the government medical services after taking suitable courses was met with a horrified refusal. "After all, old boy, it would be unethical to associate with unqualified practitioners" was the comment of one man. He was a graduate from a London medical school and was perfectly well aware that the total medical care allocated to the amerindians was about twothirds of the time of one "qualified" doctor. In that time the "amerindian doctor" had to cope with about 30,000 people in 78,000 square miles of rough going. The attitude of the piaimen themselves was a startling contrast. They were asked if they would be willing to give up about three months per year for three years to taking a course in orthodox medicine so that they could become medical rangers. They would be expected to agree to replace any of their own methods by any better ones that they were taught. Most were willing to start the same day. When it was pointed out that they would get no pay for attending the course and very little in the way of a retainer afterwards they countered with the remark that they were paid by results. When pressed they amplified what they thought was self-evident by stating that more knowledge meant more

cures, more reputation, and more income, Further, there was plenty of kenaima about with which they currently had little success, and since this was presumably white kenaima then knowledge of white piai was a good thing. The final objection to the idea by our orthodox friend was given in all seriousness. It was a reluctance to accept into any kind of qualifying course, even for auxiliaries, anyone who had not reached an adequate educational standard as shown by passes in the local equivalent of our "O" level examinations. One particular case quoted was of a girl who wanted to become a nurse even to the extent of leaving her tribe to go to the capital to study. She got herself enough of an education to take all of the examinations and only failed one general knowledge paper. This paper included questions such as naming the mayor of the second largest town in the country. She did not get into nursing school and the fact that she was fluent in three European and two amerindian languages was brushed aside as irrelevant in an estimate of her standard of education and intelligence.

Plant Collecting.

On arrival at a piaiman's house we would have some cassiri and discuss the deal. If it was on we would all adjourn to the garden where the medicinal plants would be growing inconspicuously amongst the corn and cane. Each plant would have its story told in terms of its own particular essential qualities or spirit and hence the type of kenaima it could overcome. No objection was raised to photographing the plants but it always took a long time to deal with the question of collecting samples for botanical identification and, if enough could be spared, for brief pharmacological testing. The piaimen could convince the plant spirits quite quickly that my wife and I were good piai and therefore suitably responsible people with whom to travel. The problem was that these spirits had never been out of sight of land before and needed a lot of reassurance before allowing themselves to be taken on a three week voyage. However ridiculous this may sound to us it was clearly a matter of great moment to the piaimen as one incident showed. After talking to one plant spirit for over an hour in blazing sunshine one piaiman solemnly announced that he was quite convinced that we would look after the plants aboard ship but he was unable to convince the spirit of this. He equally solemnly accepted

our suggestions of getting other piaimen to help and also of asking the assistance of other plant spirits who had agreed to come. Once the party had assembled it only took another twenty minutes to complete the job.

Another incident on the same day dispelled any notion that this piaiman was stupid or unsophisticated. We started discussing a woman in the village whose husband had approached me as I rode in the previous evening. His wife was bleeding badly and he wanted me to cure her because he loved her very much. I had no medicines but went to see her. She should clearly have been in her hammock but she had just been kicked out to do the cooking. The husband was quite offended by the idea of letting her rest while he did the work and adamantly refused to act upon it. The piaiman shrewdly remarked that the husband had put off approaching him because he knew I was to arrive and hoped to save the fee. Further, if asked he would give the husband the same advice as I had and he would expect it to get the same treatment. Nevertheless the husband would eventually come to him to get the help of the spirits in driving away the kenaima and he had taken the trouble of consulting in a preliminary way certain plant spirits who had previously been helpful in similar cases. When the time came for the final discussion they would almost certainly continue to agree with both of us about the need for rest and would add that the woman would have to eat some of their substance. I pointed out that he could hardly stay in the house all day to see that the instructions were carried out and he could not trust the husband to do so. He grinned and said that the problem had occurred before and had a very simple solution. While in the house he would make an eagle call and his pet eagle would plummet out of the sky, fly into the house, and perch on his shoulder. He would discuss the case with the eagle in front of the husband who would be instructed that the high-flying eagle spirit would see any evasion of duty and would dive down to carry him away.

All of this made sense of the eagle chicks wandering around and getting free feed but left one wondering just what the piaiman himself believed. "The husband believes" was his reply when taxed on this point.

(To be continued)

STUDENTS, HOSPITALS AND PRIZES IN THE NINETEENTH CENTURY

by Walter Radcliffe

Some years ago I discovered a copy of Robert Ferguson's "Essays on the Diseases of Women, Part I, Puerperal Fever", dated 1839 on a second-hand bookstall. The book itself is neither valuable nor important, but I bought it because it was bound in blue leather and stamped on the cover with the hospital coat of arms, and inside the cover was pasted a certificate stating that it had been presented in 1847 to Mr. A. D. Dunstan by Edwd. Rigby, M.D., as a midwifery prize, and signed by ten members of the staff of the hospital, including William Baly, William Lawrence, James Paget and Edward Stanley.

More recently I was browsing through some early copies of the "Lancet" in the Colchester Medical Society's library, and came across a very caustic diatribe by the famous editor of that journal. Thomas Wakley, in the first number for 1835, in which he castigates the hospital for issuing prizes to its students as an inducement to attend lectures. To understand the

reason for this outburst, it is necessary to appreciate the fact that up to about that date medical students were taught by the system of apprenticeship to a practising general practitioner. Under this system, which lasted until the Medical Act was passed in 1858, an apprentice was bound for seven years to serve his master, who provided him with food, clothing and pocket money for a fee ranging from £100 up to five times that sum if the master was surgeon to a London hospital. At the end of that time he sat for his qualifying examination, either with the Society of Apothecaries or the new Royal College of Surgeons, and if successful gained his diploma.

The cause of Wakley's campaign on behalf of the medical students was that the examining bodies had begun to insist on a certificate of attendance at lectures before accepting a candidate. The "Lancet" at the beginning of each year listed all the courses of lectures available in London, with the schedule of fees. It was

not only the cost of these lectures which came hard on the apprentices from the country, who were already bound to serve their masters, but that they had to find the cost of living in London to enable them to attend the courses. In addition to some ten or eleven teaching hospitals, there were listed seven medical schools not attached to teaching hospitals, including the one in Windmill Street, which had been founded by the Hunter brothers, and another in the "borough" of Southwark, which was almost as famous. Near to Bart's there was a private school in Bartholomew Close, and another in Aldersgate Street. There were also a number of private tutors, who gave lectures in their own houses. Wakley accused all these lecturers of extorting large fees from the apprentices, who had already learned their professional skill from their own masters.

"Why is the knowledge which the country surgeon communicates to his pupil, treated as nought by the extortioners of our colleges and companies? It is one of the grossest insults that was ever offered to a body of educated men.

'Oh, but there are prizes given in the schools! Look,' some blockhead may exclaim, 'at the splendid announcement of prizes which has just been made in the prospectus of the St. Bartholomew's school! Bah! It is all humbug and quackery, and the lecturers know it. When are the prizes awarded? Certain enough, at the end of every session, when the last shilling has been extorted from the pockets of the student! And of what do the prizes consist? Why, of Books, written we suppose by the Stanleys, the Earles, the Vincents, and geniuses of that class. If anything could display effectually the monstrous character of this prize farce, which has just been got up as the new catch-fee of the day, it might be seen in this fact that out of the class which attends St. Bartholomew's Hospital, not less than thirtyseven students-thirty-seven! - obtained at one examination "prizes" and "certificates of honour;" and, to complete the picture of absurdity, the distinctions were distributed by that knowing man Matthew Pryme Lucas, Esquire, Alderman of the City of Londona somewhat better judge, we take it, of turtle, than of the quality of medical attainments."

than of the quality of medical attainments." This is only a small part, about one quarter, of Wakley's editorial, but will suffice as an example of his scurrilous style. It is not surprising that he made himself very unpopular with such men as John Abernethy, and James Blundell of Guy's, whose lectures he reported in full by sending a reporter in the guise of a medical student to take them down.

Apart from being one of these prizes stigmatised by Wakley as "bait", my copy is interesting in that it was presented by Edward Rigby. and it seems to me to be rather a surprising choice for him to have made. Ferguson's book. which was then eight years old, added very little, if anything, to the knowledge of the causes of puerperal fever, and he stated-in a footnote—that he did not regard the disease as contagious. But Rigby had been teaching his students at Bart's that it was a contagious disease at least as early as 1841, when his book on midwifery had been published. In that book he clearly stated that he disagreed with many of the views put forward by Ferguson. He referred to the conditions at the great Allgemeines Krankenhaus in Vienna, where it had been shown that infection was spread not only by sponges used to wash the patients, but also by soiled linen. It was in this hospital that Semmelweis was later to prove the carriage of infection from the mortuary to the wards, and to reduce it by making the students wash with chloride of lime. In his classic study of the disease, first written in 1843, Oliver Wendell Holmes referred to the work of Rigby in the first paragraph.

Edward Rigby, junior, had been lecturer on midwifery at St. Thomas's Hospital before coming to Bart's. He translated Naegele's great work on the mechanism of parturition into English in 1830, and he also edited William Hunter's Anatomy of the Gravid Uterus. In addition to being an F.R.C.P. Lond. he was a fellow of similar colleges in Vienna. Berlin and Sweden. His father was Edward Rigby of Norwich, who made a name for himself by his study on "Uterine Haemorrhage" in 1775, in which he distinguished between the two kinds of ante-partum bleeding, accidental and unavoidable. Rigby senior became Lord Mayor of Norwich the year after Edward junior was born, and had twelve children, completing this large family with the addition of quadruplets in his seventieth year. He did not take his M.D. degree until he was 67, and lived to the age of 74.

REFERENCES

Essay on the most important Diseases of Women, Part 1, Puerperal Fever, by Robert Ferguson, 1839.

A System of Midwifery, by Edward Rigby, 1844. Classics of Medicine and Surgery, by C. N. B. Camac. Reprint of Oliver Wendell Holmes' Essay on "The contagiousness of Puerperal Fever," 1959. Notes on Edward Rigby kindly supplied by Mr. J. L.

The "Lancet" for 1835 and 1837, 1931,

Selected writings, by Sir D'Arcy Power. On the centenary of the Royal College of Surgeons.

AN INTERESTING OBSTETRICAL HISTORY

By N. C. G. Richards

Hospital: Memorial Hospital, Peterborough. Consultant: Mr. Kimbell.

Mrs. B., aged thirty-four years was admitted to the hospital 26 weeks pregnant, suffering from pre-eclamptic toxæmia, diabetes mellitus and essential hypertension. Her blood group was O rhesus negative, and her past history showed no evidence of rhesus antibodies. She had had one full term normal delivery, and two Caesarian sections.

Past Obstetric History

In September 1957, Mrs B. gave birth to a 5 lb. 5 oz. male infant, following an uneventful pregnancy, except for slight pre-eclamptic toxemia. There was no trace of glycosuria at this time.

In September 1959 a 36 week 6 lb. 2 oz. female infant was delivered under Lower Segment Cæsarian Section. Mrs. B. was given a blood transfusion at the time of operation. During this pregnancy she had developed diabetes mellitus, and when approximately 7 months pregnant her Fasting blood sugar was 150 mgm.%, rising to 270 mgm.% after a normal midday meal.

In November 1961 Mrs. B. was again delivered under Lower Segment Caesarian Section of a 4 lb. 2 oz. male infant who lived for 8 days only. The Pædiatric Registrar reported that the baby was delivered three weeks before term, due to the diabetic condition of the mother. At birth it was suffering from shock and was slow to respond to resuscitation, requiring intubation and intra-tracheal oxygen.

Examination revealed that the child, though definitely male with well-formed scrotum in which testes were palpable, had no penis and no external urethral opening. This is a rare condition in which the bladder usually opens into the rectum and this was found to be so on post-mortem.

Post-mortem showed both kidneys to be cystic with only a small amount of functioning renal tissue. The right kidney was grossly hydronephrotic with a hydroureter. Death was most probably due to renal failure, as no definite infection was discovered.

Recent History

Up to the 19th February 1964, Mrs. B. had been attending her Physician regularly. He was treating her for diabetes mellitus i.e. an 1800C diet, and 20 units Lente Insulin mané. She was then found to be pregnant, though she maintained that she had adhered rigidly to the dosage of oral contraceptive (Conovid E) as prescribed by her doctor. Pregnancy was 4½ months advanced and the expected date of delivery was July 8th 1964. Her blood sugar was 90 mgm.%, urine showed 1% content of sugar, and her weight was 9 st. 12 lbs.

On March 24th some blood was taken and her Hb was estimated to be 13 G. %, Indirect Coombs Test was 1:10, and Anti-D 1:4. Therefore on April 1st she was admitted to hospital for observation, being 26 weeks preg-

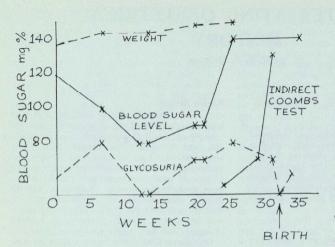
On Admission her general condition was satisfactory. Breasts were active, heart N.A.D., B.P. 190/110, lungs clear, no vaginal discharge was present, and only a small erosion of the cervix. Weight was 10 st., Height 4 ft. 10 ins., shoe size 3½, and height of the fundus was about 28 weeks.

Owing to some hydramnios there was uncertainty as to whether or not it was a breech presentation, and an X-ray taken confirmed this suspicion, showing a single foetus. Other investigations showed urine to contain glucose 1½%, and blood sugar level was 140 mgm.%.

Management

She remained on her 1800 C diet, and 20 units Lente Insulin mané. A regime to combat pre-eclamptic toxæmia was instituted i.e. rest, diet, Saluric tabs one b.d. and Sodium Amytal gr. one t.d.s. Mrs. B. asked if she might rest at home, permission was given and she left with the pregnancy 29 weeks advanced. On leaving hospital the 1.C.T. was 1: 40, but as the baby was so immature it was felt it would be better to re-admit her later when the baby's chances of survival might be better.

On May 7th, now 31 weeks pregnant, the ICT had risen abruptly to 1:160. On May 12th she was re-admitted to the hospital—B.P.



160/100, and complaining of occasional headaches. Urine examination was negative for sugar, albumen and acetone. She was now having 40 units Lente Insulin mané. The following day there was a trace of acetone in the urine, but no sugar, and in view of the forthcoming operation, she commenced Soluble Insulin 12 units at 7 a.m., 11 a.m., 3 p.m. and 7 p.m.

On May 15th it was decided to perform a Lower Uterine Caesarian Section immediately, because of the high Rhesus antibody titre. Her maturity was 32 weeks.

Operation

A pre-medication of Atropine gr. 1/100 was given. Anæsthesia was induced with Thiopentone Sodium and maintained with Nitrous Oxide and Oxygen. A sub-umbilical incision was made. The bladder was found to be adherent to the previous scar, but there were no other abdominal scar adhesions.

Procedure

A live female infant was delivered at 8.55 p.m. The baby was typical of a diabetic mother, being large (6 lb. 7 oz.) and oedematous. The placenta was attached to the anterior uterine wall and had a succenturiate lobe. Blood loss was 15 fl. oz. and she was given two pints of blood for anemia (Hb approx. 70%) in theatre. A half litre of 5% dextrose with 10 units of insulin was given to help maintain her throughout operation.

Post-Operative Management

I/M Omnopon gr. \(\frac{1}{3}\) was given p.r.n. 6-hourly. Continuous bladder drainage via a Foley's catheter was set up for 48 hrs. A second litre of 5% dextrose was administered by slow intravenous route. She was not allowed any food for 24 hours. Urine was tested 4 hourly for sugar and acetone.

May 16th, B.P. 140/85. No bowel sounds were present, and a flatus tube was passed to relieve abdominal distension. She was given 10 units Soluble Insulin q.d.s.

May 20th. The Physician suggested that she should re-commence Lente Insulin

30 units mané. Blood sugar for the previous day was 140 mgm.% (Fasting), with a trace of sugar in the urine. Hb. was 10.2G% and B.P. 130/90.

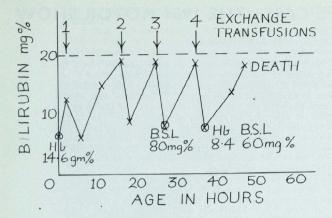
May 22nd. Blood Sugar Estimation: 10 a.m. 305 mgm.%; 12 noon 260 mgm.%; 2 p.m. 262 mgm.%; 4 p.m. 250 mgm.%. She had developed a Proteus urine infection which responded well to treatment.

She made good progress and was discharged on May 25th—Hb. 13G.% B.P. 180/105.

The Baby's Progress

At birth the baby was suffering from a moderate degree of asphyxia, but responded to the usual resuscitative measures. On examination the lungs were fully expanded, the heart showed a soft systolic murmur, the liver was three fingers enlarged and the spleen was just palpable. Cord blood Hb was 14.6 G%, Coombs Test +++, Bilirubin 7 mgm.

Three hours after birth an exchange transfusion was performed due to rising bilirubin level. Three succeeding transfusions were deemed necessary, and her condition was then satisfactory. On May 17th the baby developed a convulsion at 3 p.m. No cause was apparent. Later during the evening, the baby had a series of generalised convulsions and died within 10 minutes. Death was thought to be due to a combination of several factors, as no single explanation seemed satisfactory.



Post-Mortem revealed complete atelectasis of the left lung, auricular-septal defect and generalised jaundice. The liver was large, and the spleen enlarged and soft. The brain was not examined, therefore kernicterus cannot be disregarded.

Conclusion

In this interesting obstetrical case the chances of survival for the mother were good, but for the baby, poor. It is doubtful whether anything further could have been done to help the baby. Diabetes Mellitus, Rhesus Incompatibilty, Toxæmia and Prematurity are all in themselves important causes of perinatal mortality. The foetal mortality rate in cases of Diabetes Mellitus is still 20%, which is very high. This is notable in the last four weeks of pregnancy. and there may be hydramnios and congenital deformities also present. Hydramnios was evident in this instance, and is usually associated with an approximate 20% foetal mortality rate, and is accompanied by such defects as oesophageal atresia, congenital heart disease, talipes and premature labour. With adequate control, the maternal diabetic mortality is less than 1%.

In cases of Rhesus Incompatibility the mortality of new-born infants is higher when clinical signs occur early. This baby was severely affected—its cord bilirubin at birth being 7 mgm.%. rising rapidly. Should the cord blood bilirubin rise above 20% mgm.% there is a danger of brain damage of kernicterus, although 15 mgm.% is probably a better level for premature babies.

A maternal Indirect coombs titre above 1: 40 is associated with a high foetal and neonatal mortality rate; in this instance it was 1:60.

In Pre-eclampsia, which seems to be commonly associated with hydramnios, the foetal mortality is 10-15%. Furthermore there are many deaths in early infancy due to prematurity. For the period 1952-54 the total deaths of mothers caused by pregnancy and childbirth were 1,094, of which 246 or 22% were due to toxamia of pregnancy.

With regard to the mortality rate of those babies born prematurely, this is 62% for those weighing 3½ lbs. or less, which is equivalent to 30 weeks (Queen Charlotte's Hospital), and 63% of all neonatal deaths occur in premature infants, mostly in the first two days of life.

With the limited information available one could conclude that the baby died of a number of factors, all of which were aggravated by a marked degree of prematurity. It is interesting to note that prematurity, diabetes and Caesarian Section are all predisposing factors to idiopathic respiratory distress syndrome of the new-born. It is doubtful whether this baby was so affected as it is rarely confined to one lung.

Discussion

Mrs. B. was fortunate, one feels, to have had so many successful pregnancies. Further confinements are bound to be detrimental to her health. As oral contraceptives seemed to be ineffective, I consider her to be a candidate for sterilisation.

Acknowledgements are due to Mr. Kimbell, Dr. Powell, and many others, who have helped me in the preparation of this case history for the Journal, and also to Miss W. Norton for the layout of the copy.

OTHER PEOPLE'S CARS: THE 1964 MOTOR SHOW

By J. M. Robinson

SUPERFICIALLY this year's Motor Show appeared much like last year's, this however is not surprising as few motor manufacturers could afford a new model every year and a policy of improvement and consolidation is more financially rewarding. B.M.C. seem to have pulled off the surprise of the Show with what in reality is the logical development of the 1100. The synchromesh on first gear was long overdue, and would be welcomed on the new improved Mini. The flashers are arranged to dim when the side lights are switched on; it seems to have taken a long time for this idea to catch on and other manufacturers could well follow suit. Also in the family car range, Fords have fitted a very ingenious fresh air system allowing full ventilation with windows closed, and active participation in competition has paid handsomely in advertising.

In the higher price range Rover's are still well ahead with the 2000 and have set a high standard of engineering, de Dion axles being featured on at least two other cars. For the motorist who wants something rugged, other than a Land Rover, the Russians make the Volga and Moskvitch, sold in this country, rather surprisingly, by Thompson and Taylor of Brooklands who used to maintain and build racing cars. These cars seemed a little more refined than last year but still look pre-war, however a breakdown should be no trouble as the tool kit would put some garages to shame and includes a comprehensive spares department.

People tend to go to the Motor Show to look at the exotic rather than the practical. At the far end of the hall hidden modestly under the stairs were four of the most desirable cars in the world. Ferrari showed the finest of Italian racebred machinery from the 3.9 litre Coupé in dark blue to the blood red, 170 m.p.h. plus, 275/GTG Berlinetta, the personification of Enzo Ferrari's virtual monopoly of sports car racing. Next to them were Maserati with a new 4.1 litre four door tourer surely the world's fastest four door saloon at 140 m.p.h. Alfa Romeo showed their usual range of highly desirable machinery from family saloons to the Zagato bodied TZ, a 1.5 litre car with a top speed of over 140 m.p.h. Last in the line up



Aston Martin DB5, Photograph by courtesy Alan Chadwick and Partners Ltd.

were the Iso Rivoltas, beautiful Italian coachwork coupled with 'hairy' American

British high performance cars were well represented. Morgan continue to produce their very pretty traditional product, the competition version being of particular interest. However their glass fibre aerodynamic car is rather hideous. A.C. showed the results of mating British chassis' and American engines with the Cobra which looked and probably was the fiercest car in the show. Jaguar have answered the American plea for more power by enlarging the 3.8 engine to 4.2 litres; the E type probably still represents best value for money, and is a very valuable source of American dollars. However the car which really upholds British prestige and gives away little or nothing to foreign rivals is the Aston Martin D.B.5. which is making international fame for itself in its current top billing in "Goldfinger" co-starring Sean Connery and Honor Blackman. I'm sure there are few people who do not admire Mr. Bond's taste—in cars that is

In the gallery above the crowds and cars it was possible to inspect the products of the component and accessory manufacturers in comparative comfort. Every year new gadgets and devices are shown—some are gimmicks but many are not, and it is always surprising how long it takes the motor manufacturers to realise the worth of an idea and incorporate it into their designs. Amongst some which might be more widely used are, transistorised ignition, fuel injection for small engines, alternators in place of dynamos, dimming flashers and stop lights, and automatic transmission for family cars. The development which was of the greatest interest however was in the tyre world. In the last couple of years high mu. has transformed wet weather tyre characteristics and Dunlop's development of radial ply tyres in the racing and rally world has now been handed on to the general public in the SP41. The Americans, however are not slow to see a potential market. neither are the continental tyre manufacturers. The first signs of this tyre war were when Firestone and Goodyear started to try to get a foothold in European motor racing. This racing business is no drop in the ocean, Firestone produce 67 different types of racing tyre in the States. For the average motorist all these manufacturers Dunlop, Firestone, Goodyear, Pirelli, Michelin, Avon, produce high mu. and radial ply tyres to choose from, and it seemed significant that the motor manufacturers are no longer patronising one tyre manufacturer as they used to-even Rolls Royce were using Dunlop, Firestone, and Avon on their Show models. Competition in this very important field should yield good dividends, but Dunlop may well have to look to their laurels.

THE WORDS OF DYING MEN

By T. J. Clogger, Security Officer, St. Bartholomew's Hospital, Ex-Detective Superintendent

Since it may become the duty of a doctor, a sister or a nurse at some time or other to listen to statements made by a dying man, it is necessary that hospital staff should know what their duty is in this particular. In cases of homicide or manslaughter, statements made by a person, since deceased, are admissible to prove the cause and circumstances of the man's death. Such statements are called 'dying declarations'. But such statements under English law should be made when the person was in "settled, hopeless expectation of imminent death"—a phrase used by Willes J., in

R. v. Peel 2 F. & F. 21 and quoted with approval by many other judges. The admissibility of a dying declaration rests on the principle that a sense of impending death produces in a man's mind the same feeling as that of a conscientious and virtuous man under oath—Nemo morturus praesumuntur mentiri. 'The general principle on which this species of evidence is admitted is, that they are declarations made in extremity, when the party is at the point of death, and when every hope of this world is gone; when every motive to falsehood is silenced, and the mind is induced

by the most powerful considerations to speak the truth; a situation so solemn and so awful is considered by law as creating an obligation equal to that which is imposed by a positive oath administered in a court of justice'. (Eyre, C. B., R. v. Woodcock (1789) 1 Leach C. C. 500).

The case of R. v. Perry (1909) 2 K.B. 697, P. performed an illegal operation on a woman, as a result of which she had a miscarriage and expired. Two days after the miscarriage, early in the morning, the deceased, in answer to her sister's question, "Maggie, what did you have that woman for?" replied, "Oh, Gert, I shall go. But keep this a secret. Let the worst come to the worst", adding a statement of what the prisoner had done to her. The deceased died the same evening. Lawrence, J., admitted the statements as a dying declaration. On appeal to the Court of Criminal Appeal against a conviction for murder, Lord Alverstone, C. J., said: "in R. v. Peel, supra, Willes, J., said: "It must be proved that the man was dving and there must be a settled hopeless expectation of death in the declarant." "The sentence expresses in very clear and crisp language the rule which I have been trying to explain." In R. v. Gloster, 16 Cox C. C. 471, Charles, J., examining the cases said, 'In the latest case of all, R. v. Osman 15 Cox C. C. 1, Lush, L. J., lays down the principle in these terms: "A dying declaration is admitted in evidence because it is presumed that no person who is immediately going into the presence of his Maker, will do so with a lie on his lips. But the person making the declaration must entertain a settled, hopeless expectation of immediate death. If he thinks he will die tomorrow, it will not do." That is the judgment of Willes, J., with this addition that Lush, J., inserts the word 'immediate' before 'death'. With the greatest deference I would prefer to adopt the language of Willes J., and say that the declarant must be under a 'settled hopeless expectation of death'. 'Immediate death' must be construed in the sense of death impending, not on the instant, but within a very, very short instance indeed. In other words, the test is whether all hope of life has been abandoned so that the person making the declaration thinks that death must follow. I now propose to apply that principle to the present case . . . If the expression "I shall go" is taken alone, it might mean, "I shall die some day"; but, taking into consideration the whole sentence, we concur with Lawrence, J., that the statement was made by the deceased

with the hopeless expectation of death." Appeal dismissed.

Conditions necessary for Reception of Dying Declarations

Before the statement is admitted it must be proved that the person who made it is dead; and the burden of proving death is upon the person who wishes to prove the dying declaration. Dving declarations are admissible only where the death of the deceased is the subject of the charge, and the cause of death the subject of the dving declaration. A dving declaration is not admissible to disprove a fact upon which perjury is assigned (R. v. Mead 2 B. & C. 605). Nor to prove rape (R. v. Newton & Carpenter, 1 F. & F. 641). So upon an indictment for administering savin or using instruments to procure abortion, the woman's dying declarations are not admissible, though they relate to the cause of death (R. v. Hutchinson, 2 B. & C. 608 n.). A dying declaration must be that of a person competent to testify as a witness. Therefore, the dying declarations of lunatics or children of tender age who are incompetent to testify, are not admissible. Thus, the case of R. v. Pike (1829) 3 C. & P. 598 where the prisoner was indicted for the murder of a child aged four years, it was proposed to put in evidence as a dying declaration, what the child said shortly before her death. It was held that it was inadmissible. Park, J., "We allow the declaration of persons in articulo mortis to be given in evidence, if it appears that the person making such declaration was then under the deep impression that he was soon to render an account to his Maker. Now, as this child was but four years old, it is quite impossible that she, however precocious her mind, could have that idea of a future state which is necessary to make such a declaration admissible . . ." Dying declarations in favour of the party charged with the death are admissible in evidence, as they may have an influence on the amount of punishment (R. v. Scaife, 2 M. & Rob. 551). In R. v. Mitchell, 17 Cox 503, it has been laid down by Cave, J., that-"a declaration should be taken down in the exact words which the person who makes it uses, in order that it may be possible from those words to arrive at precisely what the person making the declaration meant. Where a statement is not the ipsissima verba of the person making it, but is composed of a mixture of questions and answers, there are several objections open to its reception in

evidence, which it is desirable should not be open in cases in which the person has no opportunity of cross-examination. In the first place, the questions may be leading questions, and the condition of a person making a dying declaration there is always very great danger of leading questions being answered without their force and effect being fully comprehended."

But a statement made by a person in circumstances which would not render it admissible as a dying declaration becomes admissible as such if subsequently repeated in his presence and at his request by the person to whom it was previously made, and if assented to by him, if at the time of such repetition he was in such a state that if he had then made a statement it would have been admissible as a dying declaration (R. v. Steele, 12 Cox 168) and R. v. Stevens (1904) 4 N. S.W. State Rep. 727, where it was suggested that the judge should examine on the voire dire before admitting such statements.

In the case of R. v. Stephenson (1947) N. J. 110, it was held by the Court of Criminal Appeal for Northern Ireland that the fact that

a dying declaration is made in answer to leading questions is no objection to its admissibility but may affect its weight as evidence and that as there can be no opportunity to test or amplify a dying declaration, the evidence contained in it should be weighed and pondered with special care and attention, and it is the duty of the judge to impress this upon the jury.

Criminal abortion is the cause of many deaths. In such cases if death seems imminent, it is advisable to obtain a dying declaration from the patient, provided there is reason to believe that some outside criminal abortionist is responsible. It will only be admissible after death and should then be placed in the hands of the police without delay, for it may be the first intimation they have of some criminal act. In practice the statement should commence as follows:—

"I.... believing myself to be dying and with no hope of recovery, state as follows" It should, if possible be read back and signed and witnessed.

To all intents and purposes, the law of Scotland is identical with that of England



"AH! MISTER JOHNSON, I DO HOPE I'VE NOT KEPT YOU WAITING TOO LONG"

THE ABERNETHIAN SOCIETY

A REPORT OF RECENT MEETINGS

by Fiona McCarthy

Tuesday, October 20th

Clinical Evening with Guy's Hospital Pupils'

Physical Society.

About a dozen Bart's stalwarts attended this joint meeting with Guy's. In the first part of the evening several patients with various physical signs and varying coherent histories were available as a trial in practical diagnosis. After supper, the official diagnoses were revealed and discussed. Then two case histories were presented for diagnosis; on our side, by M. Lipsedge and M. Casewell. Both cases gave rise to interesting and informative discussion.

We are grateful to Guy's Pupils' Physical Society for an evening which showed how much students can learn from one another outside formal teaching.

Thursday, October 22nd Dr. H. Wykeham Balme, M.D., F.R.C.P.

Or. Balme, fully up to the expectations of the large audience, spoke wittily and without bias, if somewhat prejoratively, on the relative merits of general practice and specialisation. He endeavoured to remove some common misconceptions about specialists; for instance, that they are clever, hard working, thorough, or even usually right. The G.P., on the other hand, is not so lazy, incompetent or unnecessary as is sometimes alleged.

Today, under the N.H.S., the specialist is in a favourable financial position, having premises, equipment and locums paid for; while the G.P. has a disincentive to provide better facilities and services for his patients, since the money comes out of his own earnings.

Dr. Balme was optimistic about the future. He estimates that there will soon be a considerable shortage of both specialists and G.P.s, so that the increased bargaining power will improve their conditions of work. Meanwhile he thought that those who wish to enter general practice should do more than the statutory post-graduate hospital work, and that aspirant specialists should spend some time in general practice.

Finally Dr. Balme suggested that the choice was largely a matter of temperament, and that general practice should not be regarded as 'second best' to specialisation but as an equally worthwhile and important pursuit.

Thursday, October 29th
Mr. Glanville Williams, F.B.A.
Reader in English Law,
University of Cambridge
"Law and Ethics in Medical Practice"

Mr. Glanville Williams gave a brief outline of the legal position in several of the problems which frequently vex the medical profession. With Welsh reformist fervour he exhorted doctors to be less fearful of unlikely legal consequences and to act more with the benefit of the patient and society in mind.

The 'patient's consent' is covered largely by the consent form. The age of consent of a child may now be taken as sixteen, although the law is uncertain. It has been established that a child may be operated on, when necessary, without the patients' consent, with fewer formalities than hitherto. A similar situation exists in mental hospitals, where the patient's consent may not be obtainable.

Euthanasia, as such, is completely contrary to law, with or without the patient's wish. It was suggested that some modification of this might be humane. However, legally a doctor may administer any amount of narcotics necessary to procure the relief of pain, even if death ensues somewhat earlier on this account. Mr. Williams thought that there was too little realisation of this in the medical profession.

Sterilisation is lawful on therapeutic and eugenic grounds although practice varies widely. There is no ruling as to its legality as a method of contraception; probably there would be no objections, especially with the development of 'reversible' operations.

The law on abortion is confused. Abortion is at present permissible on therapeutic grounds: Mr. Williams suggested that humanitarian, eugenic, and socio-medical grounds should also be considered. In Sweden there

is a system of application to a medical board. This has undesirable consequences: abortion is frequently delayed longer than is safe, and since many are rejected, criminal abortion continues. It is interesting that in Eastern Europe, where there is no restriction on abortion, save that it must be performed within the first three months of pregnancy, the

mortality rate is only one quarter that of the normal natal mortality; in Sweden the risk is much greater.

Mr. Williams said that 'moral absolutists' were inconsistent in their treatment of the early foetus and that they should take more account of 'social evils'. His remarks provoked many questions.

WHITHER SHALL WE WANDER?

By Jasper

Apparently early morning after very late night. Phone seems to be ringing. Reach out sleepily to answer it. Raucous voice disturbs befuddled thoughts; head aches. 'Tis the Editor demanding copy. Attempt to control the random and sleepy activity of neurones into coherent thought: last night vague memories of good party, women, beer . . . but it's no good as angry editor using most dreadful language, putting all beautiful thoughts out of head

Reach out for old envelope, on back of which are notes made when wandering last night before party. Attempt at reading them makes head feel as if thousands of tiny men, with sharp boots on, are playing football inside skull. Football—that rings a bell—Wells Hotel. Well Walk, Hampstead; not hotel but pub, with football game in public bar. Frustrating and impossible game, keeps one in terrible state of nervous tension, knocking back drinks without noticing price, as little wooden men kick at balls in some way under your direction. Utterly exhausted crawl through into little saloon bar. Here relax in front of coal fire, in pannelled room . . . padded cell . . .

Ahhhh . . . It's that bloody editor man again, just as I'd got to sleep. Shouting abuse such as jolly good thing it's your last article, etc. Had most terrible nightmare because of him no doubt. Dreamt I had been queueing for half an hour on British Railways express to get drink; given tiny tin, about 8 or 10 fluid ozs., containing well known beer; fish out shilling, attendant looks as if he thinks me mad. Charge 2/1d., that means about 4/2d. a pint. Collapse. Awake to find myself in Freemasons Arms, Downshire Hill, also in

Hampstead. Large brightly lit exterior, makes headache worse; inside everyone bright and cheerful, talking in witty manner, throwing their arms around. Plead with friends to go home lead to pin-ball machine, insert coin, balls go clang clang, lights flash on and off; oh what a gay old life it all is I say, give me the good old shove halfpenny any day. Immediately dragged off to other side of bar, halfpennies produced, another frustrating game, trying to get the things into beds, sounds quite disgusting. Detach myself from drunken crowd to inspect the Flook cartoons on the walls; fail to understand them as you have to be very educated to understand Flook. Looking around the place it reminds me of somewhere: Jack Straw's Castle before the renovation. Wonderful idea hits me; creep out and up the hill to the Pond. Into Jack Straw's, up to the turret bar, order large scotch, sink into plush velvet chairs into oblivion . . .



Well's Hotel



The Christmas Card, 1964

Christmas Card Order Form.	Please use BLOCK CAPITALS
NAME:	No. of cards required
ADDRESS:	Cost at 4s. per doz£ s. d.
	Plus postage, 1st doz. 9d
	additional doz. 4½d. (Orders over 5 doz., post free)
	Total £ s. d.

Please enclose remittance with order, addressed to The Manager, The Journal, St. Bartholomew's Hospital, London, E.C.1. Cheques and P.O.'s payable to St. Bartholomew's Hospital Journal.

Signed

PENGUIN REVIEWS

The Child Buyer, by John Hersey Penguin. Price 4s, 6d.

The startling title of this book may act as a deterent and the sub-title is hardly encouraging to the wary reader: "A novel in the form of hearings before the Standing Committee on education, welfare and public morality of a certain state senate, investigating the conspiracy to purchase a male child". But the commercial exploitation of the child genius is a serious theme and John Hersey develops it in a novel and frightening way. The United Lymphomilloid Company purchases children of exceptional intellectual ability, and to ensure the "utilisation of their innate equipment at maximum efficiency", subjects the victims to a series of radical psychological and physical procedures. The deconditioning techniques combined with sensory deprivation, which were used in David Karp's "One" to standardise the nonconformist and the heretic, are here extended and supplemented by "major surgery" and psychotropic drugs.

are nere extended and suppremented by major surgery" and psychotropic drugs.

This satirical novel was first published four years ago. Its republication by Penguin coincided with a B.B.C. programme on the exceptional child. The "Radio Times" introduction included the following passage: "Geniuses, until recently, were thought to be born and not made; now evidently they can be made before they are born. In fact already 4,000 of these 'cultivated' geniuses have been created by the treatment of South African mothers during pregnancy. None of these children is more than five years old yet, but some are already behaving like children twice their age. There is now in a London Hospital a 'decompression apparatus' which can produce these prodigies'.

Maurice Lipsedge.

Mr. Love and Mr. Justice, by Colin MacInnes. Penguin. Price 3s. 6d.

Against the dark backcloth of the London underworld Colin MacInnes unfolds for us an endearing little story of vice and virtue. Set in the dockland of London, a region full of people phantasmagoric to most of us, he recounts how one Frankie Love, a young out of work seaman, involves himself in a fascinating relationship with a sympathetic prostitute. Tempted towards easy living he philosophically accepts the opportunity to become her ponce, together with the problems that accompany such a role. His progress is finally hampered by his encounter with Ted Justice a young policeman, recently promoted (but still only on probation) to the local vice squad, who has complicated his already lazardous and somewhat involved career by pursuing, in direct conflict with his ambitious nature, an ill favoured relationship with the daughter of a police hater.

I found this an easy book to read despite the continual change of scene, and enjoyed the author's understanding of this section of the community, for he is obviously at home with his characters and a master at describing their environments, lending atmosphere to each event he relates. One feels that this affords what one may assume to be a fairly true, if somewhat depressing insight into life in this quarter. Despite this I was disappointed to find that my net impression was of having read a novel which somehow escaped from reality, leaving a residue of rather sterile characters.

I.M.A.W.

What's wrong with Hospitals? Gerda L. Cohen. Penguin Special. 3s. 6d.

"A year ago I had an operation at a hospital of considerable repute, which gave me the very best of medical attention, and also taught me that patients do not count". This is the opening sentence in the foreword to Mrs. Cohen's book and it comes as somewhat of a shock to those who come into daily contact with patients in hospital. But do not let yourself be deceived into thinking that these are the words of a biased writer. The chapters that follow are a clear and objective assessment of the state of hospitals in Great Britain at the present time. It is interesting to read this short book in conjunction with a recent report on the patients' views of admission to a teaching hospital (British Medical Journal, Sept. 12th 1964). Mrs. Cohen's main thesis, that patients are kept in ignorance not just about their own condition but about everything that goes on in hospital simply because its no one's job to tell the patient what is happening, is strikingly confirmed by the report. Three quarters of patients preferred staff to wear name labels so as to assist in identification, and over a third of all the patients were dissatisfied with the explanations given them about their illness. All the old issues that cause so much dissension, visiting hours, children in hospital, food, size and layout of wards are examined impartially. Not everyone will agree with some of the writers comments on the nursing profession, or such sweeping statements as, "Traditionally hospitals regard patients' time as valueless and consultants time as invaluable". Ignorance of the medical aspects of the issues under consideration account for certain weaknesses in her arguments. She is at her best in dealing with the mental hospital situation and the book is well worth reading for the section on this subject alone. The picture is not all gloomy, nevertheless, at the end of the last chapter one is left feeling that there is, unfortunately a large element of truth in the initial premise that in hospital patients don't really count. GRH

OTHER REVIEWS

How To Use A Medical Library: a guide for practioners, research workers, and students, by Leslie T. Morton. Fourth edition. London, William Heinemann Medical Books, Pp.vii, 66,

Thirty years ago this unpretentious book first appeared as a guide for non-librarians on the way to use medical libraries. The fourth edition is welcomed as an up-to-date version of a significant aid. the value of which is inversely proportionate to its size. Students and research workers can save themselves much time, and also derive great pleasure and benefit by learning to help themselves in tracing references, using catalogues, and tracking down required items on the shelves. Trained library staff is not always available to help every enquirer, but most libraries are adequately guided to assist the reader who can follow this little book for initial instruction. It provides information on catalogues and schemes of classification; on bibliographies and their use; on the location of literature; on the compilation of bibliographies; on periodicals; and on abstracting services, arranged by subject. Information on the principle medical libraries in Britain is also given, and books from many of these can be borrowed through other libraries.

This is a book that every student and medical man using a library should possess. It reveals the wealth of medical literature being published, indicates the abstracting and indexing organs serving as keys to the contents of the innumerable periodicals, and reveals how librarians attempt to organize their collections to serve readers. There is no mystery about it, and this book will quickly initiate a reader into the full enjoyment of browsing usefully among books, finding his immediate requirements, discovering hitherto unknown sources, and appreciating the full significance of the printed word as sources of knowledge, pleasure and consolation.

John L. Thornton

W.L.R.

Lecture Notes on Psychological Medicine, by Ferguson Rodger, I. M. Ingram, G. C. Timbarry and R. M. Mowbray. Second edition. Edinburgh and London, Livingstone. 1964.

This little volume compresses the lecture notes for undergraduate students in psychiatry at Glasgow. Here psychiatry is presented in a nutshell. Despite this, it is clear, informative and useful. The main disorders are succintly presented and other chapters deal with psychotherapy, physical treatments, legal aspects, psychiatric emergencies, etc.

This book will serve as an excellent basis for further reading. A glossary of terms is given at the beginning of the book and is intended as an explanation of how the terms are used in the book, rather than as strict definitions. Nevertheless, certain of the definitions need improvement, such as confabulation, delusion, dementia and obsession. This is a very minor fault in a book which many students will find an invaluable standby for clinical work and examinations.

The Nursing of Accidents, by Raymond Farrow. English Universities Press, Price 8s. 6d,

The surgeon specializes in the treatment of fractures, or thoracic conditions, or diseases of the ear, nose and throat; the casualty surgeon too is a specialist, although his province is the whole body and not a particular system. He is prepared to undertake life-saving measures following injury to any or many structures.

Mr. Farrow's book illustrates well the breadth of the casualty surgeon's work. It is well-illustrated, easy to read, full of information, and most reasonable in price. The only real criticism that could be made is of the title. There is really very little about nursing in it; for instance, closed pleural drainage (page 49) is finished in six lines. It is a simple, clear book on the treatment of accidents, written in language that the nurse can understand, and from which she will benefit. Had her own role in the casualty department been made clear, she would appreciate it still more.

Doubtless Mr. Farrow's book will need another edition quite shortly, when he will be able to add instructions about external cardiac massage (page 53) which is not frequently required in his depart-

W.E.H.

The Basic Principles of Accident Surgery, by M. C. T. Morrison. H. K. Lewis. London. 1964. 109 pages, 29 illust. Price £1 1s.

As its title suggests, this book sets out the principles of accident surgery and does not pretend to deal with details of treatment. Because of this, certain aspects of the subject are sometimes over simplified. The book is adequately illustrated, concise, and being written in a very readable manner, it can easily be read in an evening. There is a useful summary at the end of each chapter.

In the first chapter, and to some extent throughout

the book, the author rightly emphasises the importance of treating the patient and not merely the disease, and points out that the final object of treatment is restoration of normal function. It is perhaps surprising therefore that he does not include a chapter on rehabilitation of the injured patient

and the use and abuse of physiotherapy.

The book is written in two sections. The first discusses the treatment of injury to individual tissues such as bone, nerves and blood vessels, together in each instance with a short paragraph on the physiology and pathology involved. The second section deals with clinical injuries commencing with the problem of the patient with multiple injuries. The chapter on ventilation and chest injuries is particularly well written.

The book is by no means a manual of accident surgery, and details of treatment are left to the standard textbooks of surgery. It is nevertheless a most valuable guide to the principles underlying the management and treatment of the severely injured patient and as such could profitably be read by all medical students who are liable one day to be the receiving doctor in a casualty department. The lack of detail however, makes it a book to read rather than a book to buy.

R.L.R-I.

Savill's System of Clinical Medicine, edited by E. C.

Warner. 14th edition. E. Arnold. £5 10s. 'Savill's System of Clinical Medicine' is a text book of clinical medicine arranged primarily on the basis of the patient's symptomatology. This is in effect the reverse of the arrangement which is usually followed in text books of clinical medicine; instead of assuming a diagnosis and describing the disease and its treatment, the author attempts to take his reader step by step through the process of arriving at the correct diagnosis from among a group of possible ones, before describing the clinical entities with their complications, treatment and prognosis. Although this arrangement has the superficial attraction of imitating the way in which clinical problems are worked out in practice it does not favour a concise presentation of the subject matter, and sometimes results in topics being grouped together or separated on rather tenuous grounds. It is the reviewer's opinion that the presentation which Dr. Savill adopted in his text book about fifty years ago is more effective at the bed-side and in the clinic where dogmatic statements can be qualified and exceptions emphasised more succinctly.

The book includes sections on dermatology, psychiatry and gynæcology and its main use to the undergraduate student will probably be for occasional reference rather than for systematic

reading.

R.W.E-W.

Forensic Medicine, by Keith Simpson. London: Edward Arnold. Pp. 356. 1964. Price 37s. 6d. Since Professor Simpson's book is virtually the only forensic text-book suitable for undergraduates,

it seems a pity that its price has now risen to 37s. 6d. To say this is not to underestimate its worth for qualified practitioners and its high stan-

dard is maintained.

Its initial impression of a reprint rather than a new edition is not supported by closer scrutiny. Although the index has been enlarged there are the same number of pages and illustrated plates, a number of the latter showing replacement and repositioning. It is also true that one needs to "comb" very carefully to find new material in the first section, such as blood agglutination, cell sexing and diatomes, but here again the facts have been welded or dovetailed skilfully and unobtrusively into the previous format without alteration of the layout of the text.

The toxicology section contains some interesting illustrative diagrams of modern trends in the incidence of poisoning and includes a galaxy of the latest synthetic drugs under their appropriate headings. Even so, the common poisons remain the cinderella of the book. The barbiturates, especially, need greater space and more than two pages description (there are still four pages on arsenic poisoning), and the chapter on abortifacient drugs would have added impact and greater relevance placed next to the main chapter on abortion.

For all that this book is still a pleasure to read; its crisp, concise style laced with a dry wit has made it "par excellence" the doyen of text books for the

There may have been more discursive works but none of such good value. It should remain so. Dynamic Pathology, by Maurice M. Black and Bernard M. Wagner, Published by C. V. Mosby Co. (Distributed by Henry Kimpton, London). Price 60s.

This new book by two New York professors of pathology aims to present pathology as an extension of anatomy and physiology. To achieve this praiseworthy ambition the authors have written a lengthy essay which is divided into two parts. Part 1 is entitled "Homeostatic Mechanisms" and consists of nine chapters, whilst Part 2 on "Challenges to Homeostasis" includes neoplasia, ionizing radiation, deficiency diseases, infectious diseases and ageing. In fact many disturbances of homeostasis are inevitably presented in Part 1 and the "thread of continuity", which the authors seek to emphasise, is at times obscured in a mass of detail without obvious relevance to the main theme.

It is not quite clear for whom this book is written. In the preface it is stated that the book is not intended to be a substitute for a formal course in pathology and for this reason there are relatively few illustrations. Several of the photomicrographs, like parts of the text, reflect the particular interest of one or other author. At one moment the authors seem to be addressing themselves to the beginner and at the next they are launching into deep waters where the beginner must surely be out of his depth. This is perhaps the most serious criticism that can be made of an otherwise novel and refreshing approach to the subject. Another drawback is that there are no references in the text to support the statements made, some of which may be considered open to question. The list of references at the end of each chapter is diverse and often includes the titles of motion pictures—an unusual departure of doubtful

A.G.S.

A Laboratory Guide to Clinical Diagnosis, by R. D. Eastham and B. R. Pollard. John Wright and Sons Ltd. 18s. 6d.

This pocket-book consists of lists of tests under the headings of the various dieases, following the

usual order of a text book of medicine.

Tests are divided into diagnostic tests, tests supporting the clinical diagnosis, and non-specific tests. The section on infectious diseases is moderately concise, but when the authors come to diseases of metabolism, liver, etc., the lists get out of hand. All possible non-specific tests are given; e.g. under idiopathic steatorrhea there are seventeen and under hepatitis thirty-two.

According to the preface, "It is hoped that this book will be of use not only in hospitals, but also to general practitioners who have access to laboratory facilities," but there is little advice to the practitioner on which tests to choose; e.g., which of the twelve tests listed as supporting the clinical diagnosis of myocardial infarction.

In their introduction the authors say they have attempted to give an appreciation of the value of laboratory tests both in diagnosis and in the assessment of progress. It is doubtful if this object can be achieved in such a condensed form. One can only say that their attempt has not been completely successful.

A.B.A.

Bibliotheca Bibliographici. A catalogue of the library formed by Geoffrey Keynes. London, Trianon Press. 1964. (Distributed by Bernard

Quaritch Ltd., 15 gns.).

Few substantial catalogues of private libraries are printed these days; in fact it is often suggested that the days of the great book collectors are over. The tremendous increase in the cost of books since the war, and the continuing rise in prices have resulted in fewer collectors: the cost of printing has deterred even the most ardent from attempting to issue a catalogue of his holding. Many of the largest personal collections have gone to university and other libraries, the American libraries being the chief repositories in recent years, and they are also the main customers of our rare book dealers, whose prices reflect the continued demand for steadily decreasing stocks.

Many great collectors of the past have been associated in one way or another with this Hospital. Francis Bernard (1627-1698), Edward Browne (1642-1708), Charles Bernard (1650-1711), Richard Mead (1673-1754), Anthony Askew (1722-1772), and Sir D'Arcy Power (1855-1941) immediately come to mind, but the sole monuments to the book-collecting activities of most of these are sale catalogues. Sir Geoffrey Keynes has not only built up a remarkable "working" collection of books, many of which have featured in the scholarly bibliographies compiled by him, but has produced a monumental catalogue of some 4,300 items, yet constituting only a pro-portion of his library. Beautifully produced and illustrated by items associated with Audubon, John Baskerville, Thomas Bewick, William Blake, Peter Bruegel the Elder, Rupert Brooke, Charles Darwin, John Donne, Thomas Fuller, John Lock, John Ruskin, Edward Tyson, Andreas Vesalius, among others, it represents the highest attainment of the

printers' and binders' arts. This tome contains "Religio Bibliographici", Sir Geoffrey's Presidential Address to the Bibliographical Society, and includes manuscripts, letters, prints and pictures in addition to printed books. Described as a "short-title catalogue", it avoids complete bibliographical descriptions but contains interesting annotations, and has an index of owners and donors, and of binders. It is invidious to select items for comment, but the following are well represented, some by magnificent collections that have gradually accumulated by judicious selection over the years: Jane Austen; Sir Francis Bacon; George Berkeley; John Betjeman; Thomas Bewick; William Blake; Robert Boyle; Timothie Bright; Rupert Brooke; Sir Thomas Browne; Charles Darwin; John Donne; John Evelyn; Thomas Fuller; Edward Gibbon; Eric Gill; Stephen Gooden; William Harvey; William Hazlitt, Robert Hooke; A. E. Housman; Samuel Johnson; Lord Keynes; T. E. Lawrence; Martin Lister; John Locke; Richard Lower; William Pickering; John Ray; Siegfried Sassoon; Edward Tyson; and Thomas Willis, a motley collection of authors, artists, scientists, etc. Any collector would be proud of owning just one of these as represented in Bibliotheca Bibliographici.

Private book-collecting is not dead, and there are still bargains to be obtained. Prices are unlikely to fall, so that carefully selected items are a good investment. But newcomers will have to be content with narrower fields than Sir Geoffrey, and might usefully start their collections by investing in a copy of this catalogue. It will be dipped into with profit and admiration; it will be proudly displayed to fellow booklovers; it will become rare because only 500 copies have been printed, and the American libraries are avid collectors!

(Sir Geoffrey has kindly presented a copy of Bibliotheca Bibliographici to the Medical College Library, where it will be shelved in the Athenae Collection of writings by Bart's Men).

An Introduction to Neurosurgery, by W. Bryan Jennett. Pp. 326 + xiv illustrated. London: William Heinemann. 45s.

In his preface the author points out that neuro-surgery is still often regarded as mysterious and difficult and of limited value to most patients. The book is written to dispel the mystery and to lead to a better understanding of neurosurgical principles. In the opinion of the reviewer it should do much to achieve these aims and can be read with profit and enjoyment not only by neurologists and neuro-surgeons but by all who may become involved in

neurological problems.

A series of excellent chapters, almost half of the book, deals with intracranial neoplasms. Their clinical diagnostic features, including those of pressure cones, are described, and the accessory methods of diagnosis and their appropriate application considered in detail. The pathology of these neoplasms is discussed and their treatment described without unnecessary surgical detail. Head injuries are fully considered. Their pathology is well described and their clinical features discussed. Diagnosis and treatment is outlined with clarity. Other excellent chapters deal with intracranial infection, aneurysms, and compression of the spinal cord and nerve roots. In the section dealing with spina bifida and hydrocephalus the author takes the side of those who consider that early excision of a meningo-myelocoele followed by an appropriate operation for the frequently associated internal hydrocephalus is the right course. In the final chapter a co-author discusses the treatment of intractable pain and stereotaxic surgery. The illustrations, both line drawings, and reproductions of photographs, are excellent.

The clarity of style makes this little book a pleasure to read. It contains much valuable information and can be confidently recommended to all with neurological or neurosurgical interests. It should certainly stimulate such interest in all who

J.E.A.O'C.

WHAT



IT STANDS FOR security and peace of mind from the day you qualify-until the day you retire-and after. IT STANDS FOR the provision of advice on all your professional problems . . . for legal assistance in any difficulty or proceedings of a professional nature . . . for unlimited indemnity in respect of damages and costs in the event of an adverse verdict or a settlement out of

IT STANDS FOR THE MEDICAL DEFENCE UNION the oldest and largest organisation of its kind in the world. Further particulars can be obtained from

THE MEDICAL DEFENCE UNION Tavistock House South, Tavistock Square, London, W.C.1

Secretary Dr. Philip H. Addison

Dental Secretary A. H. R. Rowe. B.D.S.. F.D.S.

SPORTS EDITORIAL

With the end of the year fast approaching, it is interesting to look back and see what has been achieved in the sporting world in the

last twelve months.

The recent Olympic games must of course be the big factor still freshly ingrained upon so many people's minds. Here Britain showed that she is really capable of holding her own against the big nations who are much more heavily subsidised, and give their athletes much better opportunities for training, and much more money for equipment and facilities. However, it was the athletes who came from the background into the limelight, and those of whom we were expecting so much in other spheres were the less favoured with medals. It is surely not conceivable that these latter could have slackened off and given of anything but their best: perhaps there is a swing of the pendulum to that part of sport in which we have been a trailing nation: or perhaps, on the other hand, the emphasis by the schools in more recent years on a more intensive and careful use of the time for games and athletics is paying off.

There seems little doubt though that we have

got to the stage where little advance is only gained by immense extra effort, and it is therefore gratifying to see that Britain as a sporting nation is meeting up to the big new challenge

In our own surroundings at Bart's it has been a successful year for sport. The Rugby Club finished its best season since the war with a credit of 18 games won, 2 drawn and 15 lost. This gave a total of 358 points for, and 292 against. The only disappointing aspect was the poor cup run; but already they are off again to a very good start, let's hope it brings all the fruits of recognition this time.

Most other clubs had a good season with some very good cup runs this year. The soccer club reached the semi-final to be denied a place in the final by a somewhat unfair change of venue to favour Guy's and London. The Cross Country club won their cup-congratulations to them. The tennis club reached the final and lost to Mary's and the golf club reached the semi-final. With, it seems, so much cup final potential around we can look forward to another exciting sporting year.

SPORTS NEWS

SPORTS FIXTURES FOR DECEMBER

5th.

Rugby v. Old Cranleighans. Away. Soccer v. Royal Veterinary College (U.L.). Away.

Hockey v. Tonbridge. Home.

Boat Club, University of London Winter Eights, Chiswick,

9th.

Soccer v. Westminster Hospital (U.H.L.). Away.

Boat Club, "Bart's Tommies" Scratch Regatta.

12th

Rugby v. Old Askeans. Away. Hockey v. Tulse Hill. Away.

CROSS COUNTRY

Friday, October 23rd. London Colleges Cross Country League. First Match.

We entered a team of six for this match. Considering that three of our runners probably have not run 6\frac{3}{4} miles before, let alone at the high velocity which was possible over the hard ground at Parliament Hill Fields, they did very well indeed. They will be more successful still over a normal 5 mile course

1. Yates (U.C.), 34m. 25s.; 2. O'Reilly (St. Mary's), 34m. 30s.; 3. Barton (King's), 35m. 1s; 17. Thompson (Bart's), 37m. 9s.; 58. Sanders (Bart's), 40m. 30s.; 73. Markham (Bart's), 41m. 8s.; 89. Hesselden (Bart's), 41m. 47s.; 125. Coltart (Bart's), 43m. 44s.; 149. Kitchener (Bart's), 46m. 33s.

We are 9th out of thirteen in the first division of the League, but this will improve when Terry Foxton returns to our fold.

Friday, October 30th. U.L. v. Cambridge University at Cambridge.

Although Cambridge University made a clean sweep of all four matches, the three Bart's runners did very much better than in the League Match of the previous week. Robert Thompson was first U.L. man home (in 7th position) in the second team match. Roger Sanders was 11th and Richard Markham 26th in the 3rd/4th team match, both leaving behind U.L. runners

who had beaten them at Parliament Hill Fields. Times: 1. Edwards (C.U.), 30m. 38s.; 2. Yates (U.L.), 31m. 6s.; 3. Barton (U.L.) 31m.

Yates (U.L.), 31m. 6s.; 3. Barton (U.L.) 31m. 24s.; Thompson, 33m. 40s.; Sanders, 35m. 5s. and Markham. 36m. 43s.

R.T.

SOCCER CLUB

Saturday, October 10th. St. Bart's 1st. XI v. Royal Veterinary College. University League. Win 11-0.

For this match we welcomed two newcomers, David Ormerod and Peter Raine. Despite the impression suggested by the score both teams had a fair share of the play! The match was won, if anything, by the fitter team—which is both surprising and pleasing.

Early on it was obvious that the Vets' goal-keeper was having a sad day. After good goals by Thew and Sutton, Bart's played more confidently and the score reached 7-0 at half time.

In the second half Herbert almost smashed the crossbar with a shot which thundered into the roof of the net and then scored two more well taken goals. The defence played well throughout, Raine and Layton-Smith playing confidently, so that the Vets never came really close to scoring.

Team: Layton-Smith, Rawlinson, McGechie, Offen, Raine, Turner, Ormerod, Thew (5), Herbert (3), Sutton (2) and Dorritt (1).

Wednesday, October 14th. St. Bart's 1st. XI v. Royal Dental Hospital. U.H. League. Draw 1-1.

This was a fast game on a greasy pitch. The Royal Dental's forwards having the advantage against a rather shaky Bart's defence. Layton-Smith in goal, however, played well and conceded no goals in the first half.

Bart's forwards were moving well together, and soon after the start Herbert scored from a free kick outside Dental's penalty area. By this time Bart's were playing more confidently and had the better of the game.

Play became less like football after the Dental's equalised towards the end of the match. Both sides became panicky in defence and attack but Bart's were unlucky not to score several times through Sutton.

Team: Layton-Smith. Rawlinson. McGechie. Offen. Raine. Turner, Ormerod, Thew, Sutton, Herbert (1) and Dorritt.

Saturday, October 17th. St. Bart's 1st. XI v. Westminster Hospital University League. Win 3-1.

In this match there were signs of the many pathetic performances last season. We also welcomed back into the side last season's Captain, Phillips, playing in an unhappy pair of plimsoles.

Bart's defence had a lot of trouble dealing with a clever Westminster centre forward and, although Bart's had the run of the ball, Westminster took the lead with a breakaway goal. This matter was soon righted by a Sutton goal from a Thew cross.

Bart's took the lead in the second half with a goal from a perfectly timed header by Sutton this time from a well placed centre by Phillips. Dorritt put the result beyond doubt, sidestepping a defender, to score the third goal. The game then more or less disintegrated into short, shaky passes between Bart's defence and the Westminster forwards, and vice versa.

Team: Layton-Smith, Rawlinson, McGechie, Offen, Raine, Turner, Ormerod, Thew, Sutton (2), Dorritt (1) and Phillips.

Wednesday, October 21st. St. Bart's 1st. XI v. University College Hospital. U.H. League. Draw 1-1.

The two teams were well matched in this game but Bart's had the edge on their opponents throughout. Herbert put Bart's ahead midway through the first half.

It was some time before Bart's mastered the U.C.H. attack. Offen and Rawlinson worked well together in defence, and Porcherot was never in real trouble. The forwards were unlucky not to add to the score in both halves.

U.C.H. eventually equalised in the second half. Porcherot played a near faultless game as a last minute replacement in goal, but Bart's need a permanent goalkeeper if this season is to be a successful one.

Team: Porcherot, Rawlinson, McGechie, Offen, Raine, Turner, Dorritt, Thew, Sutton, Herbert (1) and Phillips.

D. McG.

SQUASH CLUB REPORT

There is a sad lack of squash talent at Bart's at the moment. There are only eight people in the whole hospital who are good enough to play in most of our first team

fixtures, and three of the best five of these are qualified, and therefore not regularly available. There is, however, a large number of people who play regularly and are keen to improve their game, and the squash ladder has therefore been revived in an attempt to stimulate a more competitive atmosphere.

The A.G.M. was held on the 19th October. John Mitchell was elected Captain, Mike Downham Hon. Secretary, and Tony Edelsten and Chris Edwards were appointed members of the Committee. The problem of the 6d. locks was raised. It is clearly ridiculous to continue with a system which is so open to abuse, and which leads to a certain amount of damage to the courts by encouraging people to attempt the all too easy climb down from the gallery; but the Club cannot survive without the income from the boxes. Any suggestions would be welcomed.

Despite our shortage of good players, we have done well in the matches so far. John Mitchell is a strong No. 1 in any company, and Brian Duff, who has recently returned to the Anatomy Department, will be a very welcome No. 2 when he is back in form. But after that there is rather a gap in standard, so that Edelsten, Downham, White, Kettlewell and Edwards always have a struggle to win. Our win against Roehampton, who are a strong side, was particularly satisfactory. In the Cumberland Cup we have beaten the Metropolitan Police, but despite a very good win by Edelsten we just failed to beat H.A.C. in a match that was not notable for its friendliness. Incidentally, the final results of last year's Cumberland Cup show that we have moved up two positions in our division, and might have gained promotion but for some post-Christmas lethargy. These improved results are largely thanks to Tony Edelsten's industry last year.

oculte.

Results:	
1st Team v. Old Paulines	Won 3–2
v. Roehampton	Won 3-2
v. Metropolitan Police	Won 3-2
v. H.A.C.	Lost 3–2
TeamMitchell, Duff, Edelsten,	Downham,
White Kettlewell, Edwards	S

2nd Team v. Westminster Hospital Won 3-2 v. Guy's Hospital Lost 0-5

Team.—Kettlewell, Edwards, Chesney, A. Gordon, Graham, G. Gordon, Fair-clough.

M.A.P.S.D.

RUGGER CLUB REPORT

Saturday, October 10th v. Old Blues. Won 18-8.

This was a particularly frustrating game, in which Bart's were obviously superior in all departments, but were unable to find that extra fire needed to score points. After a scrappy first half, playing uphill, Bart's led shakily by 8-0, thanks to a try by Harris, and a Gibson penalty.

The second half continued in the same fashion, with Bart's especially missing Smart's presence in the loose play. Forwards and backs were slow onto the Old Blues' mistakes, whereas the Blues capitalised on ours, to level the scores. The support of the Extra A, who had finished their game, then shook the side out of its lethargy, and some sparkling handling and running by the whole team led to two more converted tries by Savage and Gibson.

Wednesday, October 14th v. C. U. LX Club. Lost 3-22.

This was a tragic day in many respects. Goodall and Smart were injured, Harris and Letchworth were unavailable, and Griffiths and Johnson were injured during the course of the game. Three other players were late arriving, so two were brought up from the A, and the team played one short until the Secretary arrived! Nevertheless this was no excuse for a thoroughly pathetic display, in which nobody worked up any sort of fire, and everyone refused to tackle. Apart from a Gibson penalty, Bart's were on the receiving end all the time, and the very fit and fast LX Club side ran through at will. Altogether a day to forget.

Saturday, October 17th v. Woodford. Won 9-8.

Bart's went to Woodford determined to erase the memory of the Wednesday before. We won, but there are still problems to solve. Smart made a welcome return to the second row, with Pope at wing-forward and Grafton at scrumhalf, but Goodall, Griffiths and Orr were unable to play.

The XV started well and shook Woodford, and scored by continued pressure through Smart. However the Woodford pack was lively, and often the ball was heeled from a pack standing still or moving backwards. Consequently the backs were at a disadvantage in trying to run, but lacked imagination in being unable to avoid the covering of a wing-forward who persistently stood out from scrum and line out with the threes.

Defensive lapses let in Woodford to make the score 6-8, Gibson having scored a penalty. With time running out, Bart's made a last desperate effort, and Letchworth scored a fine try after a run by Gately, who played a good steady game at fly-half. Bart's survived a last minute attack and emerged just worthy winners.

Saturday, October 24th v. Esher. Lost 6-34.

The less that is said, the better. This was probably the worst display by a Bart's side for years. The whole side seems over-confident, and no-one is taking the pre-match hours seriously enough, or thinking about the game.

An early defensive blunder let the Esher centre in for a try, but the defence then improved for a while. However we were consistently losing all scrums and lineouts, and sheer force of numbers, and frequently of attacks, led to many tries. All cohesion. spirit and tackling went to pieces and 34 points were scored against us; Bart's only replied with two Gibson penalties. The pack improved at the end, and with a little possession the backs showed that they could have been dangerous given more of the ball.

Saturday, October 31st v. Harlequin Wanderers. Drew 11-11.

Goodall and Griffiths made a welcome return to the side, with Johnson and Fryer coming in at wing and full-back, and Grieve making his debut at hooker. The game was played at a fast pace, and after a slow start the pack, outplayed in the tight, completely dominated the loose, and fine interpassing in which Delany and O'Kane were prominent led to Harris following a kick ahead and scoring. Then followed a most remarkable try. We were awarded a penalty just to the left of the posts about fifteen yards out. Gibson strolled up as if to take a penalty, kicked it to himself and calmly dived over amongst the mesmerised Quins. He then missed the conversion!

Ouins went into an 11-8 lead through poor tackling, but Bart's dominated most of the late exchanges, Gibson levelling the score with a penalty. This was a much improved display, with now virtually a full side again, against a very strong Quins side. An encouraging preview for the tour.

P. E. S.

THE MEDICAL PROTECTION SOCIETY

ADVICE · DEFENCE & FULL INDEMNITY FOR DOCTORS & DENTISTS AT HOME & OVERSEAS Founded 1892

50 HALLAM STREET · LONDON · W.1

Secretary: Dr.H. A. Constable.

Tel: LANGHAM 9241

BOAT CLUB REPORT

Rowing picked up after an August rest in the second week of September in the shape of a coxless IV that trained for the Head of River IV's. Bow, M. Keighley; 2, B. Ayers; 3. R. Nicholson; Stroke, A. Crowther. Rowing in the quiet evenings of the Indian summer at Teddington thrilled us all and it was with regret that we returned to the tideway for the race. As we lined up at No. 29, the last but one of the coxless IV's, we wondered who would be trailing behind us. It was the Thames IV that competed for a Tokyo place—what company! After some of the expected chaos at the start we were off into a headwind against the tide. We battled well with the rough water to Hammersmith, but at the mile post we became short in the water. At this point we were passed by the experienced Thames IV. But we were not disheartened and passed 3 crews to finish level with London Hospital who started some 50 seconds before us. The final result was that we finished 14th (halving our starting position) in the coxless IV division. The London Hospital IV came 49th in 13m. 54s. A satisfactory result.

Crews are now training for the U.H.R.C. Winter Regatta. Even at this stage of the year it is apparent that two basics need special attention. The first is watermanship or rowing skill. It amazes me the number of oarsmen who lack feeling to improve their skill. Experience can be gained by time but skill can only be improved by endeavour and purpose of action. The lack of watermanship is due to the neglect of small boat rowing both here and at school—the fact that this Club does not own either a pair or a sculling boat does not help, but one cannot be too critical of this at £250 a boat! But this neglect must be rectified. The second essential is the realisation that no win, however large, is gained without a great deal of hard work and determination. It is no use putting the blade in the water if there is no work applied —we should all have heard of Newton. Work

must be done to make a boat move!

Attention to these two basic essentials will improve the success of the Club. We should not be satisfied until we can compete favourably with national crews—being uppermost in the Hospitals is not enough.

A.B.A.

HOCKEY CLUB

Saturday, October 10th v. Beckenham 2nd XI. Lost 5-2.

Bart's were against a skilful team for their first game and were surprised to be 2-1 up at half time. Peek and Goss scored the goals from the left hand side of the attack

Lack of fitness showed in the second half and Beckenham rattled in several goals in a short time. Otherwise the defence played well, strengthened by two newcomers.

Saturday, October 17th. v. St. George's Won 8-0.

Bart's started well and quickly gained territorial advantage with forwards and backs moving well together. Goss and Peek linked well on the left wing whilst Wickes scored four times in the centre.

George's only managed one or two breaks in the second half in which Harrison came right up from back to score himself.

Again it showed good potential to build a useful team.

Wednesday, October 21st v. Kingston Grammar School. Lost 2-1.

They are always strong opponents, but Bart's had a new and improved forward line with Kingsley and Peek using the short square pass, absent in previous games. Goal scoring punch still seemed lacking but a long corner gave a 1-0 lead at half time.

Bart's failed to consolidate the lead in the second half and were saved from a higher score by Jordan saving a penalty.

Saturday, October 31st. v. Oxted. Won 4-0.
Again the improved forward line and strong defence looked promising against this average club side. The square and through pass were used effectively for Kingsley to gain a two goal lead at half time.

The two goals in the second half came from long and short corners by Thompson and Barclay, the former playing a solid game at centre half. It is hoped to continue this winning streak.

A.B.

CAMBRIDGE HOCKEY TOUR

Wednesday to Saturday, October 21st to 24th. Won 2. Drawn 2. Lost 0.

Our first game was against King's College which places all its emphasis on the academic side with optional light afternoon exercise for those who want it. However, recently their hockey has improved, and they put up some opposition. Bart's had territorial supremacy throughout the game, and it was a poor reflec-

tion on our forwards that we only won 2-0. The weather however was very depressing with a light drizzle throughout the game.

Our next game was very different for we played Jesus College, the cup winners of last year on a pitch which resembled a beatendown hay field. The weather was brighter and both sides played very fast and lively hockey. Our two backs, Thompson and Barclay, both played a very solid game, and celipsed a potentially dangerous inside left. It was 0-0 at half time with tension mounting, for the game could have easily gone either way. Jesus College managed to scramble one in half way through the second half; but Bart's fought back and Castleden scored near time. He nearly scored again but 1-1 was a fair result to a very exciting game.

Our third game against Selwyn College was played at a more leisurely pace. As in our first game, we held the advantage throughout most of the play, but failed to match it with a creditable score. Our goals came from a a short corner taken by Barclay, and from Peek. They scored once to give us a win of 2-1.

Our last game took us by surprise, as Pembroke had not won so far this season. It was a fast game on an excellent pitch. Our defence was as solid as ever, with Thompson playing an excellent game at centre half, ably supported by Barclay and Harrison at back. Our forwards were unable to put this support to good effect. However we did manage to score from a short corner, but still found ourselves 2-1 down with the second half fast drawing to a close. Another successful short corner saved the situation and the game ended in a draw, 2-2.

We returned from a very successful tour as an unbeaten side.

A.B.

THE RIFLE CLUB

The preliminary repairs to the stop butts having been completed, the Winter Season began in the Hospital Range in the middle of October. The start of the season was marked by a considerable influx of freshers to the Club of whom some thirty have continued to shoot regularly. It is hoped to maintain six teams throughout the year for events in the University and United Hospital Leagues and Knock-Out Competitions. The re-formation of the Pistol team has excited much interest and consequently the standard of the team has risen considerably. The first 'possible' of the season was scored by P. F. Tatham.

A.B.

ST. BARTHOLOMEW'S HOSPITAL JOURNAL

CLINICAL AND RESEARCH SUPPLEMENT

CONTENTS

Comparative Biochemistry as a Tool in Enzyme Research by Professor E. M.	
Crook	i
The Excretion of Intravenously Admini-	
stered Radio-Active Vitamin B12 by F.	
Lees and M. J. L. Patterson	iv
Current Investigations and Research Pro-	vi
jects in the Hospital Recent Papers by Bart's Men	vii
Recent rapers by Dares with	1 11

Supplement No. 5

Vol. LXVIII, JAN, 1964

COMPARATIVE BIOCHEMISTRY AS A TOOL IN ENZYME RESEARCH

by Professor E. M. Crook

This article is the substance of a lecture given by Professor Crook to the Harvey Society on 2nd December, 1963.

The so-called active sites of enzymes have long been of prime interest to biochemists, but it is only recently that methods have been evolved that allow a fairly direct investigation of the chemical nature of this region of an enzyme and some detailed understanding of the chemical reactions going on there. During the last few years, work has been carried out at University College by Dr. Watts and Dr. Rabin with the collaboration of Mr. Virden and myself on the creatine phosphokinases and related enzymes which catalyse the general reaction:

where "R" may be various radicles such that the resultant molecule is creatine, arginine, glycocvamine, etc. The creatine enzyme is, of course, the important "Lohman" enzyme of muscle, and we began work with the crystalline enzyme from rabbir muscle. It had been known for some years that creatine phosphokinase was inactivated by reagents that combined with thiol groups such as mercury and copper compounds, iodoacetate and N-ethyl maleimide. Iodoacetamide and iodoacetate were chosen as convenient reagents as we had succeeded in developing a method for estimating very small quantities of iodide by using a silver-silver iodide electrode. We were therefore in a position to follow the liberation of iodide when iodoacetate or iodoacetamide reacts with a thiol according to the following reaction

 $R-S^-+ICH_2 \cdot COO^- \longrightarrow R-S-CH_2 \cdot COO^-+I^-$

and at the same time use only small quantitites of valuable protein since the electrode is sensitive down to 10-6M iodide. It was found that whereas simple thiols such as cysteine rapidly reacted with the silver iodide of the electrode, the thiol groups of creatine phosphokinase do not, although

some of them react rapidly with the iodoacetate. It is thus possible to follow the time course of the reaction very conveniently by placing the electrode in the protein solution in the presence of iodoacetate.

If this is done there is a rapid initial liberation of iodide followed by a much slower reaction proceeding at only one thirtieth of the rate as shown in Fig. 1, curve A. If the inactivation of the enzyme is followed at the same time it is found that it exactly follows the rapid initial part of the curve and is complete when the iodide liberation reaction slows down. Extrapolation of the later part of the curve to the axis shows that the initial fast reaction corresponds to the liberation of two equivalents of iodide per mole of protein. This suggests that these two specially reactive thiols are located at the active sites of the enzyme and that there must be two such sites with one thiol at each. If both thiols were at one active site one would expect that the progress of inactivation would be faster than the iodide liberation reaction since removal of one of the pair should be enough for inactivation.

Study of the reaction with iodoacetamide over a range of pH values and at different salt concentrations shows that the reactivity of these thiols is unusual. Ordinary thiols vary in their reactivity with pH because the ionised form reacts much more readily than the unionised form. Moreover their reaction rate is affected by the salt concentration because of the charge on the ionised form. However, with creatine phosphokinase the rate is unaffected by the presence of salts and is constant over a pH range of 6 to 10! Nor do they react with the electrode as do simple thiols. All this strongly suggests that these two thiols in creatine phosphokinase must be hydrogen bonded to some base group in the protein. The most likely group, because of the pH data, is the imidazole group of histidine.

A comprehensive study of the effects of various combinations of the substrates and reaction products on the velocity of the reaction with iodoacetamide (Table 1) showed that the only combination to influence the reaction was the mixture of reactants and products obtained by allowing the reaction catalysed by the enzyme to proceed to equilibrium. This gave appreciable protection as can be seen from Fig. 1 and the Table. From this it seems probable that none of these molecules combines directly with the thiol at the active site although data of other workers show that binding of substrates to the protein does occur. One other important piece of information which must be reconciled with any proposed mechanism is the observation of Boyer and his co-workers that the

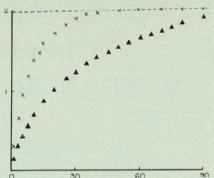


Fig. 1. Reaction of creatine phosphokinase with iodoacetate at 25°C.

x, Control experiment; A, plus substrateproduct-equilibrium mixture. Enzyme 4.6 M, iodoacetate 0.5 mM. Borate buffer, pH. 9.0 Ordinate: Moles iodide liberated per mole of enzyme. Abscissa: Time (mins.).

phosphate transfer occurs without any exchange with radiophosphate in the solution, i.e., is "direct" and, therefore, would be expected to be assisted by a pair of conjugate acid and base groups on the enzyme surface.

With these considerations in mind Rabin and Watts proposed that the reaction resulted from grouping the reactants about the thiol-histidine pair, using the magnesium to assist the holding of the ATP to the protein in the correct orientation. In this formation (Fig. 2) it can be seen that not only are the thiol and imidazole groups hydrogen bonded to one another, but the creatine is hydrogen bonded to the sulphur and the imidazole to the phosphate. In addition, one of the creatine nitrogens is brought within reacting distance of the terminal phosphorus atom of the ATP, and the whole structure forms a lightly bonded ring. A simple clockwise movement of bond electrons in this ring then transforms the structure into a second form. One phosphate is now attached to creatine, the sulphur has accepted a hydrogen from creatine, i.e., has acted as a base group, and the imidazole has donated a hydrogen to the second phosphate of ATP, i.e., has acted as an acid group. Hydrogen bonding remains to form a ring and the whole reaction can be reversed by a similar anti-clockwise movement of electrons.

The difficulties of testing this mechanism by further experiments led Dr. Watts and Mr. Virden to extend the study to the similar enzyme in lobster muscle which uses arginine instead of creatine. They were able to purify the enzyme to

a stage where it was electrophoretically homo-

Figure 2.

conformational change is of far greater import-

Protein

Preteir

The test of this must await further investigation. However, it can be seen that the comparative method provides a very powerful tool for testing hypotheses concerning the mechanism of enzyme action. Factors that would have proved extremely difficult to discover in the original test systems present themselves as major features on the basis of a few simple comparative tests. Species naturally available provide a vast, readily available set of "mutants" without the difficulties of having to produce and control them.

Effects of substrates on the reaction of creatine kinase with iodoacetamide at 25°.

	Relat	ive initial velocity*
pH	Substrates	Iodoacetamide
9.0	None (control)	1.00
9.0	Equilibrium mixture† + Mg ²⁺	0.66
9.0	Equilibrium mixture‡	1.05
9.0	Mg^{2+}	0.97
9.0	ATP	1.00
9.0	ATP + Mg ²⁺	1.00
9.0	ATP + creatine	1.07
9.0	Creatine	1.07
9.0	Creatine + Mg ²⁺	0.93
9.0	ADP	1.00
9.0	ADP + Mg ²⁺	1.01
7.0	Mg ²⁺	
7.0	ATP	1.00
7.0	$\Lambda TP + Mg^{2+}$	0.99
7.0	ADP	1.00
7.0	ADP + Mg ²⁺	1.00
7.0	Phosphocreatine	
7.0	Phosphocreatine + M	(g ²⁺ -

geneous and it then showed behaviour with iodoacetate and iodoacetamide exactly similar to that of rabbit muscle enzyme. However, unlike the creatine enzyme, which is not protected by creatine, the lobster enzyme is very strongly protected by small concentrations of arginine. By studying the variation of protection with the concentration of arginine and plotting the data in the form of a Lineweaver-Burke plot, the binding constant of the arginine can be shown to be 0.7mM. This is exactly the same as the Michaelis constant for the normal reaction as determined by Ennor and his collaborators in Australia and is strong evidence that arginine protects the enzyme against iodoacetate by occupying its own normal position at the active site. It may protect either by hydrogen bonding with the thiol to form a much more stable bond than does the imidazole or it may induce a conformational change in the protein so that the thiol becomes inaccessible, or both. There is some evidence from Samuels and co-workers in the United States that creatine kinase changes its conformation in the presence of creatine, ATP and Mg, so that arginine could well do the same. Its binding is much tighter than that of creatine so its effect might be greater.

Watts and Virden have now extended their investigations to a variety of other species of marine invertebrates, many of which have arginine phosphokinase. Preliminary results show that, although protection by arginine is widespread, it varies considerably in effectiveness. More surprising, however, is the finding that, among enzymes with approximately the same degree of activity as phosphokinases, the speed of reaction of the thiol group with iodoacetamide may vary over more than a ten fold range. Indeed, two species were found which did not appear to be susceptible to iodoacetamide inhibition. Thus the reactivity of the thiol in the resting enzyme may have very little to do with its catalytic efficiency and it may well be that the postulated

* Initial velocities are expressed relative to that of the control, which was taken to be 1.00.

Obtained by allowing the reaction mixture containing ATP (1 mM), creatine (10mM), and Mg2+ ion (1 mM) to proceed to equilibrium before the addition of the iodoacetamide.

‡ Approximate only; the reaction mixture contained ADP (0.5 mM), ATP (0.5 mM), phosphocreatine (0.7 mM) and creatine (5 mM).

THE EXCRETION OF INTRAVENOUSLY ADMINISTERED RADIO-ACTIVE VITAMIN B12

by F. Lees and M. J. L. Patterson

This is only a limited study. A more extensive survey is necessary before statistically significant conclusions can be drawn.

Introduction

The Schilling test,* which is used to estimate the absorption of orally administered radio-active vitamin B₁₂, is well known and widely used. (Schilling et al, 1955; Berlyne et al, 1957.)

An advantage of the test is that it can be used irrespective of previous treatment with vitamin B12. Similar tests of absorption which depend on measurements of serum levels, liver uptake or faccal excretions of radio activity do not differ essentially from the Schilling test. None of these methods measure deficiency of vitamin B12

Microbiological assay of scrum vitamin B12 (normal range 100-900µµg. per 100 ml.) is the present method of choice by which this can be done, though the method is not always available because of the technical difficulties involved and an alternative method would be useful.

Because of the possibility that serum vitamin B12 levels do not necessarily reflect total body content of the vitamin, the excretion of intravenously administered Co58 Vitamin B12 was studied.

TECHNIQUE

Exactly the same dose of radio-active vitamin, as used for oral Schilling tests, was given intravenously. A 24-hour excretion of urine was collected immediately after the dose. No "flushing" doses of cyanocobalamin were given. Normal meals were taken. There were no other special features in the test. A 24-hour excretion of urine was arbitrary and convenient. The material used was vitamin B12 Co58 freeze dried and stored until made up into solution ready for use. The usual specific activity of the material was from 1.15 μμg. to 1.92 uug. of vitamin B12. The dose given was about 1.0 µc. which means that the dose of vitamin B12 was of the order of less than 1.0 µg.

The urine of patients who had more than one test was screened for radio activity before the second or subsequent tests to make sure that urine counts had returned to background level. 10cc. samples of the 24-hour specimens of urine were measured in an annular scintillation counter, Ekco type N.550 A (Fig. 1), using a scaler, type N.530 F. The material was supplied in containers of 5μc. It was prepared by dilution of 20μc. with freshly distilled water to 110 ml. This was filtered through sintered glass and exactly 5 ml. of the solution was introduced into ampoules which were



Fig. 1. The scintillation counter in use.

sealed and then autoclaved at 5 lb. pressure for 30 minutes. The content of the ampoules was then examined under transmitted light before being passed for intravenous use. The same ampoules were also used for oral Schilling tests. Inactive vitamin B12 was not added to the radioactive material when it was made up into ampoules of 1.0µc.

Three groups of patients were tested. All were over forty-five years of agc.

Group 1-Normal Controls (16 patients)

There was no suspicion of vitamin B12 deficiency in these patients and none had anaemia, blood disease, gastro-intestinal disease or any condition associated with vitamin B12 deficiency.

The results of 24-hour urinary excretions are shown in Fig. 2. The average was about 9%, the highest 13%, and the lowest 7%.

Group 2-Normal Controls on Vitamin B12 Therapy (11 patients)

This group consisted of normal controls which, in addition to falling into group 1, had received

vitamin Bis as empirical treatment for disseminated sclerosis and such like conditions. The results of 24-hour excretions are shown in Fig. 2. The highest figures were found in those who had had large doses of vitamin B12 in hospital before the test. The average excretion was 18%, the lowest 11%, and the highest 36%, and one may consider that these results are to be expected in "saturated" patients.

% OF DOSE EXCRETED IN 24 HRS.

intramuscular vitamin B12 for many days, weeks

or months before the test and could be expected to

have tissues saturated with vitamin B12 or at least

could not be deficient. None had had pernicious

anaemia or any other condition associated with

vitamin B12 deficiency. They were all having

Group 3

OF

CASES

This was the abnormal group. The results of initial intravenous tests, repeated tests after vitamin B12 therapy and other data are recorded.

Addisonian Anaemia (7 patients)

Intravenous tests before treatment resulted in the values shown in Fig. 2 in the seven patients tested. Some of these had subacute combined degeneration of the spinal cord. One showed an excretion of 39% when re-tested five weeks after treatment.

Schilling test results were in a range of 0.75% to 2% in them all.

Serum vitamin B12 levels before therapy were in a range of 25 µµg, to 75 µµg, per ml. in six patients tested.

Conclusions

The excretion in the urine of intravenously administered vitamin B18 is generally lower (1.7%

to 7% than the normal range (7% to 12%) and much lower than the range in saturated patients (11% to 36%). There is a good correlation between serum levels (which are low) and the results of the intravenous tests.

Post gastrectomy Syndromes Hodakin's Disease

Controls on B12 therapy

Other Anaemias 1. One patient had iron deficiency anaemia with an excellent reticulocyte response after fer-

rous sulphate.

Addisonian Angemia

Controls

Before treatment the intravenous test showed an excretion of 1% of the dose—a very low result. But, after this a Schilling test was normal (4%). The vitamin B12 given produced a good reticulocyte response indicating that she was also deficient in vitamin B12-as suspected by the result of the intravenous test. Seventeen days later, when " saturated " with vitamin B12, she excreted 13 % of an intravenous dose.

This case illustrated how the intravenous test can be used as a diagnostic procedure.

2. A patient with megaloblastic anaemia due to Primidone, showed a result of 7% excretion after an intravenous test, this borderline result indicating a degree of unsaturation. Schilling test was normal (11%).

She responded to vitamin B12 as shown by a reticulocytosis and later, in the same way, to folic acid.

3. A patient with hypothyroidism due to Hashimoto's disease who had a macrocytic anaemia, excreted 13% of an intravenous dose. This is normal. She responded to thyroid, but not to vitamin B12.

Urine is collected for the following 24 hours and the percentage excretion is determined. This can be repeated with intrinsic factor and a return to normal is recorded in Addisonian anaemia.

^{*}The oral Schilling test is an index of satisfactory absorption from the bowel of vitamin B12. The technique consists of the oral administration of 0.55 µg. Co.50 labelled cyanocobalamin followed by a flushing dose of 1000 ugs. two hours later by intramuscular injection.

Post-gastrectomy Deficiency Syndromes (4 patients)

Two patients with microcytic anaemia after partial gastrectomy for peptic ulcers, showed intravenous test excretions of 4% and 5.5% (both low). One showed a definite response to Vitamin B12 therapy.

Another patient with a macrocytic anaemia after partial gastrectomy showed an excretion of 0.9% of the intravenous dose (very low). His serum level was 175µµg./ml. The Schilling test result showed results of 3.4% and 8%, before and after intrinsic factor (oral tests).

Another patient with a serum level of 20 µµg./ml. after sub-total gastrectomy excreted 6.5% of an intravenous dose.

Comment

All those with post-gastrectomy anaemia excreted less than the normal after an intravenous dose, even though vitamin B12 deficiency was unsuspected in some.

Hodgkin's Disease (2 patients)

A man with Hodgkin's disease excreted 4.5% of an intravenous dose and when tested again, 3.5%. Later, after treatment with vitamin B12 he excreted 30% of an intravenous dose. The first two results were a surprise to us because they indicated unsaturation (retention of the B12) though the marrow showed normoblastic erythropoiesis and there was no macrocytosis.

Another patient with Hodgkin's disease excreted only 5% after an intravenous dose and yet, his serum vitamin B12 level was normal (425µµg./ml.) and his Schilling test result was normal (26%). The marrow erythropoiesis was normoblastic.

Comment

These results in Hodgkin's disease are interesting and worthy of further study. They may indicate tissue B12 unsaturation in spite of other negative evidence of deficiency.

It is possible that blood levels of vitamin B12 in this disease are not a reflection of tissue levels. The serum levels may be high because of fixation of B13 to protein.

It is known that megaloblastic changes occur in the marrow in some patients suffering with this disease. The intravenous test may be the best test for tissue unsaturation.

Multiple Myelomatosis

A similar low excretion (6.5%) was found after the intravenous test in a patient with myelomatosis. The serum level was normal (135 µµg./ml.).

Hypopituitarism

A gross discrepancy between the serum B12 level (65 µµg./ml.) (very low) and intravenous test result (13% excreted-normal) in one patient. The reason for this is not known, but it indicates that further knowledge might accrue if such results are followed up.

SUMMARY OF MAIN RESULTS

Urinary excretion of vitamin B12 in first 24 hours of urine as a percentage of intravenous

- 1. Control Cases: 7% to 12%
- Control Cases having Vitamin B12: 11% to 36%
- Untreated Addisonian Anaemia: 1.7% to
- Post-gastrectomy Syndromes: 0.9% to
- 5. Hodgkin's Disease: 3.5% to 5%

CONCLUSIONS

We conclude from these results that: -

- 1. The test indicates whether tissue deficiency of vitamin B12 is present.
- 2. The test is an alternative to the estimation of serum B12 in some cases, but that the correlation is not always as expected.
- 3. Serum levels may not always reflect tissue levels of B12.
- 4. The test may point to tissue B12 deficiency even when the usual clinical signs are absent. In these experiments the part played by indivi-

ual tissues an organs (e.g. kidney) in determining how much Vitamin B12 escapes in the urine has not been studied.

ACKNOWLEDGEMENTS

We wish to thank Dr. F. R. Ferguson, of the Manchester Royal Infirmary, and Dr. J. W. Aldren Turner and Dr. R. Bodley Scott, of St. Bartholomew's Hospital, for their help in this work in allowing us to study their patients.

Also Miss Joan McAllister, of the Isotope Laboratory, St. Bartholomew's Hospital.

REFERENCES

Schilling, R. F., Chatanoff, D. V., and Korst, D. R. (1955). J. Lab. Clin. Med., 45, 926. Berlyne, G. M., Liversedge, L. A., and Emery, E. W (1957). Lancet, 1, 294.

CURRENT INVESTIGATIONS AND RESEARCH PROIECTS IN THE HOSPITAL

Mr. A. H. Hunt's Firm

Portal hypertension: various aspects. (A. H. Hunt.) Assessment of liver function and the metabolic disorders of liver disease by biochemical methods, before and after venous shunt operations. (A. H. Hunt with E. J. Knight.)

Statistical review of 500 cases of portal hypertension.

(A. H. Hunt with P. Knipe.) Extrahepatic portal obstruction: a clinical and radiological study, and assessment of the results of treatment. (A. H. Hunt with L. J. Chalstrey and

P. Knipc.)
Ammonia tolerance before and after porta-caval anastomosis. (A. H. Hunt with J. C. B. Fenton.) Investigation of the heavy metal content of livers by activation spectroscopy: a chemical, histological and clinical analysis to determine or exclude relationship between heavy metals, cirrhosis and carcinoma. (A. H. Hunt with R. M. Parr, Ph.D., N. G. Trott, Ph.D. and D. M. Taylor, Ph.D.) Investigation of the causes of hepatic vein obstruction

its clinical manifestations and treatment. (A. H.

Hunt with W. R. O'Flynn.) Clinical survey of cancer of the stomach. (J. O. Robinson, M.D.)

Isolated mammalian liver perfusion. (P. Knipe.)

Recent Papers by Bart's Men

*Abercrombie, G. F. So far, so bad. Lancet, Oct. 19, 1963, pp. 824-826.
*Badenoch, A. W. Advances in urology. Practitioner,

191, Oct., 1963, pp. 460-464.

Blunt, M. J. Intraneural branches of the central retinal artery. Brit. J. Ophthal., 47, Nov., 1963, pp. 664-665.

-, and others. A museum stereoscope for discmounted transparencies. Med. bio! Ill., 13, July, 1963, pp. 192-195.

Borrie, P. Xanthomatosis. Nurs. Mirror, Sept. 20,

1963, pp. x-xii. Boughton, Barbara, (with others). A factor capable of increasing vascular permeability present in tymph node cells; a possible mediator of the delayed reaction. Immunology, 6, Sept., 1963, pp. 484-

Buckle, R. M. Blood pyruvic acid in thalidomide neuropathy. Brit. med. 7., Oct. 9, 1963, pp. 973-

-. The glyoxylic acid content of human blood and its relationship to thiamine deficiency. Clin. Sci.,

25, 1963, pp. 207-217. Chrispin, A. R., (and others). The radiology of obliterative pulmonary hypertension and thromboembolism. Brit. F. Radiol., 36, Oct., 1963, pp.

Cotes, J. E., (and others). Effect of breathing oxygen upon cardiac output, heart rate, ventilation, systemic and pulmonary blood pressure in patients with chronic lung disease. Clin. Sci., 25, 1963, pp. 305-321.

*Cull, P. G. Communication and the universities. Med. biol. Ill., 13, Oct., 1963, pp. 238-239.

Dale, Sir Henry, Fifty years of medical research.

Brit. med. J., Nov. 23, 1963, pp. 1287-1290.

Dangerfield, W. G., see King, R. C., and others.

Darmady, E. M., (and Moore, R. G.). The Portsmouth

Medical Society and Medical Centre. Postgrad. med. 7., 39, Nov., 1963, pp. 631-633.

Dobree, J. H., see King, R. C., and —; and King,

R. C. and others

*Ellis, George. Halothane "fluothane" in a closed circuit with a reference to emergency surgery. Acta Anaesth. Belg., 14, 1963, pp. 160-163.

Flavell, A. N., see O'Grady, F., and others.
Flavell, G. Thoracic injuries. Proc. roy. Soc. Med., 56, Sept., 1963, pp. 822-824.
*Fletcher, C. M. Epidemiologist and clinical investigator. Proc. roy. Soc. Med., 56, Sept., 1963, pp.

*Fowler, J. F. Solid-state dosimeters for in-vivo measurements. Nucleonics, 21, Oct., 1963, pp. 60-64.

Solid state dosimetry. Phys. in Med. Biol., 8,

April, 1963, pp. 1-32. Franklin, A. White. Telling the family. Nurs. Mirror, Nov. 1, 1963, pp. 117-120.

—, (with others). Congenital cataracts, renai

tubular necrosis and encephalopathy in two sisters. Arch. Dis. Childh., 38, 1963, pp. 505-515.

*Hadfield, Geoffrey. The tissue of origin of the fibrob'asts of granulation tissue. Brit. 7. Surg., 50, Sept., 1963, pp. 870-881. *Hector, Winifred E. Drug treatment. Nurs. Times,

Oct. 25, 1963, pp. 1356-1357.

—. Programmed learning. Nurs. Times, Sept. 13,

1963, pp. 1146-1147. Holt, Maisie. Word blindness in children. Nurs. Mirror, Sept. 13, 1963, p. 505.

*Howell, T. H. Admissions and discharges in a geriatric unit. Hospital, August, 1963, pp. 2-4

Causes of death in nonagenarians. Geront. Clin., 5, 1963, pp. 139-143.

*----, (with Xuereb, C.). Triamterene (Dytac) in the treatment of congestive cardiac failure in geriatric patients. Med. Proc., 9, June, 1963, pp. 260-264. Hubble, D. V. Diagnosis and management of coeliac

disease in childhood. Brit. med. J., Sept. 21, 1963, pp. 701-706. -, (and Littlejohn, Sheila). The D-xylose excre-

tion test in coeliac disease in childhood. Arch. Dis. Childh., 38, 1963, pp. 476-480.

*Hunter, R. A. Psychotic episodes precipitated by systemic disease. Lond. Clin. med. J., 4, July, 1963, pp. 33-36.

-, and others. Temporal lobe epilepsy supervening on long standing transvestism and fetishism. Epilepsia, 4, 1963, pp. 60-65.

Huntsman, R. G., and others. Blood groups and enzymes of human red cells after two years' storage in liquid nitrogen. Brit. med. 7., Nov. 23, 1963,

p. 1315. see also Lehmann, H., and -

Hurn, B. A. L., see Huntsman, R. G., and others.
*Jopling, W. H. Leprosy and its management in

Britain. Lond. Clin. med. J., 4, July, 1963, pp. 47-54.

*King, R. C., and Dobree, J. II. Corn oil in the treatment of exudative diabetic retinopathy. Proc. roy. Soc. Med., 56, August, 1963, pp. 759-760.

-, and others. Exudative diabetic retinopathy.

Brit. 7. Ophthal., 47, 1963, pp. 666-672.

*Kok, D'A. Cholesterol: "corn oil" diet in diabetic retinopathy. F. Coll. gen. Pract., 6, May, 1963,

Suppl. 2, pp. 24-28. -, (with others). Ocular pathology in macro globulinaemia. 7. Path. Buct., 86, Oct., 1963, pp.

453-461. see also King, R.C., and others.

*Lambley, D. G. Intermittent claudication due to cystic degeneration of popliteal artery. Brit. med. 7., Oct. 5, 1963, pp. 849 850.

*Lees, F., and Watkins, Sylvia M. Loss of consciousness in migraine. Lancet, Sept. 28, 1963, pp.

*Lehmann, H. Haemoglobinopathies. Proc. roy. Soc.

Med., 56, July, 1963, pp. 569-572.

— (with Singer, R.) The haemoglobins of (with Singer, R.) Africander cattle. Man and Cattle. Proceedings of a Symposium on Domestication. Edited by A. E. Mourant and F. E. Zeuner, 1963, pp. 119-125.

-, (with others). Harris and Whittaker's pseudocholinesterase variant with increased resistance to fluoride. Acta genet., Basel, 13, 1963, pp. 95-108. -, and Huntsman, R. G. Haemoglobin and myoglobin. In, Comprehensive biochemistry,

edited by M. Florkin and E. H. Stotz. Vol. 8. 1963. Ch. 1, Section D, pp. 54-74.

*Lindop, Patricia J., and Musgrove, J. R. A remotecontrol apparatus for irradiation of mice and rats. *Phys. in Med. Biol.*, 8, Sept., 1963, pp. 325-331.

—, and Rotblat, J. The age factor in the sus-

gentibility of man and animals to radiation. Brit. 9. Radiol., 35, 1962, pp. 23-31

—, and Rotblat, J. Dependence of radiation.

induced life-shortening on dose-rate and anaesthetic. Symposium on cellular basis and aetiology of late somatic effects of ionizing radiation, 1962, pp. 313-318.

-, (with others). Oxygen washout studies in the anaesthetized dog. J. appl. Physiol., 18, Sept., 1963, pp. 888-894.

Lofts, B., (with Van Oordt, P. G. W. J.). The effects of high temperature on gonadotrophin secretion in the male common frog (rana temporaria) during autumn. T. Endocr., 27, Nov., 1963, pp. 137-146.

McMenemey, W. H. On medical history and literature. Proc. roy. Soc. Med., 56 Sept., 1963, pp.

-, see also Hunter, R. A., and others.

Mears, S. B. Ankylosing spondylitis, complicated by corticosteroid therapy. Nurs. Times, Oct. 25,

corticosteroid therapy. Nurs. 11mes, Oct. 23, 1963, pp. 1351-1353.

Misiewicz, J. J., (with others). Observations on the clinical use of radio pills. Brit. med. 7., Sept. 28, 1963, pp. 771-774.

Musgrove, J. R., see Lindop, Patricia J., and —...

*Newill, R. G. D. Epidemic cervical myalgia. J. Coll. gen. Pract., 6, 1963, pp. 344-346.

Nicol, C. S. Diagnostic tests for syphilis. Curr. Med. Drugs, 4, Oct., 1963, pp. 14-28.
*Norman-Taylor, W., (and Rees, W. H.). Blood pres-

sures in three new Hebrides communities. Brit. J.

Sures in three new Herricas communities. But. J. Prev. soc. Med., 17, July, 1963, pp. 141-144.

*O'Connell, J. E. A. Siamese twins. Trans. and Soc. Lond., 79, 1962-63, pp. 111-116.

*O'Grady, F., (and Riley, R. L.). Experimental airborne tuberculosis. Adv. Tuberc. Res., 12, 1963, pp. 150-190.

-, (and Thompson, R. E. M.). Container for

— (and Hiolipsoli, R. E. 197.). Container for central sterile supply of instruments. Lancet, March 10, 1963, p. 576.
— (and Wittstadt, F. B.). Nasal carriage of snaphylococcus pyogenes. I. Amer. J. Hyg., 75, 1962, pp. 136-145.

*—, and others. A case of human infection with Dirofilaria (Nochitella) sp. probably of African origin. 7. Helminth., 36, 1962, pp. 309-312.

*—, (and others). The effect of griseofulyin on

candida albicans lesions in mice. Brit. 7. exp.
Path., 44, June, 1963, pp. 334-338.

*—, (and others). Variability of the intrathecal

response to antigens. J. Path. Bact., 83, 1962, pp.

-, (with others). An easily sterilised disposable substitute for mackintosh sheeting. Lancet, Oct. 19, 1963, pp. 826-828.

-, (with others). Infectiousness of air from a tuberculosis ward. Amer. Rev. resp. Dis., 85, 1962, pp. 511-525.

-, see also Shooter, R. A., and others.

Oswald, N. C., (with Horder, J.). The acute chest.

Med. Wld., 99, Sept., 1963, pp. 380-387.

*Painter, N. S. The effect of morphine in diverticu-

losis of the colon. Proc. roy. Soc. Med., 56, Sept.,

Parker, Phyllis M. The ward sister's view. Nurs. Times, Oct. 25, 1963, pp. 1355-1356.

*Partington, M. W., ed. Retropharyngeal abscess. Clin. Pediatrics, 2, June, 1963, pp. 307-313.

*Perkins, E. S., (and Wood, R. M.). Antigenic components of guinea-pig tissues. Exp. Eye Res., 2, 1963, pp. 255-264.

-, (with Gloster, J.). The validity of the Imbert-

Fick Law as applied to applanation tonometry. Exp. Eye Res., 2, 1963, pp. 274-283.
Pollock, A. M. The management of ankylosing spondylitis. Nurs. Times, Oct. 25, 1963, pp.

Potter, J. M. Survival after serious head injury. Proc. roy. Soc. Med., 56, Sept., 1963, pp. 824-

*Robinson, J. O. Pilonidal sinus. Lond. Clin. med. J.,

4, Jan., 1963, pp. 33-40.

—, (and Rice, H. M.). A non-adherent surgical dressing. Practitioner, 191, Nov., 1963, pp. 678-

*Rosborough, D. Malignant mixed tumours of skin. Brit. J. Surg., 50, 1963, pp. 697-699.

*Rotblat, J., and Simmons, J. A. Dose response relationship in the yield of radiation-induced free

radicals in amino acids. Phys. in Med. Biol., 7, 1963, pp. 489-497.

*—, and Simmons, J. A. Electron spin resonance studies of thermal effects in irradiated amino acids. Phys. in Med. Biol., 7, 1963, pp. 499-504.

—, see also Lindop, Patricia J., and —.

*Rothnie, N. G., and Taylor, G. W. Sutureless skin

closure. Brit. med. 7., Oct. 26, 1963, pp. 1027-

Rothwell-Jackson, R. L. Idiopathic large-bowel obstruction. Brit. J. Surg., 50, Sept., 1963, pp.

Scowen, E. F., (with others). Primary hyperoxal-uria. Lancet, Nov. 23, 1963, pp. 1096-1097. *Sen Gupta, H. M., and others. The scattering of 29

MeV 3He-particles by 14N and 16O nuclei. Nuclear

Phys., 38, 1962, pp. 361-371.

Shooter, R. A., and others. Isolation of patients in hospital. Brit. med. 7, Oct. 12, 1963, p. 924.

Simmons, J. A., see Rotblat, J. and

Spector, W. G., and Willoughby, D. A. The antagonism of substances that increase vascular permeahility in the rat. J. Path. Bact., 86, Oct., 1963, pp.

-, and Willoughby, D. A. The inflammatory response. Bact. Rev., 27, June, 1963, pp. 117-

134.
Stack, H. G. A study of muscle function in the fingers. Arris and Gale Lecture, 1963. Ann. roy. Coll. Surg. Engl., 33, Nov., 1963, pp. 307-322.
Taylor, G. W., see Rothnie, N. G., and Thorne, Napier. The skin clinic. Brit. 7. clin. Pract., 17, Oct., 1963, pp. 607-610.

-. The treatment of psoriasis with fractionated tar and lecithin. Brit. J. Derm., 75, Nov., 1963,

pp. 422-427.
*Theobald, G. W. Induction of labour. In, Kellar, R. J., ed. Modern trends in obstetrics, 1963. Ch. 6. Pp. 87-103.

The significance of a name. Irish 7. med.

Sci., 1963, pp. 51-54.

*——. The synthesis of divergent observations concerning oxytocin. Oxytocin: Proceedings of an International Symposium, 1959. Edited by R. Caldeyro-Barcia and T. Heller. 1961.

*——, (with Lundborg, R. A.). Changes in limb volume

and in venous infusion pressures caused by pregnancy. J. Obstet. Gynaec. Brit. Comm., 70, June, 1963, pp. 408-421.

-, (with Lundborg, R. A.). Changes in limb volume and in venous infusion pressures associated with pregnancy. J. Physiol., 168, 1963,

*—, (with others). The antidiuretic effect of oxytocin in man. 7. Physiol., 168, 1963, pp. 16-17. Thould, A. K.; (with others). Tristan da Cunha: general medical investigations. Brit. med. 7., Oct.

Zo, 1963, pp. 1018-1024.

Trappell, D. H. The peripheral lymphatics of the lung. Brit. 7. Radiol., 36, Sept., 1963, pp. 660-

*Turner, P. Renal biopsy in a general hospital. J. clin.

Path., 16, 1963, pp. 448-451.
Warcham, Truda. Physiotherapy for ankylosing spondylitis. Nurs. Times, Oct. 25, 1963, p. 1354.

*Waterworth, Pamela M., (with others). A comparison of four phenoxypenicillins. Brit. med. 7., Oct. 19, 1963, pp. 956-961.

Watkins, Sylvia M., see Lees, F., and -Wattis, R. W. E., (with others). Primary hyperoxal-uria. Lancet, Nov. 23, 1963, pp. 1096-1097. Wendell-Smith, C. P., see Blunt, M. J., and others.

Willoughby, D. A., see Spector, W. G., and -

*Reprints received and herewith gratefully acknowledged. Please address this material to the Librarian.

ST. BARTHOLOMEW'S HOSPITAL JOURNAL

CLINICAL AND RESEARCH SUPPLEMENT

CONTENTS

Circulating Malignant Cells by A. J.

Supplement No. 6

Vol. LXVIII, April, 1964

CIRCULATING MALIGNANT CELLS

By A. J. Salisbury

Introduction

Malignant tumours may spread in four ways: by direct infiltration of neighbouring tissues, by extension along lymphatic channels, by transport in the bloodstream, and by implantation. It is likely that the majority of distant metastases are a result of bloodborne spread of tumour cells. As long ago as 1829 Cruveil-hier appreciated the relationship between metastases and the infiltration of blood vessels by a primary malignant tumour, and suggested that a specific cancerous juice, liberated by the tumour, passed in the bloodstream to give rise to metastases The modern view that such metastases follow the transport of viable malignant cells in the blood, was postulated by Lomer² in 1883, and von Recklinghausen³ in

Since blood taken from a patient with malignant disease might be expected to contain cancer cells in transit from the primary tumour to a site of metastasis it would seem reasonable to examine blood films from such a patient for malignant cells. However, recent quantitative studies suggest that circulating malignant cells rarely occur in numbers greater than ten in each millilitre of blood. So few cells are most unlikely to be detected amongst millions of red and white blood cells. The occasional cases in which malignant cells have been found in unconcentrated blood films from living patients 4, 5, 6, 7, 8 must, therefore be regarded as exceptional.

It has long been appreciated that some method must be developed of concentrating malignant cells in blood before the detection of circulating cancer cells would be practicable. The simplest way of achieving this end is to remove red blood cells, and possibly leucocytes, from the preparation. Pool and Dunlop9 attempted in 1934 to hæmolyse erythrocytes in blood from patients with malignant disease by treatment with acetic acid. Sections were made of the remaining white blood cells and possible malignant cells. Unfortunately, malignant cells were difficult to identify, and similar cells were found in a case of benign gastric ulcer. The examination of blood for malignant cells therefore lapsed until the work of Papanicolaou 10, 11 on exfoliative cytology led to improved staining techniques and the definition of criteria for the identification of individual cells or small clusters of cells as malignant. Definite cancer cells were found in washings from excised speciments of carcinoma of the colon in 195412, and, in the following year, Engell¹³ produced his important work on the presence of malignant cells in peripheral blood. From this time the systematic examination of blood for cancer cells has taken place, and the amount of literature upon this subject is now formidable.

Methods of Obtaining Concentrates of Circulating Cancer Cells

Two ideals should be achieved in a successful method for concentrating malignant cells in blood. One is a high recovery of malignant cells, with maximum removal of red and white blood cells. The other is the preservation of good morphology of malignant cells. Unfortunately, the two ideals are mutually irreconcilable; means of concentration resulting in the greatest recovery of cancer cells tending to lead to the poorest morphology, and vice versa. In my opinion, it is useless to employ a method resulting in high recovery of malignant cells, if, by so doing, the appearance of the cells is impaired to such an extent that it is impossible to identify them. The first consideration must be reasonable morphology, with the degree of recovery as a secondary

Methods for the concentration of circulating cancer cells may be classified into four main groups:

- (1) Centrifugation:
- (2) Centrifugation at an interface:
- (3) Accelerated sedimentation of red blood cells:
- (4) Hæmolysis.

Centrifugation

This method is based upon the variation in specific gravity between cancer cells and normal blood elements. If blood be centrifuged its constituents become arranged in successive layers, from the bottom upwards, of red blood cells, white blood cells, platelets and plasma. Theoretically, any malignant cells should lie in the zone between white blood cells and platelets and cells in this area can be removed by careful pipetting and films made of them. The prolonged centrifugation at high speeds may lead, however, to considerable cellular distortion, and the degree of recovery of cancer cells is very poor. This method has rarely been used in the systematic examination of blood for malignant cells.

Centrifugation at an Interface

The variation in specific gravity between cells also forms the basis of this method. which was developed from the observation that normal red blood cells could be separated from malarial red blood cells by centrifugation over albumen¹⁴. If blood containing cancer cells is layered over an albumen solution of the correct specific gravity and centrifuged at a certain speed, red and white blood cells should pass to the bottom of the centrifuge tube. while malignant cells should accumulate at the interface between plasma and albumen. However, some experiments have suggested that cancer cells can be found at the bottom of the tube and be absent from the interface The preparation of albumen solutions of the correct specific gravity involves considerable technical difficulty and cells tend to stain poorly after prolonged contact with albumen.

Accelerated sedimentation of red blood cells

An observation by Gray and Mitchell¹⁵ that the addition of fibrinogen to heparinised blood caused red blood cells to form rouleaux and sediment so rapidly that they approached the packed cell volume at the end of one hour. led to the development of this method. The supernatent plasma contained a suspension of leucocytes and any cancer cells, and could be centrifuged to yield a preparation free from red blood cells. Certain objections to the use of fibrinogen, including the formation of fibrin clots in which nucleated cells could become enmeshed, led to the alternative use of dextran by Alexander and Spriggs16. Other agents which may be used to accelerate sedimentation of red blood cells include phytohæmagglutinin and polybrene.

Although there is evidence that the dextran method leads to variable recovery of malignant cells, some cells being trapped by the sedimenting erythrocytes and carried to the bottom of the tube, excellent morphology is obtained, both of cancer cells and of normal blood cells. The preservation of morphology greatly facilitates indentification of malignant cells, and, after testing several other methods, I employ this method almost exclusively. In addition, sedimentation with dextran has the advantage of being both cheap and simple.

Hæmolysis

Hæmolysis may be effected by several agents. Acetic acid has already been mentioned in connection with the work of Pool and Dunlop9, but its use leads to grave impairment of cell morphology.

Streptolysin "O", an enzyme elaborated by the streptococcus, has the advantage of lysing granulocytes as well as red blood cells. Thus, the final preparation contains only mononuclear blood cells and cancer cells. Incubation of blood with Streptolysin "O" was first employed by Malmgren and his colleagues17. The cells remaining after incubation may be smeared onto slides, or collected on a "Millipore" filter. This is a cellulose acetate membrane with pores 5p in diameter, which allow fluid and debris to pass through, but which retain nucleated cells, including any cancer cells. The membrane is inert, and can be fixed, stained and mounted on a slide as though it were a section.

Incubation with Streptolysin "O" should theoretically give complete recovery of malignant cells. However, I have tested this method and found that it led to considerable distortion in cancer cells. Other authorities have reported the malignant cells may be completely stripped of cytoplasm following incubation. The enzyme is also extremely expensive and therefore unsuitable for regular use. Filtration with "Millipore" membranes involves certain technical difficulties, and staining of malignant cells tends to be irregular. Nevertheless. I have found the use of "Millipore" filters of great value in the isolation of malignant cells from large volumes of fluid.

Saponin was used as a hæmolytic agent in the original experiments of Engell13, and has more recently been employed in a very sophisticated technique developed by Kuper and his colleagues18. A suitable grade of powdered iron is added to heparinised blood, and the mixture is left to stand whilst phagocytosis of iron takes place. Saponin is then added to hæmolyse erthrocytes, and a strong permanent magnet is passed through the blood, thereby removing iron-containing granulocytes and monocytes. The remaining fluid containing lymphocytes and any cancer cells, is passed through a "Millipore" filter. Recently, Kuper19 has elaborated this method still further by detecting tritiated thymidine uptake in malignant cells by means of autoradiographs.

Accelerated sedimentation of red blood cells

The appearance of carcinoma cells

The appearance of cancer cells in blood concentrates will vary according to the staining technique used, the method of concentration, and the method of fixation. However, malignant cells are subject to the same criteria for malignancy (laid down by Papanicolaou^{10, 11}) as similar cells in various effusions. Since carcinoma cells are usually found to be arranged individually in peripheral blood, the principal criteria for malignancy are that the cells should be considerably larger than any cells normally found in the blood, the nuclearcytoplasmic ratio should be reduced or inverted, the nucleus should contain an increased amount of chromatin with an aberrant chromatin pattern and nucleoli should be large. prominent and frequently multiple.

Identification is facilitated if clusters of circulating cells are found. The degree of preservation of such cells is frequently greater than that of individual cells. In addition it is often possible to observe variations in the size of cells and their nuclei, irregularity of pattern,

and mitotic polypoid cells.

Figures 1 and 2 illustrate the variation in appearance presented by circulating cells in two different types of carcinoma of the breast. These samples were obtained during operative manipulation when clusters of cells are frequently found in peripheral blood.

One must stress that cells cannot be identified as malignant unless non-malignant cells of similar appearance can be excluded with certainty. Any case in which identification is

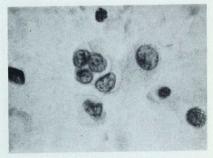


Fig. 1. Peripheral blood during operative manipula-–spheroidal cell carcinoma of the breast. Magnification × 1,000. Papanicolaou.

Fig. 2. Peripheral blood during operative manipulation—adenocarcinoma of the breast. Magnification × 1.000. Papanicolaou

doubtful must be regarded as negative. It is frequently of great help if carcinoma cells in blood can be compared with cells obtained from malignant effusions in the same patient, or with smears of the primary tumour. However, one must bear in mind that circulating cancer cells may differ considerably in appearance from cells in other sites.

The description of malignant cells in the paragraphs above applies only to circulating cells in cases of carcinoma. The appearance of cancer cells in other types of malignant disease will be mentioned in a subsequent section.

Benign Circulating Cells

Even if normal blood elements be excluded, non-malignant circulating cells can be found in peripheral blood concentrates in considerable variety. In some cases differentiation from malignant cells may occasion much difficulty.

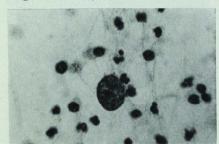


Fig. 4. Peripheral blood—naked megakaryocyte nucleus. Magnification × 500. May-Grünwald-Giemsa.

This is especially so, unfortunately, in cases of malignant disease, since it has been shown that non-malignant "atypical" cells occur in far greater numbers in the blood of patients with cancer than in normal subjects ^{20, 21}. These cells are probably an expression of tissue reaction to the cancer.

The three main classes of non-malignant circulating cells (excluding normal blood cells) are as follows:

- (1) Blood cell precursors;
- (2) Non-hæmopoietic cells;(3) Cells normally found in the blood, but of "atypical" appearance.

(1) Blood cell precursors

Megakaryocytes and megakaryocyte fragments are the cells most likely to be confused with malignant cells. They can occur in un-

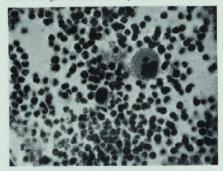


Fig. 3. Peripheral blood—megakaryocytes.

Magnification × 500.

May-Grünwald—Giemsa.

concentrated blood films, and have been found in concentrates from 42 per cent to 100 per cent of normal subjects. Although mature megakaryocytes (Fig. 3) and naked megakaryocyte nuclei (Fig. 4) present a characteristic appearance, immature megakaryocytes (Fig. 5) may closely resemble clusters of malignant cells or a multinucleate cell. One must resort to the finer points of cytology to distinguish such immature cells, and occasionally the differentiation is impossible.

Immature white blood cells, usually neutrophil myelocytes, are frequently found in concentrates from normal subjects, but can be identified with ease. Red cell precursors may also be seen.

(2) Non-hæmopoietic cells

Epithelial, endothelial and mesothelial cells may occasionally be found in concentrates of

blood. They are introduced into the specimen during venepuncture. The cells often occur in clusters, almost invariably in the form of flat sheets with irregular edges. Their cytoplasm is plentiful, with a "ragged" margin, and their nuclei do not resemble those of malignant cells.

Ostcoblasts and ostcoclasts have been reported in peripheral blood concentrates on rare occasions, and trophoblast cells have been detected in blood from the broad ligament veins during pregnancy.

(3) Cells normally found in the blood, but of "atypical" appearance

The majority of these cells are monocytes with a larger nucleus than usual, and an absence of nuclear indentation. Such cells are frequent in cases of malignant disease and a typical example is shown in Fig. 6. "Atypical" monocytes can almost always be distinguished from malignant cells by their smaller size, and the lack of any malignant characteristics within their nucleus

Plasma cells are also more frequently found in blood from cases of malignant disease, than from normal subjects. Their incidence and numbers will be discussed in the section on myelomatosis.

An excellent article on the appearance of non-malignant circulating cells is that of Alexander and Spriggs¹⁶.

Staining techniques

No single staining technique is ideal for the examination of peripheral blood concentrates. Carcinoma cells are best identified with a Papanicolaou stain, whereas circulating cancer cells in other types of malignant disease, such as the reticuloses and myelomatosis, appear most characteristic with a Romanowsky stain, such as May-Grünwald-Giemsa stain. Similarly epithelial and endothelial cells are more easily identified with the Papanicolaou stain, megakaryocytes and "atypical" monocytes with May-Grünwald-Giemsa. It therefore seems advisable to employ more than one staining method for the best results and the optimum identification of malignant cells. One qualification must be that there is little advantage to be gained by multiple staining methods if the observer is not experienced in the morphological appearances produced by such stains. Recently, Herbeuval and his colleagues²² have stressed the value of several means of staining including the use of histochemistry and immunofluorescence. When "Millipore" filters are used an undesirable coloured background is minimised if weak



Fig. 5. Peripheral blood—immature megakaryocyte
Magnification × 2,000.
Papanicolaou.

solutions of hæmatoxylin and eosin are employed for staining.

Circulating Malignant Cells

-Results of Investigations

Information on circulating malignant cells has accumulated largely in the last few years. Results differ considerably. This is not surprising when one considers the variation in the type of malignant tumour, its site, degree of differentation and spread; the presence or absence of venous invasion and any external factors influencing bloodborne metatasis; the volume of blood taken, its volume, and the site from which it was removed; the degree of recovery according to the concentration method used; and the strictness of standards applied to the identification of malignant cells.



Fig. 6. Peripheral blood—'atypical' monocyte.

Magnification × 1,000.

Papanicolaou.

The bulk of our knowledge is related to the incidence of malignant cells in cases of carcinoma. I therefore propose to consider this subject in detail, and to refer to other cases of malignant disease at the end of this section.

Carcinoma-Incidence and numbers of circulating cells.

In a large number of papers the incidence of circulating carcinoma cells in blood taken from the antecubital vein has ranged from 5% to 39%. In my own series of 200 cases of carcinoma the incidence was 8.5%. The majority of reports of a high proportion of cases positive for circulating carcinoma cells were published in the early days of concentration techniques and the examination of blood for malignant cells. Many authorities now consider that these figures were falsely high, and that 'atypical' benign cells were also classified as malignant.

There is some evidence, unfortunately incomplete, that the incidence of circulating cancer cells is increased if serial samples of blood are taken, and is even higher with single

large blood samples of 100ml.23

The number of circulating carcinoma cells is usually small, and rarely exceeds ten in each millilitre of blood. In blood taken from the antecubital vein I have never found more than eighteen malignant cells in a 4ml, sample of blood. The highest recorded number is that of Fleming²⁴, who observed 2,600 malignant cells per ml. of blood taken from the saphenous vein during nailing of a pathological fracture of the femur.

> Carcinoma—The site from which blood is taken.

The majority of reports on this subject agree that the incidence of carcinoma cells in local venous blood draining a tumour is considerably higher than in peripheral venous blood. For example, Potter and Malmgren²⁵ found cancer cells in 54% of specimens of local blood, as opposed to 24% of specimens of peripheral blood. These findings are to be expected, since many cancer cells present in local venous blood must become impacted in pulmonary and hepatic capillary beds before reaching the peripheral circulation. Arrest of cells in the liver was demonstrated by Fletcher and Stewart²⁶ in cases of carcinoma of the gastrointestinal tract. Blood taken from the portal vein contained malignant cells in 89% of cases, but hepatic vein blood contained cells in only 22% of cases.

Not only is the incidence of circulating cancer cells raised in local venous blood, but the numbers of cells may show up to a ten-fold increase over peripheral blood, and clusters of malignant cells are much more frequent.

Carcinoma—Relation of type of tumour to circulating cells.

Most information suggests that circulating malignant cells occur more frequently in cases of adenocarcinoma than in cases of squamous cell carcinoma. I found malignant cells in blood from the antecubital vein in 17 of 158 cases of adenocarcinoma, but none in blood from 37 patients suffering from squamous cell carcinoma. Nevertheless, cancer cells have been found in considerable numbers in local venous blood from cases of untreated squamous cell carcinoma of the cervix and from squamous cell carcinoma of the head and neck27. It is difficult to correlate the presence of these cells in blood with the fact that bloodborne metastases are rare in cases of squamous cell carcinoma. It is possible that there is a biologically decreased potentiality of such cells to produce metastases. Alternatively, the bloodborne cells may grow at so slow a rate that the patient dies from other causes before metastases become apparent.

Carcinoma-Circulating cells and prognosis

Information on this subject is of necessity incomplete as the systematic examination of blood for malignant cells has been in existence for too short a time for the long term prognosis to be assessed. Although, from the information available, it seems likely that the presence of circulating malignant cells carries a worse prognosis that their absence, it is apparent that the detection of cancer cells in the blood does not signify the establishment of bloodborne metastases in the near future. Thus Engell28 found that 51% of patients in whom circulating cancer cells were present at the time of operation were alive five to nine years later. Recent figures from Roberts and his colleagues on patients with operable carcinomata revealed that four times as many cases in whom no circulating cells were found were alive five to six years later than in whom circulating cells were present.

Carcinoma-Degree of differentiation.

Since there is considerable evidence that venous invasion is far more frequent in poorly differentiated tumours than in well differentiated growths one might expect that the incidence of circulating cancer cells would rise as the

degree of differentiation lessens. Although Engell²⁸ produced evidence to show that circulating malignant cells occurred more frequently in poorly differentiated tumours, I have been unable to obtain comparable results. 158 cases of adenocarcinoma were divided into four grades, grade 1 comprising very well differentiated growths, and grade 4 undifferentiated tumours. Reference to fig. 7 will show that, although no circulating cancer cells were found in grade 1 cases, the level of cells was 11% in grade 2, 12% in grade 3, and 11% in grade 4. The reason for the absence of any rise in incidence of circulating cells is not readily apparent.

Carcinoma—Degree of spread.

Several investigators have demonstrated a significantly higher incidence of circulating cancer cells, both in peripheral and local venous blood, in 'incurable' patients in whom carcinoma had extended beyond the powers of radical surgery than in 'curable' patients. For example, Long and his colleagues²⁹ found circulating malignant cells in the peripheral blood of 25% of the 'curable' patients, but in 39% of 'incurable' patients. I have attempted to classify the cases of adenocarcinoma

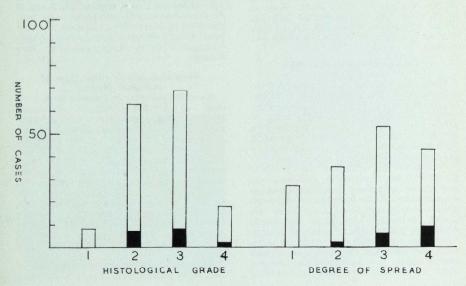
mentioned above into four degrees of spread, grade 1 comprising local growth, grade 2 infiltration of neighbouring structures, grade 3 lymph node involvement, and grade 4 the presence of bloodborne metastases. The results are depicted in Fig. 7. The incidence of circulating cancer cells rose from nil in grade 1, through 5.7% in grade 2 and 11.3% in grade 3, to 21% in grade 4. It appears very likely that the more advanced the disease the greater the chances of detecting circulating malignant cells.

> Carcinoma—Diagnostic procedures and circulating cells.

There is considerable evidence from animal experiments that diagnostic procedures may cause the liberation of malignant cells into the circulation. For instance, Peyton³⁰ showed that the mere injection of local anaesthetic around tumours in mice resulted in a considerable increase in bloodborne metastases.

Liberation of malignant cells during diagnosis may follow either manual or instrumental procedures. Circulating malignant cells are frequently liberated following manipulation in the course of rectal and pelvic examinations. The mere cleaning of skin over a malignant tumour, if performed sufficiently vigorously,

Fig. 7. The relation of the incidence of circulating malignant cells in cases of carcinoma to the degree of differentiation and degree of spread of tumour.



can result in the detection of circulating cancer cells. The exhaustive work of Pressman and Simon³¹ in animals has demonstrated conclusively the existence of direct communications between lymph nodes and veins. They were able to show that light pressure on a lymph node readily extruded malignant cells into the circulation. This finding suggests that the palpation of malignant lymph nodes is fraught with great danger.

With regard to instrumental diagnostic procedures, circulating cancer cells tend to be liberated during injection of local anaesthetic and subsequent aspiration biopsy of a malignant tumour, biopsy of malignant bone tumours, trans-urethral resection of vesical or prostatic carcinomata, and dilatation and curettage of the uterus in malignant disease. Numerous examples are recorded in the book by Cole

and his colleagues32.

In twenty cases of disseminated malignant disease I examined samples of peripheral venous blood five minutes before and five minutes after sternal marrow aspiration biopsy. Circulating cancer cells were found in six cases after biopsy but in only one case before biopsy. Marrow infiltration by malignant cells was present in all cases with positive blood samples. These findings illustrate the danger of forcing cancer cells into the circulation during introduction of a marrow biopsy needle. However, as all cases were of disseminated malignant disease with marrow infiltration, matters could scarcely have been made worse than they were already.

Carcinoma—Circulating cells and operation.

Many authorities are in agreement that circulating cancer cells appear for the first time, or are present in greatly increased numbers, during operation. The circulating cells are rarely present for the whole of the operation but tend to occur in transient showers which are almost always related to manipulation of the tumour in the course of operation.

Roberts and his colleagues³³ have produced a detailed study of circulating malignant cells in nine hundred patients undergoing operation for carcinoma. In the largest group of patients malignant cells were found in the blood only during operation. Laparotomy and biopsy alone were performed in one group of patients. Circulating cancer cells disappeared for a few days after operation but then rose to their previous level. It was suggested that operative stress had increased the tendency of circulating

cells to adhere to vascular endothelium and that their disappearance from the blood in the post-operative period was a result of their passage to extravascular sites with the formation of metastases.

In twenty-five cases of carcinoma undergoing operation at this hospital, circulating cancer cells were present in 8% before operation, in 52% during operation, and in 16% post-operatively. Of particular interest was the fact that malignant cells were present in 6 of 10 instances in which blood was taken from the internal jugular vein during operation. This finding suggested that, at operation, cancer cells tend to be widely disseminated, as circulating cells must have traversed the lungs and brain, and in some cases the liver, before reaching the internal jugular vein.

Carcinoma—Circulating cells and treatment.

There is little information upon this subject, but a few reports indicate that circulating cancer cells may decrease in number or actually disappear after chemotherapy, including the use of thio-TEPA and nitrogen mustard, or after deep X-ray therapy. The cells usually reappear when metastases develop. The use of corticosteroids appears to have no effect upon the numbers of circulating malignant cells.

In fifteen cases of generalised carcinoma of the breast cancer cells were found in the peripheral blood of six. No circulating cells were found in serial samples taken during or after treatment with cyclophosphamide or deep

Circulating cells in other types of malignant disease.

Malignant cells may be found in blood from cases of sarcoma, malignant melanoma, lymphosarcoma, reticulum cell sarcoma, myelomatosis and Hodgkin's disease.

The reports of circulating malignant cells in cases of sarcoma are infrequent, but all show a high incidence, averaging over 50%. I have examined peripheral blood from 30 patients suffering from sarcoma and have found malignant cells in 33%. Circulating sarcoma cells are large cells and resemble carcinoma cells but usually possess more cytoplasm. Occasionally the nucleus is elliptical and the cytoplasm arranged in a 'spindle' fashion. Clusters of cells are more frequent than in carcinoma (Fig. 8).

An incidence of circulating cancer cells of 70% in 36 patients with inoperable malignant

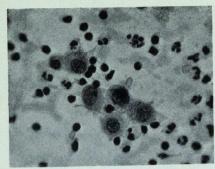


Fig. 8. Peripheral blood—osteogenic sarcoma.

Magnification × 500.

May-Grünwald-Giemsa.

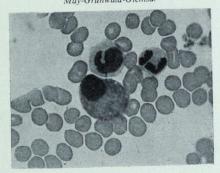
melanoma has been reported by Romsdahl and his colleagues³⁴. A direct relationship was noted between the rate of tumour growth or appearance of new metastatic nodules and the detection of circulating malignant cells.

A high incidence of circulating malignant cells is found in cases of lymphosarcoma and reticulum cell sarcoma. In my present series, cells were detected in peripheral blood in all of cight cases of lymphosarcoma and in four of five cases of reticulum cell sarcoma. The cells occurred individually on the whole but were present in considerably greater numbers than in cases of carcinoma. The majority resembled lymphoblasts although they were much larger (Fig. 9), but in some cases of reticulum cell sarcoma the cells were identical to primitive

Fig. II. Peripheral blood—myelomatosis. Youthful plasma cell.

Magnification × 1,500.

May-Grünwald-Giemsa.



reticulum cells. In contrast, malignant cells were found in the peripheral blood of only one of fifteen cases of Hodgkin's disease.

A somewhat different picture is found with myelomatosis. The great majority of cases posess myeloma cells in their peripheral blood (Fig. 10). However, in a few cases, only mature and youthful plasma cells (Fig. 11) are found. These occur in considerable numbers, and are

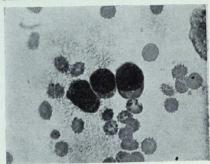
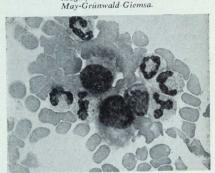


Fig. 9. Peripheral blood—lymphosarcoma. Magnification × 1,000. May-Grünwald-Giemsa.

Fig. 10. Peripheral blood—myelomatosis. Myeloma colls.

Magnification × 1,500.



rarely less than 100 in a 4ml. sample of blood. Since the maximum numbers of plasma cells in 4ml. samples from normal subjects or from patients suffering from other forms of malignant disease is 25, a false diagnosis of myelomatosis is unlikely to be made. Myeloma cells were found in ten of twelve cases of myelomatosis and numerous plasma cells in the other two. One must stress

that none of these patients suffered from the so-called 'plasma cell leukaemia' in which many plasma cells may be found in films of unconcentrated blood.

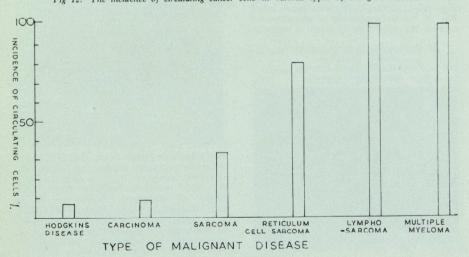
The incidence of circulating cancer cells in various types of malignant disease is depicted in Fig. 12. It seems probable that several factors are involved in this variation in incidence. Firstly, one must consider the varying tendency of tumours to metastasise via the bloodstream. Thus a sarcoma in which cells are in close relation to vascular channels might be expected to show a higher incidence of circulating malignant cells than a carcinoma where malignant cells are frequently separated from vascular channels by a fibrous tissue stroma. The ability of malignant cells to survive in the bloodstream is also probably of importance. It is self-evident that the longer a malignant cell is present in the blood, the greater are its chances of being detected in a random sample of blood. Carcinoma cells appear to be able to survive for only a relatively short period of time. It is possible that malignant cells more closely resembling cells normally found in the blood and bone marrow, such as myeloma cells and lymphosarcoma cells, are able to survive in the circulation for much longer periods of time. The degree of spread of the tumour must also be taken into account. In cases of carcinoma the incidence of circulating malignant cells rises considerably as the tumour becomes more extensive. The incidence of circulating cells would therefore be expected to be high in lymphosarcoma, reticulum cell sarcoma and myelomatosis. which are almost invariably cases of generalised disease.

The fate of circulating malignant cells

The establishment of bloodborne metastases is too large a subject to be discussed fully in this article. A summary of the most important relevant points will therefore be given.

There is some evidence, albeit scanty as yet, that circulating malignant cells are viable and capable of establishing metastases. Most of our information comes from animal experiments but circulating cancer cells from human subjects have been cultivated in tissue cultures and in one case of a malignant melanoma, a concentrate of peripheral blood injected near the umbilicus of the same patient resulted in metastatic tumours after a lapse of four and a half months³⁵. Large numbers of bloodborne cancer cells require to be introduced before metastases develop in experimental animals. Various authorities have found the injection of 10,000 to 750,000 cells to be necessary. In view of these high numbers it can be appreci-

Fig 12. The incidence of circulating cancer cells in various types of malignant disease.



ated that the presence of circulating malignant cells does not necessarily signify the establishment of metastases. The majority of bloodborne cells presumably perish whilst still in the circulation.

The actual progress of a circulating malignant cell to a metastasis is probably in two stages as described by Takahashi36. The first stage is adhesion of malignant cells to vascular endothelium. This may be aided by thrombus formation around the cells. The second stage is penetration of the endothelium by cancer cells. It is probably that this is a vital step in the establishment of metastases and that once a malignant cell has attained an extravascular position no regression can take place.

J. D. Griffiths and myself37 have been able to demonstrate the sequence of events following intravenous injection of Walker 256 tumour cells into rats. Initially the malignant cells adhere to pulmonary vascular endothelium and none are found in the blood. Extravascular passage of some cells occurs within five minutes. Forty-five minutes after injection cells appear in the blood as the initial endothelial adhesion is lost. Their numbers gradually dwindle as further extravascular migration takes place and endothelial adhesion occurs in other organs. The extravascular cells begin to divide and have formed small secondary deposits five days after injection.

Animal experiments have demonstrated that tumour 'takes' are increased following operative stress, anaesthesia and hypothermia. At these times it is probable that there is a greatly increased endothelial adhesion of circulating malignant cells. Since circulating cancer cells are most likely to be liberated during operative manipulation the possible hazards must be appreciated.

Conclusion

There is now abundant evidence that malignant cells can be recovered from circulating blood, and can be identified. Much industry and thought has been put into the development of methods for isolating bloodborne cancer cells. However, unless more efficient methods are developed, it appears that the routine examination of blood for cancer cells is unwarranted, except in certain selected cases. This is a result of the low incidence of many malignant cells, their sporadic appearance in the blood, and the considerable time that must be spent on scanning blood concentrates thoroughly. The examination of blood for malignant cells is of the greatest value in increasing our knowledge of the mode of spread of tumours and in revealing the dangers of liberating bloodborne cells by certain procedures. There is abundant evidence of the hazards of biopsy, curettage and manipulation of malignant tumours. The dangers of palpating carcinomata, or of cleansing skin overlying them vigorously, has also been made apparent. In view of the possibility of cancer cells being extruded into neighbouring veins malignant lymph nodes should be handled with due care.

It seems likely that more refined techniques for examining circulating malignant cells will become available in the future and will lead to considerable advances in the control of the spread of cancer.

Acknowledgements.

I would like to thank Mr. C. Naunton Morgan, Mr. J. D. Griffiths and Mr. A. McKinna for their help in obtaining samples of blood. Miss D. Cross and Mr. P. Crocker were of great assistance in the photography of cells. The majority of work referred to in this article has been submitted as a Thesis for an M.D. Cantab.

SELECTED REFERENCES

- 1. CRUVEII HIER. (1829). Anatomie pathologique du corps humain. Paris: Bailliére.
- 2. LOMER, E. (1883). Zur Fräge der Heilbarkeit des Carcinoms. Z. Geburtsh. Gynäk. 9, 277. 3. RECKLINGHAUSEN, F. VON. (1885). Ueber
- die venöse Embolie und die retrograden Transport in den Venen und in den Lymphgefässen. Virchows Arch. 100, 503. FINKEL, G. C. & TISHKOFF, G. H. (1960).
- Malignant cells in a peripheral blood smear, report of a case. New Engl. J. Med. 262, 187.
- 5. LOEPER & LOESTE. (1940). Cited by EWING, J. Neoplastic diseases, 4th ed. Philadelphia: W. B. Saunders.
- CHRISTENSON, W. N., ULTMANN, J. E. & MOHOS, S. C. (1956). Disseminated neuroblastoma in adult presenting picture of thrombocy-topenic purpura. Blood, 11, 273.
 OKINAKA, S., NAKAO, K., KINUGASA, K., TAKAKU, F. & OHTSUKI, K. (1956). Acta
- 8. MITUS, W. J., MEDNICOFF, I. B., WITTELS, B. & DAMESHEK, W. (1961). Neoplastic lymphoid reticulum cells in the peripheral blood: a histochemical study. Blood, 17, 206.

 9. POOL, E. H. & DUNLOP, G. R. (1934). Cancer
- cells in blood stream. Amer. J. Cancer, 21, 99. 10. PAPANICOLAOU, G. N. (1954). Atlas of exfoliative cytology. Cambridge, Mass.: Harvard
- University Press.

 11. PAPANICOLAOU, G. N. & TRAUT, H. (1943). Diagnosis of uterine cancer by vaginal smear. New York: The Commonwealth Fund.
- 12. COLE, W. H., PACKARD, D. & SOUTH-WICK, H. W. (1954). Carcinoma of the colon with special reference to prevention of recurrence. J. Amer. med. Ass. 155, 1549.

13. ENGELL, H. C. (1955). Cancer cells in the circulating blood. Acta chir. scand., Suppl.,

14. FERREBEE, J. W. & GEIMAN, Q. M. (1946). Studies on malarial parasites; procedure for preparing concentrates of Plasmodium vivax. I. infect. Dis. 78, 173.

15. GRAY, S. J. & MITCHELL, E. B. (1942). Effect of purified protein fractions on sedimentation rate of erythrocytes. Proc. Soc. exp. Biol., N.Y.

16. ALEXANDER, R. F. & SPRIGGS, A. I. (1960). The differential diagnosis of tumour cells in circulating blood. J. clin. Path. 13, 414.

17. MALMGREN, R. A., PRUITT, J. C., DEL VECCHIO, P. R. & POTTER, J. F. (1958). Method for cytologic detection of tumor cells in whole blood. J. nat. Cancer Inst. 20, 1203.

18. KUPER, S. W. A., BIGNALL, J. R. & LUCKCOCK, E. D. (1961). A quantitative method for studying tumour cells in blood. Lancet 1, 852.

19. KUPER, S. W. A. (1963). Ex-foliative cytology in the diagnosis of cancer of the bronchus. clin. Path. 16, 399.

20. SANDBERG, A. A. & MOORE, G. E. (1957). Examination of blood for tumor cells. J. nat. Cancer Inst. 19, 1.

21. SANDBERG, A. A., MOORE, G. E. & SCHUBARG, J. R. (1959). 'Atypical' cells in the blood of cancer patients-differentation from tumor cells. J. nat. Cancer Inst. 22, 555.

22. HERBEUVAL, R. HERBEUVAL, H. & DUHEILLE, J. (1963). Eléments nouveaux de diagnostic cytologique en leucocentration. Disseminatio vascularis cancrorum-Symposium, 27 Tune 1963

23. CANDAR, Z., RITCHIE, A. C., HOPKIRK, J. F. & LONG, R. C. (1962). The prognostic value of circulating tumor cells in patients with breast cancer. Surg. Gynec. Obstet. 115, 291.

24. FLEMING, J. A. (1963). Tumour cells in the blood in carcinoma of the breast. Proc. roy. Soc. Med. 56, 497.

25. POTTER, J. F. & MALMGREN, R. A. (1959). A new technique for the detection of tumor cells in the blood stream and its application to the study of the dissemination of cancer. Surg. Forum. 9, 580.

26. FLETCHER, W. S. & STEWART, J. W. (1959). Tumour cells in the blood with special reference to pre- and post-hepatic blood. Brit. J. Cancer,

27. POTTER, J. F., LONGENBAUGH, G., CHU, E., DILLON, J., ROMSDAHL, M. & MALMGREN, R. A. (1960). The relationship of tumor type and rescetability to the incidence of cancer cells in blood. Surg. Gynec. Obstet.

28. ENGELL, H. C. (1959). Cancer cells in the blood; a five to nine year follow-up study. Ann. Surg. 149 457

LONG, L., JONASSON, O., ROBERTS, S. McGRATH, R., McGREW, E. & COLE, W. H. (1960). Cancer cells in the blood, results of a simplified isolation technique. Arch. Surg., Chicago, 80, 910.
PEYTON, W. T. (1940). Danger in the use of

local infiltration anesthesia in operations upon malignant tumors. Ann. Surg. 111, 453.

31. PRESSMAN, J. J. & SIMON, M. B. (1961). Experimental evidence of direct communications between lymph nodes and veins. Surg. Gynec. Obstet. 113, 537.

COLE, W. H., McDONALD, G. O., ROBERTS, S. S. & SOUTHWICK, H. W. (1961). Dissemination of Cancer. New York: Appleton-Century-Crofts.

33. ROBERTS, S., JONASSON, O., LONG, L., McGREW, E. A., McGRATH, R. & COLE. W. H. (1962). Relationship of cancer cells in the circulating blood to operation. Cancer,

34. ROMSDAHL, M. M., POTTER J. F., MALM-GREN, R., CHU, E., BRINDLEY, C. & SMITH, R. (1960). A clinical study of circulating tumor cells in malignant melanoma. Surg. Gynec. Obstet. 111, 675.

35 McDONALD, G. O. & COLE, W. H. (1961). Tissue culture of cells recovered from the blood of patients with colonic and rectal cancer. Amer. J. Surg. 101, 11.

36. TAKAHASHI, M. (1915). An experimental study of metastasis. J. Path. Bact. 20, 1.

37. GRIFFITHS, J. D. & SALSBURY, A. J. (1963). The fate of circulating Walker 256 tumour cells injected intravenously in rats. Brit. J. Cancer,

RECENT PAPERS BY BART'S MEN

Abrahams, Sir Adolphe. A re-educative regimen for chronic (functional) constipation. Brit. J. clin. Pract., 18, Jan., 1964, pp. 1-5. *Adrian, Lord. Newton's rooms in Trinity. Notes roy.

Soc. Lond., 18, 1963, pp. 17-24.

Aumonier, F. J., see Cave, A. J. E., and *Bach, F. Arthritis, ability and disability, return to work. Rehabilitation, April/June, 1963, pp. 2-7. *Badenoch, A. W. Some points in the management of uric acid stones. J. Urol., 90, Dec., 1963, pp. 665-

Borrie, P. The treatment of xanthomatosis with atromid. Brit. J. Derm., 76, Feb., 1964, pp. 53-55. Braimbridge, M. V. Surgery of the descending thoracic aorta. Ann roy. Coll. Surg. Engl., 33, Dec., 1963, pp. 244-370.

-. A trial cannula for surgery of the aortic valve. Lancet. Feb. 1, 1964, p. 253.

*Brown J. R. (and Crowden, G. P.). Energy expenditure ranges and muscular work grades. Brit. J. Industr. Med., 20, 1963, pp. 277-283.

*Cairns, J. D. (and others). Traumatic rupture of the spleen with delayed intraperitoneal hæmorrhage during pregnancy. Canad. med. Ass. J., 90, Jan. 4, 1964, pp. 30-33. *Casson, F. R. C. Drugs and drink spell danger.

Family Doctor, March, 1964, pp. 162-163.
*Cave, A. J. E. Burchall's original specimens of

rhinoceros simus. Proc. Zool. Soc. Lond., 139, Dec., 1962, pp. 691-700.

. The pedal scent gland in rhinoceros. Proc. Zool. Soc. Lond.. 139. Dec., 1962, pp. 685-900.

— Vocal communication in the elephant. Wild Life, Uganda, 3, 1963, p. 15.

The white rhinoceros in Uganda. Oryx, 7,

April, 1963, pp. 26-29. , and Aumonier, F. J. Lymph node structure in diceros bicornis. J. roy. micr. Soc., 82, 1963, pp. 107-110

and Aumonier, F. I. The visceral histology of the Sumatran rhinoceros. J. roy. micr. Soc., 82 1963, pp. 29-37.

, and Steel, F. L. D. The diplee in adults of different age group. Med. Sci. Law, Jan., 1963,

Chamberlain, D. A., and Millard, F. J. C. The treatment of polycythæmia secondary to hypoxic lung disease by continuous oxygen administration. Quart. J. Med., 32, Oct., 1963, pp. 341-

*Charlton, C. A. C. Leiomyosarcoma of the external auditory canal. Brit. J. Surg., 51, Jan., 1964, pp. 24-25.

*Chrispin, A. R. (and Fry, I. K.). The presacral space shown by barium enema. Brit. J. Radiol.,

36, May, 1963, pp. 319-322.
*Cohen, E. Lipman. The treatment of acne vulgaris. Proc. XII Internat. Congr. Derm., Sept., 1962.

*Cole, P. V. Nitrous oxide and oxygen from a single cylinder. Anæsthesia, 19, Jan., 1964, pp. 3-11.
— (and Parkhouse, J.). Clinical experience with the E.M.O. inhaler. Postgrad. med. J., 39, 1963,

pp. 476-479. -, and Salt, K. H. An Oxford adapter for oral endotracheal tubes. Anæsthesia, 18, 1963, pp.

*Curwen, M. P. (with others). Controlled comparison of four sedative drugs in elderly patients. Brit. med. J., Oct. 26, 1963, pp. 1037-1040.

*Daly, M. de Burgh (and Hazzledine, Julie L.). The effects of artificially induced hyperventilation on the primary cardiac reflex response to stimulation of the carotid bodies in the dog. J. Physiol., 168, 1963, pp. 872-889

- (and others). Stimulation of the isolated perfused aortic bodies in the dog; reflex peripheral vascular responses. J. Physiol., 169, 1963, pp.

89P-90P.

De Mowbray, R. R. The hormones and puberty. Practitioner, 192, March, 1964, pp. 333-342. *Dobree, J. H. "Bird-beak" ophthalmic forceps.

Brit. J. Ophthal., 48, Jan., 1964, p. 53. *— Exudative diabetic retinopathy, spontaneous changes and effects of a corn oil diet. Brit. J.

Ophthal., 47, Nov., 1963, pp. 666-672.

*Du Heaume, B. H. Warts in general practice. J. Coll. gen. Pract., 7, 1964, pp. 87-93.

Dunkerley, D. R., see Shooter, R. A., and others. Earley. T. K., and Hunt, A. H. Hydatid disease of the liver. Brit. J. Surg., 51, Jan., 1964, pp. 50-52.

*Fiddian, R. V. Factors affecting flow through a stenosed vessel. Arch. Surg., 88, Jan., 1964, pp. 83-90.

- (with Edwards, E. A.). Blood vessel injury: features of the pathology. Postgrad. med. I., 39, Dec., 1963, pp. 724-728.

*Flavell, G. Chest diseases, edited by K. M. A Perry and Sir T. H. Sellors, 1963. Chapters 19,

Franklin, A. W. Special relationships in medicine.

Lancet, Jan. 11, 1964, pp. 57-61.

*Fuller, A. P. Epidermoid cyst of the maxilla caus-

ing "rhinitis coseosa" J. Laryng., 77, Dec., 1963, pp. 1038-1043.

*Gibb, W. E., and others. Survival in Whipple's disease. Brit. med. J., Feb. 15, 1964, p. 417. *Glenister, T. W. Fantasies, facts and fœtuses; the

interplay of fancy and reason in teratology. Med. Hist., 8, Jan., 1964, pp. 15-30.

Observations on mamalian blastocysts implanting in organ culture. In, Delayed implantation, edited by Allen C. Enders, pp. 171-182.

Griffiths, J. D., and Salsbury, A. J. The fate of circulating Walker 256 tumour cells injected intravenously in rats. Brit. J. Cancer, 17, Sept., 1963, pp. 546-57.

Gunz, F. W. (and Atkinson, H. R.). Medical radi ations and leukemia: a retrospective survey. Brit. med. J., Feb. 15, 1964, pp. 389-393.

Hamilton, W. J. (with Boyd, J. D.). Stromal trophoblastic buds. J. Obstet. Gynæc. Brit. Comm., 71, Feb., 1964, pp. 1-10.

*Hankey, G. T. Dental disorders. In, The Encyclopædia of General Practice, edited by G. F. Abercrombie and R. M. S. McConaghey, 1963, pp. 107-137

- (and Seward, G. R.). Monocytic leukemia appearing as leukoerythroblastic anæmia. J. oral Surg., 21, Sep., 1963, pp. 440-443.

*Hayward, G. W. Chest diseases, edited by K. M. A.

Perry and Sir T. H. Sellors, 1963. Chapter 21. Hector, Winifred E. For and against programmed learning. Nurs. Times, Jan. 17, 1964, pp. 85-87.

—. On being sick. Nurs. Times, Jan. 24, 1964,

pp. 108-109. *Hibbard, B. W. (and Hibbard, Elizabeth D.). Aetiological factors in abruptio placentæ. Brit. med. J. Dec. 7, 1963, pp. 1430-1436.

Hood, C. A., see Rothwell-Jackson, R. L. and Hubble, D. V. The endocrine disorders of childhood. Practitioner, 192, March, 1964, pp. 321-332.

Precocious menstruation in a mongoloid child with hypothyroidism - hormonal overlap.

J. clin. Endoc. 23, Dec. 1963, pp. 1302-1305.

*Hunt, A. H. (and others). Relation between cirr-

hosis and trace metal content of liver. Brit. med. J., Dec., 1963, pp. 1498-1501.

—, see also Earley, T. K. and ——.

*Huntsman, R. G. Comprehensive biochemistry, edited by M. Florkin and E. H. Stotz, Vol. 7, 1963. Chapter 51.

Functions of the blood, edited by R. G. Macfarlane and A. H. T. Robb-Smith, 1961.

Chapter 2 *____, and Lehmann, H. Detection of abnormal and feetal hæmoglobin in blood stains. Med. Sci. Law, Jan., 1963, pp. 59-64.

and others. Liquid nitrogen storage of hæmoglobin variants. J. clin. Path., 17, Jan., 1964, pp. 99-100.

(with others). The first cystine stone? Brit.

med. J., Jan. 4, 1964, p. 53. Joakes, A. M. (with Walker, J. M.). Survival after hæmoptysis and nephritis Lancet, Dec. 7, 1963, pp. 1199-1201.

(and others). Acute renal failure due to bilateral renal artery emboli: case report. Brit. med. J., Feb. 1, 1964, pp. 286-287.

*Iones, A. Radiotherapy of gliomata. Proc. roy. Soc. Med., 56, 1963, pp. 673-680.

Jones, B. S. (with Wilkinson, M.). Electrophoratic studies of synovial fluid proteins. Ann. rheum. Dis., 23, Jan., 1964, pp. 22-29.

*Jones, F. Avery. Diarrhua of small bowel origin. Proc. roy. Soc. Med., 56, Dec., 1963, pp. 1067-

Length of stay in hospital. Lancet, Feb. 8, 1964, pp. 321-322.

Kazantzis, G. (with others). Pernicious anæmia, myxædema, and hypogammaglobulinæmia-a family study. Brit. med. J., March 7, 1964, pp. 598-602.

Kinmonth, J. B., and Taylor, G. W. Chylous reflux. Brit. med. J., Feb., 29, 1964, pp. 529-532. *Kunkler, P. B. (with others). Radiation damage to

thoracic tissues. Thorax, 18, Dec., 1963, pp. 371-380.

*Lees, F., and Turner, J. W. Aldren. Natural history and prognosis of cervical spondylosis. *Brit. med. J.*, Dec. 28, 1963, pp. 1607-1610.

*Lehman, H. (with Griffiths, P. D.). Estimation of creatine phosphokinase as an additional method

for identification of seminal stains. Med. Sci.

Law, Jan., 1964, pp. 32-34.

— (with others). The first observation of an abnormal hæmoglobin in a Jewish family; hæmoglobin Bellinson. Brit. J. Hæmot., 9, 1963, pp. 484-486.

(with others). Incidence of pseudocholinesterase variants in Australian aborigines. Nature, 199, Sept. 14, 1963, p. 1115.

— (with others). Sickle-cell hæmoglobin K disease. Brit. med. J., Nov. 30, 1963, pp. 1381-1382.

, see also Huntsman, R. G., and others. Lofts, B. Evidence of an autonomous reproductive rhythm in an equatorial bird (Quelæ quelæ). Nature, 201, Feb. 1, 1964, pp. 523-524.

*McMenemey, W. H. Alzheimer's disease: problems concerning its concept and nature. Acta neurol,

scand., 39, Fasc., 4, 1963, pp. 369-380.

*Malpas, J. S. (with Callender, Sheila T.). Absorption of iron in cirrhosis of liver. Brit. med. J., Dec. 14, 1963, pp. 1516-1518.

see also Gibb. W. E., and others. *Martin, I. (and Compston, N.), Vincristine sulphate in the treatment of lymphoma and leukæmia. Lancet, Nov. 23, 1963, pp. 1080-1083.

Millard, F. J. C., see Chamberlain, D. A., and *Mourant, A. E. Blood groups in south-west Asia. In. The genetics of migrant and isolate poputions, edited by E. Goldschmidt, 1963, pp. 27-31. Evolution, genetics and anthropology. In

Smitthsonian Report, 1961, pp. 501-520.

L'hématologie, base de l'anthropologie moderne. Transfusion, 5, 1962, pp. 213-218. Notes on blood groups in India. In Indian anthoropology, edited by T. N. Madan and

Gopala Sarana, 1962, Chapter 8. The use in anthoropology of blood groups and other genetical characters. I. Afr. Hist., 111, 1962, pp. 291-296.

- (with others). A blood group 8 gene with variable expression. Vox Sung., 7, 1962, pp 579-

- (with others). The blood groups and hæmoglobin of the Malayalis. In. Indian anthropology, edited by T. N. Madan and Gopala Sarana. 1962, chapter 10.

(with others). The blood groups and hæmoglobins of the Veddahs of Ceylon. J. roy. Anthrop. Inst., 93, 1963, pp., 117-125.

- (with others). Distribution of sickle-cell hæmoglobin in Saudi Arabia. Nature, 198, May 4, 1963, pp. 492-493 (with others). A Lewis-negative "Bombay"

blood. Vox Sang., 8, 1963, pp. 269-272.

Murley, R. S. The planning of operating theatres.

Proc. roy. Soc. Med., 56, 1963, pp. 738-741. — (with Girling, J. A.). Parathyroid insufficiency after thyroidectomy. Nurs. Mirror, Feb. 28,

1964, pp. i-ii. Oakley, A. H. Shortage of trained medical laboratory technicians. Lancet, Feb. 29, 1964, pp.

487-488. O'Grady, F. Erythema component of the tuberculin reaction. Postgrad. med. J., 40, Feb., 1964, pp.

*Oswald, N. C. Acute tuberculosis and granulocytic disorders. Brit. med. I., Dec. 14, pp. 1489, 1496.

—. X-rays and the G.P. Med. World, 100, Feb..

1964, pp. 121-124. Painter, N. S. The atiology of diverticulosis of the colon with special reference to the action of certain drugs on the behaviour of the colon. Ann. roy. Coll. Surg. Engl. 34, Feb. 1964, pp.

*___ (and Truelove, S. C.). The effect of morphine in diverticulosis of the colon. World Congress Gastroenterology. IInd, 1962, II, 1963, pp. 852*Parrish, J. A. (and Bolt, R. J.). Effect of raw wheat germ on nutrition of the chicken. Nature, 199, 1963, pp. 398-399. see also Gibb, W. F., and others.

Perkins, E. S. (and Wood, R. M.). Auto-immunity in uveitis, Brit. J. Ophthal., 48, Feb., 1964, pp.

*Potter, J. M. Nursing observation of patients with head injuries. Nurs. Times, Oct. 19, 1962. *Rees. Linford. An ætiological study of menstrual asthma. J. psychosom. Res., 7, 1963,

pp. 191-197. An appraisal of the concept of cardiac neurosis. Acta Psychoter., 11, 1963, pp. 242-

Reiss, B. B. (with others). Parainfluenza infections in the community. Brit. med. J., Feb. 29, 1964, pp. 537-540

*Robinson, J. O. (and Brown, M.). Bladder. In, Encyclopædia of General Practice, edited by G. F. Abercrombie and R. M. S. McConaghey, 1963, pp. 246-262.

Rothwell-Jackson, R. L., and Hood, C. A. Ischæmia associated with Paget's disease. Nurs. Mirror, Pan. 10, 1964, pp. xi-xiii.

*Roxburgh, R A Ectopic ureterocele. Proc. roy. Soc. Med., 56, 1963, pp. 613-615. Salisbury, A. J., see Griffiths, J. D., and

Salt, R. H., see Cole, P. V. and Shooter, R. A., and others. Isolation of patients hospital. Brit. med. J., Oct. 12, 1963, p.

*--- and others. Pre-operative segregation of patients in a surgical ward. Brit med 1, Dec. 21, 1963, pp. 1567 1569.

(with others). Some aspects of nasal carriage of staphylococci. J. clin. Path., 17, 1964, pp. - (with others). Wrapping of sterilised articles.

Lancet, Sept. 14, 1963, pp. 582-583. Siegler, J. Recurrent pyogenic meningitis due to an osteoma of the frontal sinus. J. Laryng., 78,

1964, pp. 226-228. Smith, Barbara. Cerebral pathology in subarachnoid haemorrhage. J. Neurol. Neurosurg. Psychiat., 26, 1963, p. 535.

Spence, A. W. Hormonal disturbances in the elderly. *Stallard, H. B. Partial cyclectomy, some further modifications in technique. Brit. J. Ophthal.

48, Jan., 1964, pp. 1-6. Steel, F. L. D., see Cave, A. J. E., and -Sukumaran, P. K. (with others). Sickle-cell haemoglobin K disease. Brit. med. J., Nov. 30, 1963, pp. 1,381-1,382.

, see also Huntsman, R. G., and others. Taylor, G. W., see Kinmonth, J. B., and -

Thom, B. T., see Shooter, R. A., and others. Thorne, N. (with Fox, D.). Trial of S-carboxymethyl cystein ('Thiodril') ointment in the treatment of leg ulcers Brit. I. clin. Pract., 13, Feb., 1964, pp 75-79.

-. The skin clinic. Brit. J. clin. Pract., 17, Dec., 1963, pp. 747-749.

*Thorne Thorne, B. A test lens rack holder. Brit. J. Ophthal., 48, Jan., 1964, p. 57. *Todd, I. P. Juvenile polyps. Proc. roy. Soc. Med.,

56, Nov., 1963, pp. 969-970.

Trapnell, D. H. Recognition and incidence of intrapulmonary lymph nodes. Thorax, 19, Jan., 1964, pp. 44-50.

Turner, J. W. Aldren. Parkinsonism, aetiology and treatment. London Clin. med. J., 5, Jan., 1964, pp. 41-49.

see also Lees. F., and -*Turner, P. Candida endocarditis after cardiac surgery. Brit. med. J., Oct. 26, 1963, pp. 1,04-

1.042. *--- (and Sowry, G. S. C.). Triamterene in the treatment of ascites in hepatic cirrhosis. Brit. J.

clin. Pract., 18, Jan. 1964, pp. 13-17. *Waterworth, Pamela M. Apparent synergy between penicillin and erythromycin or fusidic acid. Clin. Med., 70, 1963.

The techniques used in assaying antibiotics in the clinical laboratory. J. med. Lab. Tech., 20, 1963, pp. 44-47.

*- (with Barber, Mary). Antibiotic sensitivity of proteus species. J. clin. Path., 17, Jan., 1964, pp. 69-74

Weale, F. E. Ice-colled melphalan for regional infusion. Lancet, Jan. 4, 1964, pp. 23-24. Weddell, G. Leprosy. Nurs. Times, Feb. 28, 1964.

pp. 272-274. *Weston, P. A. M. LGV in relation to urethral stricture. In, Lymphogranuloma venereum, 1962, pp. 153-168.

(and Harland, W. A.). Biliobronchial fistula following right hepatic lobectomy for metostatic leiomyosarcoma of the stomach. Brit. J. Surg.,

50, Nov., 1962, pp. 331-333. *—— (and Smith, B. J.). Metastatic melanoma in the bladder and urethra. Brit. J. Surg., 51, Jan., 1964, pp. 78-79.

*Wood, C. B. S. Acquired hypogammaglobinaemia complicated by reticulosarcoma Proc. roy. Soc. Med., 56, Dec., 1963, pp. 1,103-1,105.

*Reprints received and herewith gratefully acknowledged. Please address this material to the Librarian.

ST. BARTHOLOMEW'S HOSPITAL JOURNAL

CLINICAL AND RESEARCH SUPPLEMENT

CONTENTS

Retinoblastoma by H. B. Stallard ... i Injection Technique for filling the veins of the tower Limb Calf with Resin and description of cast produced by Patrick S. C. Bunning ... viii

Supplement No. 7

Vol. LXVIII, July, 1964

RETINOBLASTOMA

By H. B. Stallard

The tragedy of retinoblastoma is that this highly malignant neoplasm commonly affects both eyes of infants, and if unchecked will rapidly destroy sight and endanger life. It is also tragic that through the failure of doctors and nurses to realise the significance of a mother's observation: "his (or her) eye is like a cat's eye when light enters it," may so delay appropriate treatment that there remains no hope of saving the less affected eye.

This hospital has done the pioneer work in conserving the sight and saving the lives of infants so affected. Until 1929 (and regrettably in some countries today) both eyes were excised, however slightly the second eye was affected by retinoblastoma. Until 1929 attempts to destroy retinoblastoma by the crude apparatus then used for irradiation so damaged the whole eye that excision became inevitable. In 1929 Foster Moore, with whom I was privileged to work as Chief Assistant, was the first to achieve success in destroying retinoblastoma by radon seeds. The first patient, a boy, thus treated lived to 32 years of age and died of carcinoma of his bladder.

Clinical Features

Fortunately retinoblastoma is rare. Weller (Cancer Research, 1, 517, 1941) states that it occurs in 1 in 34,000 live births. All 118 infants referred to Barts have had both eyes affected. It is probably bilateral in about 40 per cent when the disease arises sporadically and in 100 per cent of the affected progeny of stock so tainted. Retinoblastoma is sometimes present at birth, the neoplasm completely filling one eye and affecting part of the retina in the other. In most, the neoplasm is evident during the first year of life, very rarely it appears between 11-13 years of age.

Retinoblastoma follows a dominant heredi-

tary character for it is common for 100 per cent of the families of one parent tainted by this disease to be so affected and it is known

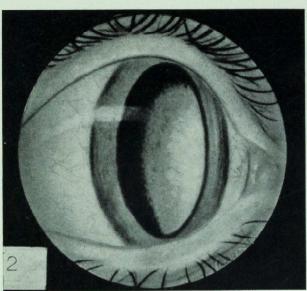


Fig. 1. 'Cat's eye reflex' of retinoblastoma.

to be transmitted through three generations. When it occurs sporadically, the parents being unaffected, the risk of a second child becoming a victim to this neoplasm is less than 4 per cent.

Generally when the "cat's cyc reflex" (Fig. 1) is noted more than half the retina is affected by the neoplasm and some or all of the remainder is detached.

If the other eye is affected the neoplasm is generally less extensive. Retinoblastoma is commonly hemispherical, white, flocculent and resembles cream cheese in appearance and consistency (Fig. 2). Loops of thin-walled blood vessels are evident. Sometimes up to six islands of retinoblastoma may be present (Fig. 3). The neoplasm grows rapidly.

Children have been sent to this hospital from 24 countries abroad from Brazil to Singapore West to East and from Poland to South Africa North to South.

Pathology

Retinoblastoma arises from "rests" of primitive retinal epithelium, its cells resemble those of the embryonic nuclear layer of the retina and are generally disposed in islands each around a central thinwalled blood vessel and those at the periphery of each island are undergoing degeneration as they become remote from their blood supply. (Fig. 4) Epithelial rosettes (Fig. 5) signify a partial differentiation and a slower rate of growth of the neoplastic cells. Flecks may break off from the neoplasm, become carried by the intra-ocular fluids and lodge between the ciliary processes

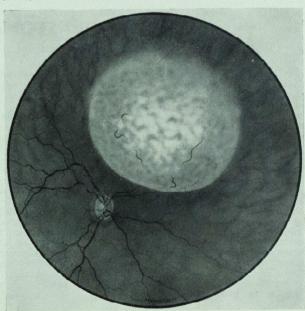


Fig. 2. Retinoblastoma.

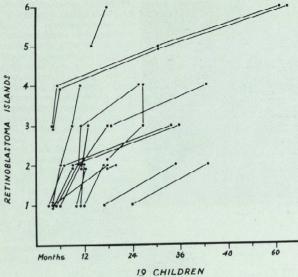


Fig. 3. Multiple islands of retinoblastoma.

and in the anterior crypts of the iris, and partly filling the anterior chamber, resemble a hypopyon. Complicated cataract may occur. Calcification occurs in degenerate areas. The neoplasm infiltrates the optic disc and the optic nerve may be involved in a curious manner, islands of growth being separated by apparently healthy nerve in the earlier stages. Once the retinoblastoma has reached the subarachnoid space the cells may be carried rapidly to the chaisma and floor of the skull. Retinoblastoma may penetrate the optic nerve sheaths, without invading the optic nerve. Toxin from large masses of degenerate neoplastic cells may excite an iridocyclitis. The increased intra-ocular volume caused by the growth

induces hydrothalmia (infantile glaucoma), the eyeball enlarges and the sclera becomes thin. Eventually the neoplasm bursts through the corneo-scleral junction and rapidly forms a large fungating mass which spreads over the face.

Metastases occur in the skull, long bones, spinal cord and also in the liver and regional lymph nodes. Death occurs from intra-cranial extension.

Very rarely spontaneous regression occurs. Such has coincided with a severe attack of scarlet fever.

Treatment

If the neoplasm has destroyed about half of the retina in one eye and the other eye is unaffected, excision with the full orbital length of the optic nerve is indicated. The optic nerve is divided at its entrance into the optic foramen. Serial sections of the nerve are cut, and if it has become infiltrated by the neoplasm the orbit is irradiated by "Co beam and chemo-

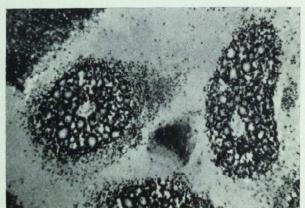


Fig. 4. Section through island of retinoblastoma. Central blood vessel zone of active tumour cells, peripheral degenerate cells and débris.

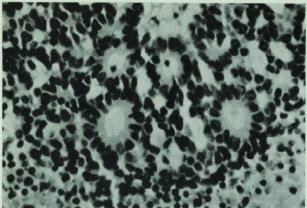


Fig. 5. Epithelial rosettes

therapy with cyclophosphamide is given.

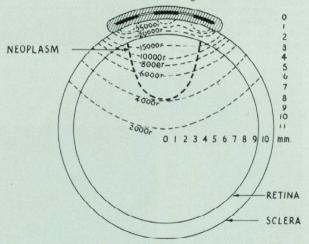
When one quarter or less of the retina is affected by retinoblastoma the prospect of destroying the neoplasm by irradiation and conserving some useful vision is good, just over 91 per cent are successful. The method of irradiation which seems to produce the best results to date is suturing a radio-active applicator to the sclera precisely over the base of the neoplasm; in the design of these much help was originally given by Mr. C. S. Stewart and later by Mr. G. Innes, physicists to the Radiotherapy Department of this Hospital. These applicators have been used since 1948, before which radon seeds were sutured to the sclera over the site of the neoplasm.

Radio-active 60 Co applicators

These applicators are (1) disks of 5, 7.5 and 15 mm active diameter (2) crescents of 13 x 6.5 mm and 13 x 9 mm (3) demi-disks of 5 x 2.5 mm and 7.5 x 3.75 mm. These conform with the average radius of curvature

(11 mm) of an infant's sclera, have a platinum casing 0.5 mm and a central well 0.3 mm deep into which is placed radio-active °°Co in the form of rings for the small applicators and a disk and rings in the larger. The arrangement of the °°Co is to produce even isodose curves through what is commonly a hemispherical tumour arising from a concave surface (Fig. 6).

The loading of each applicator is such that a dose of 4000 r is delivered to the summit of the neoplasm in 7 days. On an average the height of the neoplasm was 7/10 diameter of its base. It was histologically evident on cutting serial sections of



ISODOSE FOR 10mm. DIAMETER

DISK APPLIED FOR 7 DAYS.

(1.46mC. Co60)

Fig. 6. Diagram of a 10 mm. active diameter 1.46 mC ⁶⁰Co disk sutured to the sclera to show isodose curves.

irradiated eyes containing retinoblastoma that a dose of 3,500 r was lethal to the tumour cells.

Retinoblastoma is placed fourth in the order of tumour radiosensitivity, and moreover it is the only exception to Ellinger's law which states that the radiosensitivity of a neoplasm is relative to the radiosensitivity of the tissue from which it arises. The retina like the brain, from which it is an outgrowth, is radio-insensitive.

Technique of application

The sclera over the site of the neoplasm is exposed by reflecting a flap of conjunctiva and Tenon's capsule, and if necessary, dividing an extra-ocular muscle between mattress sutures. The periphery of the neoplasm is

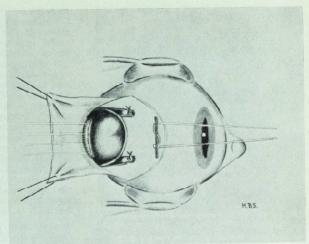


Fig. 7. 60Co applicator sutured to the sclera over the marked site of retinoblastoma.

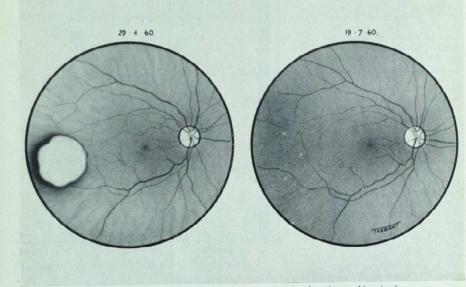


Fig. 8. The site of the irradiated retinoblastoma is marked by the minute white circular scars of catholysis enclosing a pigment-stippled area.

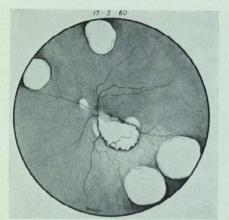


Fig. 9. Irradiated retinoblastoma, 8 mm in diameter, dense white débris.

marked by three or four catholysis punctures through the sclera, the string of hydrogen bubbles being seen by the opthalmoscope. The diameter of the tumour base is measured by callipers. An applicator is chosen in which radio-active element will overlap the periphery of the neo-

plasm by at least 1 mm.

The applicator is then placed in position, and through the hole in each lug the sclera is tattooed with a mapping pen dipped in gentian violet. At these two marked sites sutures are passed through the superficial layers of the sclera, then through the holes in the lugs and tied (Fig. 7). The transparent media of the eye allow a perfect opthalmoscopic view of the regression of the neoplasm to a flat pigmentstippled scar when the neoplasm is 5 mm in diameter or less (Fig.8), and when it is 6-10 mm in diameter there remains some inert dense white debris with sharp discrete edges (Fig. 9).

RESULTS

Statistics are mainly of value when a trend is shown. Success in saving the eye with some useful vision is a little over 91 per cent when one or two islands of retinoblastoma 10 mm or less in diameter, that is about \(\frac{1}{4} \) of the retina, is affected. Good results are much less, just over 65 per cent, when over $\frac{1}{4}$ and under $\frac{1}{3}$ of the retina is affected; and in just over 11 per cent when more than 1 of the retina has been involved in the growth, some guiding vision may be conserved (see table A). Table B. shows the visual results of 63 children in whom a 1 or less of the retina was destroyed by the neoplasm. It is remarkable that a one-eved child with the macula destroyed was able to train the nasal part of his retina to read J.4., with out optical aid, to write well and draw accurately, to attend an ordinary school and eventually to become a secretary.

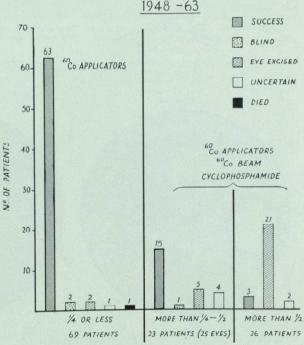


Table A. Comparison of results of treatment of 118 children according to the extent of retina involved in the neoplasm.

60 Co beam therapy and Chemotherapy

When a little less or more than ½ of the retina is involved in the neoplasm and when there are more than 3-6 islands of retinoblastoma and seedings are present in the vitreous, 60Co beam therapy is given with chemotherapy. Synergic therapy, chemotherapy and irradiation, is still labouring in the experimental stages and at present the choice of any of the several agents under trial rests on somewhat uncertain evidence of their relative values.

Thirty-two children in this series of 118 have recieved cyclophosphamide, the majority by mouth, a few by perfusion of the internal carotid artery. The eye is at a disadvantage in that perfusion of the opthalmic artery to the exclusion of the internal carotid and its important collateral vessels is surgically impracticable.

To date the less intense but more sustained effect of oral administration has been preferred. Probably in the future cyclophosphamide will be replaced by tritiated synkavit which increases the effective dose of irradiation by 40-60 per cent, or by some better and even less toxic alkylating agent.

Light Coagulation. Diathermy

For a small area of retinoblastoma, about 3 mm in diameter behind the equator light coagulation effectively destroys the neoplasm without serious intra-ocular damage if it is between the larger branches of the retinal vessels and not adjacent to either the macula or optic nerve; and diathermy is effective for a neoplasm of like size between the equator and the ora serrata. For larger neoplasms these forms of destruction by intense light and heat are often ineffective, may accelerate growth, induce endophthalmitis from the rapid breakdown of tumour cells, cause severe intraocular hemorrhage, and in the case of several applications of diathermy an infant's sclera may split.

Prevention

Sterilization abhorred by some religions and not publicly approved by most democratic politicians, is of course the only means at present of stopping the prepetuation of this binocular tragedy affecting sometimes 100 per cent of the progeny of tainted stock into the third and probably more generations.

The future

The future of radiotherapy depends on a better understanding of the interaction of ioni-

6/5 4 Illiterate. Probable Vision 6/6 - 6/12 ...11 6/6 21 5/60 or less 6/12 4 Macula involved 9 6/18 4 Vitreous haemorrhage. 1 6/24 1 Irradiation cataract. 1

Table B. Visual results, 63 children with \frac{1}{4} and less of the retina affected by retinoblastoma.

zing irradiation with living matter; on new methods of selective irradiation of tumour cells and on the discovery of means of increasing the radiosensitivity of these.

It is probable that the use of synergic therapeutic agents which either accelerate mitosis or render the dividing cell more vulnerable to irradiation and chemotherapy may considerably improve the results.

Ultimately the biochemists may wrest from nature facts about organo-chemical and biophysical changes which effect a spontaneous cure, it may be possible to induce specific cellular immunity to malignant cells.

To sum up it seems that there is a good chance of destroying by 60°Co applicators a retinoblastoma which is 10 mm or less in diameter. Diathermy applied to the surface of the sclera is effective for a neoplasm 3 mm or less in diameter situated at or anterior to the equator, and light coagulation for those of like size in the posterior part of the eye and between the larger retinal vessels. For the multiple islands of retinoblastoma scattered over the

fundus, for masses larger than 10 mm in diameter and when seeding into the vitreous has occurred the synergic therapy of *Cobalt beam irradiation with chemotherapy is indicated.

REFERENCES

Dodd, H. & Cockett, F. B. (1956). The pathology and surgery of the veins of the lower limb. Edinburgh & London: E. & S. Livingstone Ltd. Thompsett, D. H. (1956). Anatomical Techniques Edinburgh & London: E. & S. Livingstone Ltd. Foster Moore, R. (1933) Proc. Roy. Soc. Med. 26,

Foster Moore, R., Stallard, H. B. and Milner, I.G. (1931) Brit. Jl. Ophthal. 15, 673.

Stallard, H. B. (1933) 'Radiant Energy'. Brit. Jl. Ophthal. Monograph Supplement No. 6. (1933) Trans. Ophthal. Soc. U.K. 53, 224.

(1933) Trans. Ophthal. Soc. U.K. **53**, 224 (1936) Proc. Roy. Soc. Med. **29**, 963 (1936) Brit. Med. Jl. **2**, 962.

(1936) Brit. Med. Jl. 2, 962. (1938) Brit. Jl. Ophthal. 22, 604. (1948) Brit. Jl. Ophthal. 32, 618.

(1952) Brit. Jl. Ophthal. 36, 245 and 313.

(1955) Annals Roy. Coll. Surg. 16, 349. (1958) 'Eye Surgery' Ed. 3. Wright. Bristol. (1958) Acta XVIII Concil. Ophthal. 1, 518.

(1958) Acta XVIII Concil. Ophthal. 2, 1360. (1960) Trans. Ophthal. Soc. U.K. 80, 589. (1962) Trans. Ophthal. Soc. U.K. 82, 473.

INJECTION TECHNIQUE FOR FILLING THE VEINS OF THE LOWER LIMB CALF WITH RESIN AND DESCRIPTION OF THE CAST

PRODUCED

By Patrick S. C. Bunning

Department of Anatomy

Introduction

The technique was devised in order to fill with acrilic resin the superficial and deep veins of the calf.

The prime object of all the work was to produce a venous cast of this region in order to study the intramuscular soleal venous sinusoids and the channels perforating the deep fascia connecting the superficial to the deep veins

I would like to acknowledge the invaluable assistance I have obtained for this project from Dr. D. H. Thompsett's book on anatomical techniques.

Material and Method

The resin was injected into unembalmed adult lower limbs obtained from hospitals in

Ibadan, Nigeria. The resin was injected prior to the removal of the limb from the cadaver into both veins and arteries. The part was 70-95 degrees F by means of natural autolysis in order to preserve the venous valves holding together columns of resin on either side. These would be completely removed by acid maceration. The cast was cleaned with a jet of water and the soleal sinusoids painted yellow, the remaining deep veins pale blue and the superficial veins dark blue to clarify the relationship of the different cast components.

Two other embalmed lower limbs had coloured Neoprene latex injected into their veins and arteries using the same apparatus and method. These were then dissected to verify the nature of the cast components and their positions relative to the soft tissues.

Fig. 1.

The injection apparatus was assembled and mounted on a trolley built with Dexion frame. It consisted basically of a cylinder of compressed nitrogen which fed into a 5-gallon gas reservoir drum via reducing valve (See Figures 1, 2 and 3).

This relatively huge reservoir was connected by wide bore rubber tubing to a Y junction whose two arms were connected respectively to a manometer and resin containers. The resin containers consisted of inverted 1 pint blood transfusion bottles fitted with a metal screw cap in addition to a rubber bung.

Gas was fed to 4 resin containers at the same time to permit resin to be injected at more than one point simultaneously and also allow easy replacement of small quantities of resin with freshly added hardening accelerator agent. It was therefore possible to inject blue blood resin at different points and red coloured resin into arteries simultaneously if so required.

The limb being injected requires to be supported under the heel and sacrum to avoid compression of subcutaneous veins at points of contact.

Washing out of the vascular system with water or saline was found by experiment to be unnecessary using this technique and in fact when tried appeared to prevent the filling of some of the smaller vessels.

It was found that 300 mm Hg. pressure was the most successful for both arterial and venous injections of resin.

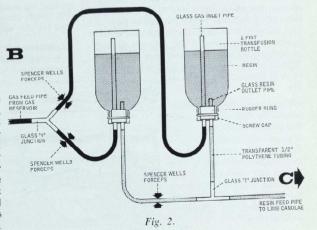
The relatively high injection pressure easily pushed out the postmortem contents of the

venous system ahead of the resin and was in addition found necessary to fill the intramuscular venous sinusoids within the soleus muscle.

Further details of technique

The proportions by volume of the constituents used for the resin injected were:

Marcon resin 7HV 4
Marcon resin 9HV 1
Marcon resin Crystic 182 0.1
Monomer C 5



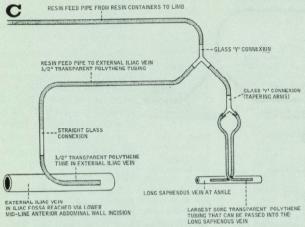


Fig. 3.

The 9HV resin used in this proportion was found to greatly decrease the viscosity of the injecting fluid and aided considerably the filling of the veins. The high proportion of crystic 182 resin used appeared to counteract the tendency of the large quantity of 9HV resin to make the cast brittle. The quantities of catalyst and accelerator used were adjusted in the tropical climatic conditions prevailing to give a setting time of 45 minutes. Approximately 4 pints of blue coloured resin were injected into the venous system and two pints of red into the arterial of each lower limb. The accelerator was added to each already mixed and catylized container of resin immediately before its

The resin being injected passed through ½ in. diameter transparent polythene tubing. It passed into the leg via polythene cannulæ inserted into the long saphenous vein at the ankle, and the external iliac vein and artery in the groin through a relatively avascular midline anterior abdominal wall incision.

usc.

Blue coloured resin was first injected into the long saphenous vein, a pressure cuff having previously been placed around the limb above the knee joint. This forced the resin from the superficial veins through the perforating communicating channels to the deep veins. When the resin had pushed the postmortem contents out of and had appeared in the open cannula in the external iliac vein the knee pressure cuff was removed and resin was injected down the now connected up cannula into the external iliac vein. This provided a more direct thrust of resin into the deep veins.

Finally 15 minutes later red coloured resin was injected into the external iliac artery. The pressure behind all resin venous and arterial throughout

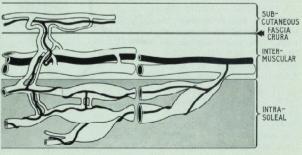
the experiment was 300 mm Hg. The pressure was maintained until the resin had set.

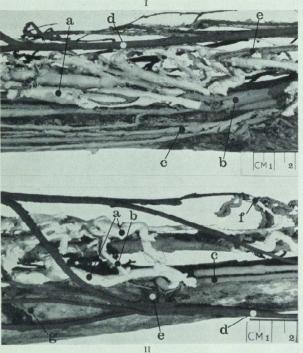
The limb was not touched for 24 hours after the experiment and was amputated after deep freezing to -5 degree C. The freezing protected the cast until it was placed into the macerating tank.

The maceration process took six months. The bones remained intact and attached to the cast at the end of this period.

Discussion

It was found possible to produce a largely complete cast of the venous system of the leg





Photograph 1. Lateral View of Proximal Half of Tibia and Cast.

- a = Soleal sinusoid with an artery around it.
- b = Peroneal artery and venae comites.
- c = Anterior tibial artery and venae comites.
- d = Short saphenous vein.
- e = Gastrocnemius veins.

Photograph II. Medial View of Intermediate Third of Tibia and Cast.

- a = Soleal sinusoids.
- b = Horizontal paired veins connecting the sinusoidal spaces.
- c = Paired segmental veins
- d = Long saphenous vein.
- e & g = Type A perforator.
- f = Type C perforator connecting the short saphenous vein to the soleal sinusoids.

calf using this method. The vessels were filled with resin down to capillary level. The cast gives a clear representation of the shape of the soleal intra-muscular venous sinusoids, the perforating veins and their connections. Undoubtedly the venous channels and spaces are somewhat distended because of the high pressure used although the latter was found necessary for filling the sinusoids. The simultaneous injection, however, of the material at an equal pressure avoided undue compression of the arteries by the veins or vice

The constant and equal thrust behind multiple source of resin being injected into the limb at as many points as required, appeared to make a difficult vascular injection relatively easy.

efficient.

Description of the Venous Cast

The pattern of the venous drainage of the lower limb has been described very thoroughly by many people in the past (Dodd and Cockett, 1956).

The use of several small containers for the

resin proved to be convenient, economical and

This communication only attempts to point out a few of the interesting features to be seen on examination of the resin cast in conjunction with the embalmed and Latex injected lower limbs.

The form of the intramuscular soleal venous sinusoids can be clearly seen as several parallel tubular spaces running vertically upwards along the length of the muscle and emptying into the venae comites of the posterior tibial and peroneal arteries just distal to the poplitcal fossa.

These sinusoids appear to be segmented from one end to the other by incomplete constrictions.

The sinusoidal spaces intercommunicate

principally at their distal ends.

Winding characteristically around the spaces in loose coils can be seen branches of either the posterior tibial or the peroneal arteries.

With the knowledge that the veins to which these spaces normally drain are valved, permitting a flow of blood in a headward direction only within the fascia crura, one gains a clear impression of a powerful venous peripheral pump. This is composed of several cylindrical tubes embedded in a powerful muscle and connected in parallel.

Certain other communications with the soleal sinusoidal system were observed. Several channels leave the sloping upper border of the soleus muscle and join the popliteal vein close to the point were the veins from the gastrocnemius muscle entered. One actually joined

a vein from gastrocnemius.

It was observed that veins draining the gastrocnemius muscle were paired, not single as sometimes described, and accompanied by the artery of supply to the belly concerned until just before they entered the popliteal vein when they united to form a single channel.

Several small unpaired veins connected the sinusoids to the comparatively minute venous system of the gastrocnemius muscle between

their respective bellies.

Numerous unpaired perforating channels from the subcutaneous venous plexus joined the collateral exposed surfaces of the soleal system i.e. where not covered by the gastro-cnemius muscle bellies.

The channels communicating with the sinusoids all tend to be paired and accompanied by an artery.

These include:-

- Those which join together to form the distal end of the sinusoidal spaces themselves.
- (ii) Those connecting the sinusoidal system collaterally to the paired veins accompanying the posterior tibial and peroncal arteries.
- (iii) Certain intersinusoidal connecting channels described later, and
- (iv) Those which perforate the deep fascia connecting the superficial to the deep veins.

The constancy of the paired nature of the perforating veins especially in the venous ulcer

gaiter area on the medical side of the leg is obviously important. This is particularly so since they do not always run close to each other superficial to the deep fascia and one of them could therefore be easily missed in an extra-fascial search.

An unpaired connection between the short saphenous vein and the distal end of the soleal sinusoidal system can be seen in the cast and Latex injected specimens $3\frac{1}{2}$ in. above the tip of the lateral malleolus. This connecting channel has to wind around the lateral aspect of the Tendo Achilles.

The predominant "segmental" drainage from the medial side of the soleus is well shown in the cast. The veins, paired as already stated, arise from the most anterior of two sinusoidal spaces on the medical side of the cast. The latter two sinusoids are united by a series of parallel paired horizontal channels each pair accompanying an artery.

The above mentioned segmental-like paired channels draining to the post tibial venae comites in the 'gaiter' area can be seen to be joined by the paired perforators before (and not at the same point as) they actually unite with the deep venae comites. They thus form a 'Y' junction.

A series of paired veins accompanying an artery are seen winding horizontally around the lateral aspect of the fibula. These pierce the anterior and posterior peroneal septae and interconnect the veins of the extensor, peroneal and flexor compartments. In the last named compartment they join the paired veins accompanying the peroneal artery.

These horizontal circumfibular channels are joined together by longitudinally running paired veins and arteries on both sides of the anterior peroneal septum.

In the distal quarter of the leg the circumfibular veins communicate with the perforating peroneal vessels and via them through the interosseous membrane with those in the flexor compartment.

This particular resin cast illustrates the fact that a large calibre long saphenous vein can occasionally give rise directly to the perforating veins on the medial aspect of the leg instead of one running posterior and parallel to it.

This is in contrast to limbs, (as seen on one of the Latex injected specimens) where the long saphenous vein is indistinguishable by size from neighbouring veins distal to the knee joint. It is interesting that in these specimens

despite numerous venous inter-connections that a straight course always exists along the normal course of the long saphenous vein through the venous maze along which a cannula or stripper will pass

Three fundamental types of perforating vein connecting superficial to deep systems can be discerned. The first, named Type A, is the most important, is seen on the cast in the 'gaiter' or venous ulcer bearing area of the leg, is a paired structure accompanying an artery and forms a 'Y' junction when uniting with a pair of veins draining segmentally the medical side of the soleal sinusoidal system.

One other pair of Type A is visible joining a circumfibular pair on the lateral side halfway up the leg. A pair of veins from the lateral side of the soleal system also drains to the

same circumfibular pair.

The second, named Type B, is seen at several sites on the cast, is only sometimes a paired structure and has no connection whatsoever with the soleal intramuscular sinusoids. It empties directly into deep veins. These Type B perforating veins can be seen:—

(i) As a paired structure accompanying an artery immediately posterior and inferior to the medial malleolus piercing the flexor retinaculum to reach the posterior tibial vessels.

(ii) As unpaired channels perforating the fascia crura along the medial border of the tibia above the 'gaiter' area draining to the posterior tibial venae comites. The highest of these shows

intimate connections with tibial periostial veins.

(iii) As paired veins accompanying an artery on both medial and lateral aspects of the leg just distal to the knee, which pierce the fibrous expansions to unite with the medial and lateral inferior genicular veins respectively.

The third, named Type C, are numerous and visible all over the cast, and are all unpaired structures and connect superficial veins to

intramuscular deep veins.

The largest of this Type C has already been mentioned earlier in the communication and joins the short saphenous vein to the soleal sinusoids.

Paired veins accompanying an artery run superficial to the fascia crura along the medial border of the tibia and these join and link together the medially placed perforating veins and arteries.

Acknowledgements

I would like to thank Professor Alastair G. Smith for making the material and apparatus available to me and for his assistance and advice throughout the project. I would also like to thank Mr. D. G. Stuart for his technical assistance. I am also very grateful to Mr. Peter Cull and Mr. David Tredinnick of the Medical Illustration Unit of St. Bartholomew's Hospital Medical College, for the drawings and photographs respectively.

RECENT PAPERS BY BART'S MEN

Alment, E. A. J. Intrauterine fœtal electrocardiography. Northampton Gen. Hosp., Clin Rep., 1964, pp. 25-31.

*Andrewes, Sir Cristopher H. Tumour-viruses and virus-tumours. Brit. med. J., March 14, pp. 653-

Apthorp, G. H. Sickle-cell anæmia. Proc. roy. Soc. Med., 57, March, 1964, p. 178.

-, and others. The effects of sympathectomy on the electrocardiogram and effort tolerance in angina pectoris. Brit. Heart J., 26, 1964, pp. 218-

Aumonier, F. J., see Cave, A. J. E., and -*Ball. H. C. J., (and others). Experiences with therapeutic nerve blocks. Anæsthesia, 19, April, 1964, pp. 250-264.

Ballantine, R. I. W., and Jackson, I. Anæsthesia for separation of craniopagus twins. Brit. med. J., May 23, 1964, pp. 1339-1340.

Beardwell, C. C. Acute hæmolytic anæmia with antipenicillin antibodies complicating subacute bacterial endocarditis. Proc. roy. Soc. Med., 57, April, 1964, pp. 332-333.

Black, K. O. Diabetes mellitus-its modern treatment and nursing care. Nurs. Mirror, May 22, 1964, pp. i-iii.

Boughton, Barbara, see Willoughby, D. A., and

*Boulton, T. B., and Cull, P. First aid in the illustration department. Med. biol. Illus., 14, April, 1964, pp. 113-120.

*Bradshaw, A. L., and Maysent, A. M. Physical aspects of electron therapy using the 15 MeV linear accelerator. Brit. J. Radiol., 37, March, 1964, pp. 219-224

Braimbridge, M. V., (with others). The value of histochemistry in the analysis of myocardial dysfunction. Lancet, May 2, 1964, pp. 963-965.

Brooke, B. N., (and Walker, F. C.). Circumcision without catgut. Brit. J. Urol., 36, March, 1964, pp. 106-109.

Brown, J. R. A chronology of major events in obstetrics and gynæcology. J. Obstet. Gynæc. Brit. Comm., 71, April, 1964, pp. 302-309. -. A new look at our smallpox vaccination

procedures. Consultant, Feb., 1964. Radiological health in industry. Dept. of Physiological Hygiene, University of Toronto,

Conference Paper, 1963. , (with Jarvis, Anita A.). Influence of age of radioactive fallout material upon its deposition

in milk and vertical distribution in soil.

J. Dairy Sci., 47, Jan., 1964, pp. 68-73. *Buckle, R. M. Mobilization of free fatty acids from adipose tissue from normal and diabetic

subjects. Diabetes, 12, ii, 1963, pp. 133-140. *---, and Nichol, W. D. Painful dysphagia due to monilial esophagitis. Brit. med. J., March 28, 1964, pp. 821-822.

Catchpole, B. N. Erythromelalgia. Lancet, April 25, 1964, pp. 909-911.

*Cave. A. J. E. The thymus gland in three genera of rhynoceros. Proc. zool. Soc. Lond., 142, Jan. 1964, pp. 73-83.

—, and Aumonier, F. J. Lymph node structure in an abiatic elephant. J. roy. micr. Soc., 82, 1963, pp. 251-255.

*Chamberlain, D. A., and Howard, Jane. The hæmodynamic effects of \(\beta \) -sympathetic blockade. Brit. Heart J., 26, 1964, pp. 213-217.

*---, (with Lewis, J. G.). Alcohol consumption and smoking habits in male patients with pulmonary tuberculosis. Brit. 1. prev. soc. Med., 17, July, 1963, pp. 149-152.

, see also Apthorp, G. H., and others. *Cotes, J. E. Terminology for exchange of gas in the lungs. Lancet, Oct. 19, 1963, p. 843. Cull, P. G., see Boulton, T. B., and ——.

Cunningham, G. J., (with others). The value of histochemistry in the analysis of myocardial dysfunction. Lancet, May 2, 1964, pp. 963-965.

*Davidson, J. K. Pulmonary changes in decompression sickness. Clin. Radiol., 15, April, 1964, pp. 106-111.

— Radiology in decompression sickness; the Clyde tunnel. Scot. med. J., Jan., pp. 1-9. Du Boulay, G. H. Radiological examination of two pairs of craniopagus twins. Brit. med. J.,

May 23, 1964, pp. 1337-1338. Dunkerley, D. R. Double gall bladder. Proc. roy. Soc. Med., 57, April, 1964, pp. 331-332.
*Edmonds-Seal, J. An overdose of lignocaine.

*Anæsthesia, 19, April, 1964, pp. 222-225.

*Finlayson, R. Vascular disease in captive animals. Symp. zool. Soc. Lond., Feb., 1964, pp. 99-106. Fowler, J. F. Differences in survival curve shapes for formal multi-target and multi-hit models.

Phys. Med. Biol., 9, April, 1964, pp. 177-188. Franklin, A. W. The child with congenital limb disorders. *Practitioner*, 192, April, 1964, pp. 485-

Pædiatric care of craniopagus twins. Brit. med. J., May 23, 1964, pp. 1342-1344. *Freier, S., (and others). Neonatal jaundice in

families with enzymatic defect of the red blood cell. Israel J. Zool., 12, Dec., 1963, p. 221. *Fuller, A. P., (with McAlpine, J. C.). Localized

laryngeal amyloidosis, a report of a case with a review of the literature I. Laryng., 78, March.

1964, pp. 296-314. Garrod, O. Sarcoidosis with dysphagia, peripheral neuropathy and multiple cranial nerve lesions. Proc. roy. Soc. Med., 57, March, 1964, p. 175.

*Gey, G. O., (and Kennard, D. W.). Work and power capacity of normal mice and those suffering from muscular dystrophy, measured during stationary swimming. Nature, 202, April 18, 1964, pp. 264-266.

*Gunz, F. W., (and Fitzgerald, P. H.). Chromosomes and leukemia. Blood, 23, March, 1964, pp. 394-

-, (with Angus, Helen B.). Chronic granulocytic leukemia and cancer. Blood, 22, 1963, pp. 88-91. (with Hilder, F. M.). The effect of age on normal values of the Westergren sedimentation rate. J. clin. Path., 17, May, 1964, pp. 292-293.

-, (with others). Chromosome studies in adult acute leukemia. J. Nat. Cancer Inst., 32, 1964, pp. 395-417

Hayward, G. W., see Apthorp, G. H., and others. Howard, Jane, see Chamberlain, D. A., and -Hubble, D. V. Blood diseases in the newly born. Nurs. Mirror, 118, April 17, 1964, pp. 51-52. Medicine and society. Lancet, May 9, 1964,

pp. 995-1000

*Knox, R. Penicillin in perspective: the old and the new. Research Reviews, 1962-63, pp. 46-50.
*Lefford, M. J., (with others). The virulence in the

Javes, P. H. Plastic repair after separation of

craniopagus twins. Brit. med. J., May 23, 1964,

Jackson, I., see Balantine, R. I. W., and

pp. 1340-1342.

guinea pig of tubercule bacilli from patients with pulmonary tuberculosis in Hong Kong. Tubercle, 44, 1963, pp. 446-451.

Lewis, O. J. The homologies of the mammalian tarsal bones. J. Anat., 98, 1964, pp. 195-208. —. The tibialis posterior tendon in the primate foot. J. Anat., 98, 1964, pp. 209-218.

*Lumb, G., (and Hardy, L. B.). Collateral circulation in the heart. N. C. med. J., 24, Oct., 1963. McColl, I., (and Hill, Marjorie J.). Operative use of ultrasonics in cholelithiasis. Nature, 202,

May 23, 1964, pp. 799-800. Marshall, R., (with others). A method for measuring instantaneous pulmonary capillary bloodflow and right ventricular stroke volume in man. Clin. Sci., 26, 1964, pp. 247-260.

Matthews, E. K., and Quilliam, J. P. Effects of central depressant drugs upon acetylcholine release. Brit. J. Pharmacol., 22, April, 1964, pp. 415-440.

Maysent, A. M., see Bradshaw, A. L., and -*Moody, D. P. Biogenetic hypotheses for aflatoxin. Nature, 202, April 11, 1964, p. 188.

*_____, (with Moody, D. E. M.). Toxic products in groundnuts. Nature, 198, 1963, pp. 294-295. *Murley, R. S. Parathyroid insufficiency following thyroidectomy. Boll. Soc. med-chir. Pisa, 21,

April, 1963, pp. 121-127. Nichol, W. D., see Buckle, R. M., and -

Nicol, C. S. The organization of the Venereal Diseases Services in any future major military campaign. Proc. roy. Soc. Med., 57, March.

1964, pp. 180-181.
 Nicolson, I. C. Trans-Sahara adventure. J. roy. Army med. Corps, 110, 1964, pp. 55-61.

O'Connell, J. E. A. Investigation and treatment of craniopagus twins. Brit. med. J., May 23,

-, Surgical separation of two pairs of craniopagus twins. Brit. med. J., May 23, 1964, pp. 1333-

*O'Grady, F. Erythema component of the tuberculin reaction. Postgrad. med. J., 40, 1964,

Oswald, N. C. X-rays and the G.P. Med. World, 100, March, 1964, pp. 198-201. Chest X-rays and the G.P. Med. World, 100, May, 1964, pp. 391-393.

Parrish, J. A., (with others). Adult coliac disease Ann. int. Med., 60, April, 1964, pp. 581-586. *Perkins, E. S. The antigenic relationships of ocular

and other tissues. Irans. ophthal. Soc. U.K., 83, 1963, pp. 271-278. *Pott, N., (with others). Cambridge East Greenland Expedition, 1963. General Report. 1963.

Ouilliam, J. P., see Matthews, E. K., and -*Robb-Smith, A. H. T., (with others). Mural thrombosis of the internal carotid artery and subsequent embolism. Quart. J. Med., 33, Jan., 1964, pp. 155-195.

*---, (with others). Mural thrombosis of the subclavian artery and subsequent embolism in cervical rib. Quart. J. Med., 33, Jan., 1964. pp. 133-154

Robins, R. H. C. It's only a cut finger. Postgrad.

med. J., 40, May, 1964, pp. 240-246.
Rothnie, N. G. Sutureless skin closure. Nurs. Mirror, 118, April, 10, 1964, pp. v-vii, xiii.

see also Wyatt, A. P., and Roxburgh, R. A. Acute on chronic jejuno gastric intussusception following partial gastrectomy. Postgrad. med. J., 40, April, 1964, pp. 212-213. Russell, B. F. Parasitic infestations of the skin.

Practitioner, 192, May, 1964, pp. 621-628. Scowen, E. F., (with others). Primary hyperoxa-

luria. Lancet, Nov. 23, 1963, pp. 1096-1097. -, see also Thould, A. K., and *Simon, G. The value of radiology in critical mitral

stenosis. Clin. Radiol., 15, April, 1964, pp.99-

*Smith, M. A., (and Wells, R. S.). Male-type alopecia, alopecia areata, and normal hair in

women. Arch. Derm.. 89, 1964, pp. 95-98. Spector, W. G., and Willoughby, D. A. The effect of vascular permeability factors on the emigration of leucocytes. J. Path. Bact., 87, April, 1964, pp. 341-346.

, see also Willoughby, D. A., and others. Stack, H. G. Tumours of the hand. Postgrad. med. J., 40, May, 1964, pp. 290-298.

Taylor, G. W., see Wyatt, A. P., and others. Thorne, N. The skin clinic Brit I clin. Pract.

18, March, 1964, pp 171-174. *Thould, A. K., and Scowen, E. F. Genetic studies

of the syndrome of congenital deafness and simple goitre. Ann. hum. Genet., 27, 1964, pp. 283-293.
Todd, I. Juvenile polyps. Arch. Dis. Childh., 39, April. 1964. pp. 166-167.
*Trapnell, D. H. Radiological appearances of

lymphangitis carcinomatosa of the lung. Thorax, 19, May, 1964, pp. 251 260. *Ward, H. W. C. Electron therapy at 15 MeV.

Brit. J. Radiol., 37, March, 1964, pp. 225-230. Weddell, G. Leprosy: some experimental observations. Research Reviews, 1962-63, pp. 101-107.

Weitzman, D. Post-mortem coronary arteriography and its correlation with electrocardiography Brit. Heart J., 26, May, 1964, pp. 330-336. *Whittard, B. R., (and Thomas, K. E.). A "new"

polyvinyl-chloride cuffed tracheostomy tube. Lancet, April 11, 1964, p. 797. Wickham, J. E. A. Aortic rupture presenting with hæmaturia and priapism. Brit. J. Urol., 36.

March, 1964, pp. 89-90. Willoughby, D. A., and others. A lymph-node permeability factor in the tuberculin reaction. J. Path. Bact., 87, April, 1964, pp. 353-363.

Wood, P. H. N., (with others). Indomethacin in rheumatic diseases. Ann. rheum. Dis., 23, May,

1964, pp. 218-225. Wyatt, A. P., and others. The vascularization of vein-grafts. Brit. J. Surg., 51, May, 1964,

*Reprints received and herewith gratefully acknowledged. Please address this material to the Librarian.

ST. BARTHOLOMEW'S HOSPITAL JOURNAL

CLINICAL AND RESEARCH SUPPLEMENT

CONTENTS

The Clinical Significance of Platelet	
Antibodies by Peter Story	i
New Specimens added to the Museum	vii
Two Specimens of Particular Interest by	
W. J. Hanbury	Xi
The Talo-Calcaneal Interosscous Liga-	
mentous Apparatus by P. S. C. Bunning	X
Recent Papers by Bart's Men	xiv

Supplement No. 8

Vol. LXVIII, October, 1964

THE CLINICAL SIGNIFICANCE OF PLATELET ANTIBODIES

By Peter Story

Introduction

Platelets were concerned in one of the earliest studies of auto-immune disease when Bedson (1922) made an anti-platelet serum by immunizing rabbits with guinea-pig platelets. Injection of this serum into guinea-pigs caused thrombocytopenia by destroying platelets and damaged capillary endothelium. During following years several workers tried to elucidate a relationship between the spleen and idiopathic thrombocytopenic purpura (ITP). In the last fifteen years many reports have appeared on the role of circulating platelet antibodies in thrombocytopenia.

This latest phase started with the observations by Evans and Douane (1949) of an occasional association of thrombocytopenia and leucopenia with acquired hæmolytic anæmia and their suggestion that, as acquired hæmolytic anæmia is due to a demonstrable antibody, the thrombo-

cytopenia and leucopenia might have a similar cause. Later they demonstrated platelet agglutinins in the blood of these patients (Evans and others, 1951). In addition they drew attention to a transitory thrombocytopenia which may occur in the infants of women with acquired hæmolytic anæmia and suggested that it might be due to a plasma anti-platelet factor crossing the placenta. Reports soon followed of platelet antibodies in other forms of thrombocytopenia including sedormid purpura (Ackroyd, 1949), idiopathic thrombocytopenic purрига (ITP) (Harrington and others, 1951), following blood transfusion (Sprague and others, 1952; Stefanini and others, 1952) and in neonatal purpura (Harrington and others, 1953). Since 1954 many more reports have been published but understanding of platelet antigens and antibodies has been retarded by technical difficulties.

Detection of Platelet Antibodies

The technical difficulties in this field derive mainly from the following causes. 1. Platelets have a natural tendency to aggregate and clump and, even though care is taken to prevent this happening, it may occur on manipulation of platelet suspensions and be confused with agglutination by antibody. 2. Platelet agglutinins usually cause only weak agglutination which is difficult to see. 3. In thrombocytopenia it may be impossible to obtain a satisfactory suspension of the patient's own platelets, unless thrombocytopenia remits, to test for auto-antibodies. However in these cases iso-antibodies may be detected using platelet suspensions from another individual. 4. Platelets may also contain red cell blood group (Gurevitch and Nelken, 1954) and leucocyte antigens (Pearson and others, 1964). 5. Methods not concerned with platelet agglutination are usually difficult and time con-

The variety of methods applied shows great ingenuity but suggests that many are unsatisfactory and difficult to reproduce. Techniques which have been used include the following: platelet agglutination, lysis and precipitation, direct and indirect Coombs test, antiglobulinconsumption test (Moulinier, 1955), mixed antiglobulin reactions (Chalmers and others, 1959), fluorescent antibodies to platelets and megakaryocytes (Corn and Upshaw, 1962; McKenna and Pisciotta, 1962), impairment of clot retraction (Upshaw, 1962) and tanned red cell agglutination (Kissmeyer-Nielsen, 1953). Upshaw (1962) and Borel and others (1963) have distinguished auto- and iso-antibodies by their power to suppress uptake of radioactive serotonin by platelets. Dausset and others (1961) claim that this is possible with the antiglobulinconsumption test. One of the most prolific workers in this field has been Shulman and he and his collaborators have used complement fixation tests (Shulman and others, 1962).

Platelet Antigens and Groups

The definition of platelet antigens and groups can be no better than that of the antibodies used to detect them which, as has already been emphasised, is far from satisfactory. Harrington and others (1953) on the basis of their studies with agglutinins thought that there were twelve platelet groups, but at about the same time and using similar methods Stefanini and others (1953) thought there were probably only four. Pearson and others (1964) in their work on families with neonatal thrombocytopenia

identified three well defined platelet antigens—the Pl^{A1} antigen system which was confined to platelets and existed in homozygous and heterozygous forms, and two other antigens, Pl Gr Ly^{B1} and Pl Gr Ly^{C1} which were shared with granular and lymphocytic leucocytes.

Borel and others (1963) have investigated rabbit and human platelet antigens. They found platelet antigens different from blood group and leucocyte antigens, and not so well defined as those of red cells. These authors think human platelet typing will be very difficult and may even be an impossible task.

Idiopathic Thrombocytopenic Purpura (ITP)

Evidence that this disease is auto-immune comes from clinical and laboratory observations implying the presence of platelet antibodies, and detection of antibody.

In the first category the main evidence has been reviewed recently by Jackson and others (1963). Infants born of mothers with ITP may have neonatal thrombocytopenia (Epstein and others, 1950). Transfusion of plasma from patients with ITP to normal recipients has produced transient thrombocytopenia (Harrington and others, 1951). Normal platelets often have a short survival time when administered to patients with ITP (Stefanini and others. 1952). Acquired hæmolytic anæmia with demonstrable auto-antibodies against red cells occasionally has been encountered in patients who also had thrombocytopenia (Evans and Douane, 1949). Adrenocortical hormones which block certain antibody responses are effective in the treatment of some patients with ITP and are reported to inhibit formation of antibodies against human platelets in rabbits (Suhrland and others, 1958). Splenectomy, a procedure that may be beneficial in ITP, renders rats less susceptible to the thrombocytopenic effects of heterologous anti-platelet serum (Harrington and others, 1953).

Attempts to identify platelet antibodies invitro have yielded conflicting results. On the one hand Harrington and others (1953) found platelet agglutinins in 21/31 cases. Stefanini and others (1953) in 22/78, and van de Wiel and others (1961) in 13/23. In contrast, Corn and Upshaw (1962) tried five in-vitro, and two in-vivo methods and failed to demonstrate platelet antibodies in their patients with ITP. Some other workers have failed to detect platelet antibodies in this condition too (Jackson and others, 1963), but a majority have found platelet antibodies of some kind.

Interpretation of the finding of platelet antibody is made more difficult by inability to distinguish auto- and iso-antibodies. Patients who have been pregnant or transfused may have platelet iso-agglutinins in their blood without thrombocytopenia, and so may a few normal people who have not been transfused or pregnant (Harrington, 1954). It seems likely that platelet antibodies may be able to produce thrombocytopenia at a level of antibody which is too low to be detected by in-vitro tests, and there is experimental evidence to support this view (Shulman and others, 1961).

An apparent paradox in ITP is the persistence of demonstrable platelet agglutinins after satisfactory remission of thrombocytopenia following splenectomy. Probably sensitized platelets survive longer in splenectomised patients, and this certainly happens in rats subjected to heterologous anti-rat platelet serum (Harrington and others, 1953).

It was hoped at one time that the finding of platelet antibodies would be of value in predicting the outcome of splenectomy but this has not proved to be so.

In conclusion, it may be said that a majority regard ITP as an auto-immune disorder mainly for the clinical and indirect evidence already mentioned, but by no means everyone would regard this hypothesis as proven. The possibility remains that ITP is a disorder of mixed causes, and not always auto-immune.

Thrombocytopenic Pupura Due To Drugs

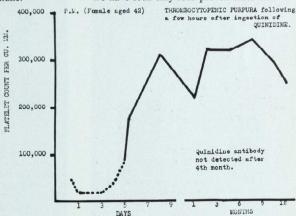
In 1949 Ackroyd published the first of his series of papers about the thrombocytopenic purpura which sometimes occurs in people taking the drug sedormid. He showed that blood taken from these hypersensitive individuals contained an antibody which, only in the presence of sedormid, agglutinated and lysed platelets and inhibited clot retraction. Lysis of platelets occurred if complement was present, otherwise only agglutination. Ackroyd thought that a probable explanation of this phenomenon was that sedormid united with platelets and, acting as a hapten, conferred auto-antigenic properties upon them. The antigen, platelets and drug, would be

formed whenever sedormid was taken. Vascular lesions might be independent of thrombocytopenia, or produced by anti-platelet factors as in Bedson's (1922) experiments already mentioned (Ackroyd, 1955).

More recently another explanation has been put forward by Shulman (1958) whose view is that an antigen-antibody reaction occurs in plasma apart from platelets, and involving them only as "innocent bystanders". Platelets enter into the reaction because they have surfaces permitting attachment of antigen-antibody molecules analogous to the non-specific absorption of various proteins. This attachment of antibody to platelets would make them more liable to removal from the circulation.

Steinkamp and others (1955) have shown that this type of hypersensitivity may be transferred passively. In their experiment plasma from a patient subject to quinine thrombocytopenia was injected intravenously into a normal volunteer, one of the authors, who was taking quinine by mouth. The recipient quickly developed a transient but very severe thrombocytopenic purpura. It seemes likely too that this factor can cross the placenta, as in the case of quinine thrombocytopenia in a mother and her infant described by Posner (1937).

The most commonly encountered druginduced thrombocytopenia of this kind is due to quinidine, and even this is fairly uncommon. We have seen only four proven cases here dur-



Ingestion of quinidine on 1st morning and previous afternoon.
Onset of purpure on 1st day.

Fig. 1.—Platelet levels in a 42-year-old woman who developed purpura suddenly after taking quinidine for some months.

ing the last ten years. Bolton and Dameshek (1956) have reviewed the literature and added some new cases. In this condition thrombocytopenic purpura develops with dramatic suddenness a few hours after taking quinidine by mouth. Usually a patient has been taking the drug for some time intermittently, and presumably during one of the intermissions antibody is produced. When quinidine is stopped the platelet count recovers in a few days (Fig. 1). but antibody is demonstrable for several months and further ingestion of the drug results in purpura again. A diagnosis may be confirmed by giving a small test dose of the suspected drug but this may be dangerous, and in-vitro tests to show platelet agglutination and inhibition of clot retraction in the presence of the drug (Figs. 2 and 3 from case shown in Fig. 1) are often satisfactory. These tests may be of considerable clinical value and the results are much more clear cut and easy to interpret than platelet agglutination in other conditions. The antibody is highly specific and there is no cross reaction even between quinidine and quinine.

In quinidine thrombocytopenia in-vitro tests are usually positive but this is not the case in

Fig. 2.—Blood from patient in Fig. 1 showing normal clot retraction (left), and inhibition of clot retraction by addition of a trace of quinidine (right).

all drug thrombocytopenias. It must be remembered too that there are other types of drug thrombocytopenia and purpura where an antibody mechanism is not demonstrable or even suspected.

Neonatal Thrombocytopenia

The neonatal thrombocytopenias in which platelet antibodies are concerned are usually transitory and the platelet count has generally become normal spontaneously within three weeks of birth. Despite the tendency to spontaneous recovery there is a mortality of about 12 per cent (Pearson and others, 1964). In most cases of this uncommon disorder thrombocytopenic purpura is present in the mother and it is assumed that platelet antibodies cross the placenta into the infant's circulation. Mothers with ITP may give birth to normal children or even dissimilarly affected twins (Epstein and others, 1950). Sometimes a non-thrombocytopenic mother, in remission from ITP following splenectomy, may give birth to an affected infant, presumably because the infant has a spleen to remove sensitized platelets (Harrington, 1954).

Transient neonatal thrombocytopenic purpura associated with platelet antibodies may also be found in the newborn of apparently normal mothers. It has been suggested that in this situation the mother develops iso-antibodies against her baby's platelets in a manner analogous to Rhesus iso-immunization in hæmolytic disease of the newborn (Harrington and others, 1953). Pearson and others (1964) have recently described nine new cases and reviewed the literature since 1945. These authors found one of three different platelet antigens were implicated in each of their patients. In every case antibody in the mother's blood was active against an antigen present in her infant's and its father's platelets, but absent from her own. This iso-immune type represents about 20 per cent of neonatal thrombocytopenias reported in the literature. The incidence is probably less than 1 in 5,000 live births whereas the chances of incompatability between mothers' and infants' platelet antigens may be 1 in 3 (Pearson and others, 1964). Factors must operate to prevent more frequent sensitization of mothers by their babies' platelets but, as with red cell antigens, these mechanisms remain obscure.

Blood Transfusion

Recipients of blood transfusions, and especially multiple transfusions, sometimes develop iso-antibodies to platelets which may be demonstrated in-vitro, and manifested by a progressively shorter survival time of transfused

platelets in their circulations (Sprague and others, 1952; van de Wiel and others, 1961). Borel and others (1963) have shown that this also occurs in rabbits who are given multiple platelet transfusions. There is a progressive fall in platelet survival time although this is not reflected by a rise in incidence of positivetests for platelet antibodies; this parallels clinical experience. Immunization to platelets is very variable and may develop after a single exposure or not after twenty (Cohen and others, 1961)

The role of platelet iso-antibodies in the production of febrile reactions is uncertain. There seems no doubt that leucocyte iso-agglutinins may be responsible for some febrile reactions (Brittingham and Chaplin, 1957). According to Marchal and others (1960) platelet agglutinins are often found in sera containing leucoagglutinins which makes their roles difficult to separate. It is likely that platelet agglutinins are responsible for some febrile reactions.

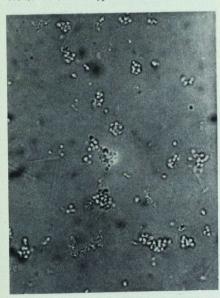
Transfusions of blood from recipients of multiple transfusions may, if they contain platelet antibodies, produce thrombocytopenia in the patients who receive them (Harrington, 1954). A curious type of transfusion-induced

thrombocytopenia has been described by Shulman and others (1961) in the recipient of an antigenically heterologous platelet transfusion. It is suggested that foreign platelet antigen survived in this recipient's circulation longer than the period of antibody induction, and that antibody-antigen complex formed as a result was absorbed by autologous platelets. This is a similar mechanism to the one which, according to Shulman (1958), may operate in sedormid purpura.

Thrombocytopenia sometimes follows transfusion of large amounts of stored blood. When this occurs it is not usually due to platelet agglutinins and the cause is unknown.

Miscellaneous Conditions

Platelet antibodies have been described occasionally in various conditions not necessarily associated with thrombocytopenia. These include carcinomatosis, leukæmia, acquired hæmolytic anæmia, disseminated lupus erythematosus, anaphylactoid purpura, secondary thrombocytopenia, liver disease, virus infections, post-immunization states and even normal persons (Harrington, 1954; Stefanini and Dameshek, 1962). In some of these cases the plate-



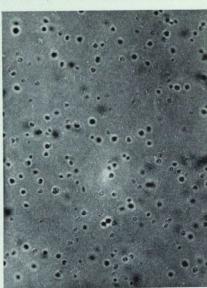


Fig. 3.—Agglutination of platelets by plasma from patient in Fig. 1 in presence of a trace of quinidine (left).

No agglutination is seen when quinidine is absent (right).

let antibodies found may have been due to previous blood transfusions.

Results of some of the platelet agglutinin tests carried out in this hospital in recent years are shown in Tab. 1. In many of these patients blood transfusions had been received. As most of these cases were thrombocytopenie their plasma was tested against suspensions from group O donors.

Platelet antibodies have not commonly been detected in leukemia (Tullis, 1961). Thrombocytopenia is an occasional complication of glandular fever and Radel and Schorr (1963)

have recently reviewed 29 cases in the English literature and found the sex incidence different from ITP. Rather surprisingly they found only one case in which platelet antibody was sought and it was not detected. In the only case of thrombocytopenia complicating glandular fever in which we have tested for platelet agglutinin it was present, and gave quite strong agglutination (Fig. 4).

Platelet antibody has not been found in thrombotic thrombocytopenic purpura (TTP) nor does transfusion of TTP plasma into normal subjects produce thrombocytopenia. Platelet survival is, however, reduced probably due to the vascular lesions (Stefanini and Dameshek. 1962).

Conclusions

The clinical significance of platelet antibodies is not as clear today as one would have hoped fifteen years ago when research in this field seemed to get off to a flying start. This is certainly because no simple test yielding reproducible results has yet been devised or accepted. despite much effort and ingenuity to this end.

It is generally agreed that platelet iso-antibodies play a role in neonatal thrombocytopenia, and in some forms of thrombocytopenia and of febrile reactions which may occur with blood transfusion. Platelet antibody tests will probably be used more in blood transfusion work, but definition of a platelet group system is still very imperfect.

Platelet auto-antibodies may readily be

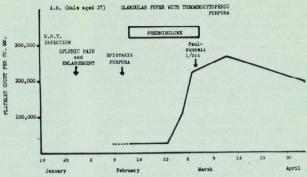


Fig. 4.—Platelet levels in a 27-year-old mun with glandular fever who had platelet agglutinations in his plasma.

demonstrated in some forms of drug purpura and this is of real diagnostic value.

In ITP there is much conflict of evidence about the existence of auto-antibodies. A majority of investigators have reported finding platelet antibodies, and almost all accept that some cases of ITP are auto-immune in origin.

There is clearly still a great deal to be learnt about platelet antibodies, and the main obstacle to progress remains the difficulty of detecting

Chronic lymphocytic leukæmia	12/19
Acute leukæmia	3/5
Other leukæmias	3/7
Glandular fever	1/8
Idiopathic thrombocytopenic purpura	8/15
Acquired hæmolytic anæmia	4/4
Disseminated lupus erythematosus	1/3

Table 1. Incidence of positive tests for platelet agglutinins in various conditions.

Acknowledgement

The illustrations in Figs. 1-4 were from patients under the care of Sir Ronald Bodley Scott who kindly allowed me to study them.

REFERENCES

- ACKROYD, J. F. (1949); Clin. Sci., 7, 249. ACKROYD, J. F. (1955); Brit. Med. Bull., 11, 28. BEDSON, S. P. (1922); J. Path. Bact., 25, 94.
- BOLTON, F. G., and DAMESHEK, W. (1956); Blood, 11, 527.

- 5. BOREL, Y., BALDINI, M., and EBBE, S. (1963): Blood, 21, 674.
- BRITTINGHAM, T. E., and CHAPLIN, H. C. F. (1957): J.A.M.A., 165, 819.
- 7. CHALMERS, D. G., COOMBS, R. R. A., GURNER, B. W., and DAUSSET, J. (1959): B. J. Hamatol., 5, 225.
- COHEN, P., GARDNER, F. H., and BARNETT, G. O.
- (1961): N. Engl. J. Med., 264, 1350. CORN, M., and UPSHAW, J. D. (1962): Arch. intern. Med., 109, 157.
- DAUSSET, J., COLOMBINI, J., and COLOMBINI, M. (1961): Blood, 18, 672. EPSTEIN, R. D., LOZNER, E. L., COBBEY, T. S., and Davidson, C. S. (1950): Amer. I. Med.,
- 9 44 EVANS, R. S., and DOUANE, R. T. (1949): Blood,
- 4. 1196. 13. EVANS, R. S., TAKAHASHI, K., DOUANE, R. T.,
- PAYNE, R., and Liu, C. (1951): Arch intern. Med., 87, 48.
- GUREVITCH, J., and NELKEN, D. (1954): Nature, 173, 356. HARRINGTON, W. J., MINNICH, V., HOLLINGS-WORTH, J. W., and MOORE, C. V. (1951):
- J. Lab. clin. Med., 38, 1 HARRINGTON, W. J., SPRAGUE, C. C., MINNICH, V., MOORE, C. V., AHLVIN, R. C., and Dubach, R. (1953): Ann. intern. Med., 38,
- HARRINGTON, W. J. (1954): Sang., 25, 712. JACKSON, D. P., SCHMID, H. J., ZIEVE, P. D., LEVIN, J., and CONLEY, C. L. (1963): J. clin.
- Invest., 42, 383. KISSMEYER-NIELSEN, F. (1953): Vox Sang., 3,
- McKenna, J. L., and Pisciotta, A. V. (1962): Blood, 19, 664.

- 21. MARCHAL, G., DAUSSET, J., and COLUMBINI, J. (1960): Commun. 8th Internat. Cong Blood Trans.. Tokvo
- MOULINIER, J. (1955): Sang., 26, 811.
- PEARSON, H. A., SCHULMAN, N. R., MARDER, V. J., and CONE, T. E. (1964): Blood, 23,
- 24. POSNER. A. C. (1937): Amer. J. Obstet. Gynec., 34, 155.
- RADEL, E. G., and SCHORR, J. B. (1963): J. Pediat., 63, 46.
- 26. SHULMAN, N. R. (1958): J. exp. Med., 107, 697 and 711.
- 26. SHULMAN, N. R., ASTER, R. H., LEITNER, A., and HILLIER, M. C. (1961): J. clin. Invest, 40,
- 28. SPRAGUE, C. C., HARRINGTON, W. J., LANGE, R. D., and Shapleigh, J. B. (1952): J.A.M.A., 150, 1193.
- 29. STEFANINI, M., CHATTERJEA, J. B., DAMESHEK, W., ZANNOS, L., and SANTIAGO, E. P. (1952): Blood, 7, 53.
- 30. STEFANINI. M., PLITMAN. G. I., DAMESHEK, W., CHATTERJEA, I. B., and MEDNICOFF, I. B. (1953): J. Lab. clin. Med., 42, 723.
- 31. STEFANINI, M., and DAMESHEK, W., The Hemorrhagic Disorders, (1962): 2nd Ed., New York, Grune and Stratton.
- 32. STEINKAMP, R., MOORE, C. V., and DOUBEK, W. G. (1955): J. Lab. clin. Med., 45, 18.
- SUHRLAND, L. G., ARQUILLA, E. R., and WEIS-BERGER, T. S. (1958): J. Lab. clin. Med., 51,
- Tullis, J. L. (1961): Ann. Int. Med., 54, 1165.
- UPSHAW, J. D. (1962): Blood, 20, 761. VAN DE WEIL, T. W. M., VAN DE WEIL-DORF-MEYER, H., and VAN LOGHEM, J. J. (1961): Vox Sang., 6, 641.

NEW SPECIMENS ADDED TO THE MUSEUM **DURING THE YEAR 1963**

Museum No.	Specimen	Clinician
A. 385	Osteogenesis imperfecta	Mr. Fraser
A. 596	Osteogenic sarcoma of femur	Mr. Burrows
A. 651b	Multiple myeloma (Femur and spine)	Dr. Bodley-Scott
B. 17	Rheumatoid arthritis (Finger)	Dr. Cullinan
B. 20	Chronic atrophic polychondritis	Dr. Balme
C. 24 TC.V.40	Kyphosis due to osteoporosis associated with malabsorption syndrome	Dr. Spence
E. 36 E. 172 E. 191	Fibrinous pericarditis (Post-operative) Myocardial infarction Myocardial infarction with rupture of inter- ventricular septum	Mr. Hill Dr. Spence Prof. Scowen
F. 283b	Thrombosed saphena varix	Mr. Birnslingl
F. 291	Cerebral sinus thrombosis	Mr. Nash

G. 175	Carcinoma of maxillary antrum	Mr. Fuller
H. 141 H. 142b	Atypical bronchopneumonia with "abscesses" Chronic suppurative aspiration pneumonia complicated by aspergillosis	Dr. Bodley-Scott Dr. Hayward
H. 166	"Honeycomb" lung due to histiocytic reticulosis (Eosinophil granuloma)	Dr. Spence
K. 184a	Giant rugal hypertrophy of stomach	Presented by Mr. Lunn
L. 127 L. 163d L. 234 TC.VI.51	Pneumatosis coli Carcinoid tumour of ileum with metastasis in lymph node Acute appendicitis	Mr. Tuckwell Presented by Mr. Robinson Mr. Naunton
L. 354	Carcinoma of peri-anal skin	Morgan Mr. Hunt
N. 8a N. 11a TC.VIII.49 N. 160 TC.XI.27 N. 224 N. 299 TC.XI.42b	Chronic venous congestion of liver Chronic venous congestion of liver and spleen Secondary carcinoma of liver Obstruction of the common bile-duct by a stone Islet-cell tumour of pancreas	Dr. Spence Mr. Hill Dr. Hayward Dr. Cullinan Mr. Birnstingl
P. 159 P. 192 P. 230b	Secondary carcinoma of spleen Nodular goitre Parathyroid adenoma with osteitis fibrosa	Dr. Bodley-Scott Prof. Taylor Mr. Birnstingl
P. 231d	cystica Secondary parathyroid hyperplasia with renal osteodystrophy	Dr. Spencer
Q. 23 Q. 25 Q. 51 TC.X.18	Recent infarcts of kidney 8-day-old infarct of kidney Chronic glomerulonephritis (Membranous type	Prof. Scowen Prof. Taylor Dr. Hayward
Q. 58 TC.X.4a	or Ellis Type II) Acute pyelonephritis with papillary necrosis in	Dr. Spence
Q. 68 Q. 88 Q. 268	diabetes Acute suppurative pyelonephritis Genito-urinary tuberculosis Wilms' tumours in twins	Mr. Tuckwell Mr. Badenoch Mr. Nash
R. 78	Carcinoma of urinary bladder	Mr. Badenoch
T. 145c	Hæmangioblastoma of cerebellum	Mr. O'Connell
U. 133	Retinoblastoma	Mr. Stallard
V. 52 TC.I.43 V. 54 V. 89	Healed tertiary syphilis (Skin of leg) Chromoblastomycosis (Hand) Keratoacanthoma	Dr. Nicol Mr. Tuckwell Mr. Hunt
W. 12	Infantile uterus with absent ovaries (Turner's	Dr. Bodley-Scott
W. 61	syndrome) Thecoma of ovary Dermoid cyst of ovary	Presented by Mr. Bourne Mr. Bourne
W. 74	Septic abortion	Dr. Spencer
X. 65 Y. 14	Mammary duct ectasia (Plasma cell mastitis)	Presented by Mr. Tuckwell and Dr. Brewer
ML. 15	Hydrochloric acid poisoning	Presented by Prof. Spector.

TWO SPECIMENS OF PARTICULAR INTEREST FROM THE DUCTLESS GLAND SECTION

by W. J. Hanbury

Curator of the Pathology Museum.

PARATHYROID ADENOMA WITH OSTEITIS FIBROSA CYSTICA

P.230b.

A composite specimen including a bisected parathyroid tumour and longitudinal sections of a clavicle, humerus, second metacarpal and the upper part of a femur. The bones show varying degrees of osteoporosis with irregular expansions and areas of fibrosis, brownish discolouration, osteoid formation and cystic change. X-ray photographs are mounted at the back of the specimen.

Microscopic Examination

The parathyroid tumour is an adenoma, composed mainly of chief cells. Sections of the bones show resorption of trabeculae, with areas of fibrous tissue replacement, cystic change, hæmosiderin deposits and osteoid tissue. No osteoclastic activity can be seen, however, and the appearances are those of a healing stage of hyperparathyroidism.

From a woman, aged 39, who had a history of hæmatemesis 2½ years before death. A partial gastrectomy revealed hypertrophic gastric mucosa with many acid-secreting cells. Six months before death there were symptoms of depression, investigations revealing ostellis fibrosa cystica and, later, an anastomotic ulcer, which caused further hæmatemeses. The parathyroid tumour was removed surgically, and one day later the anastomotic ulcer perforated and was sutured. Hæmatemesis and melæna continued, and tetany developed. The patient then became pyrexial, and a laparotomy six days before death revealed a large bleeding ulcer cavity with a gastro-colic fistula. Finally,

there was persistent hypotension with anuria and uræmia. In addition to the changes already described, post-mortem examination revealed multiple islet-cell adenomata in the pancreas, purulent peritonitis, renal tubular calcification and adrenal cortical hyperplasia.

SECONDARY PARATHYROID HYPER-PLASIA WITH RENAL OSTEODYSTROPHY

P.231d.

A composite specimen including one half of each kidney, the parathyroid glands and adjacent structures, and part of the spine.

The kidneys are grossly shrunken and scarred, and there is slight bilateral hydrone-phrosis as well as hydro-ureter. All four parathyroid glands are enlarged to three or four times their normal size, the lower pair being larger and redder than the upper pair. The vertebrae show marked sclerosis, chiefly on either side of the intervetebral discs.

Microscopic Examination

Sections of the kidneys show advanced atrophy and scarring consistent with a diagnosis of old pyelonephritis, initiated many years previously. A section of a vertebral body shows osteitis fibrosa with bone sclerosis, characteristic of renal osteodystrophy in secondary hyperparathyroidism.

From a man, aged 24, who had a long-standing, but rather vague, history of urinary trouble. At the age of 12 an intravenous pyelogram had shown bilateral hydronephrosis and hydro-ureter, but no cause of obstruction was ever found. Death was eventually due to uramia with secondary hypertension.

THE TALO-CALCANEAL INTEROSSEOUS LIGAMENTOUS APPARATUS

Patrick S. C. Bunning

Whilst examining nearly 500 West African calcanei it was noted that they were classifiable into three morphological types as follows:

Type A — Bones showing three discrete superior articular facets.

Type B — Bones showing two discrete superior articular facets.

Type C - Bones showing one discrete superior articular facet.

Type B is the most frequent type to be encountered, 58% in the male, 80% in the female. Only four Type C calcanei were found but in these the medial extremity of the sulcus tali is obliterated and therefore appeared to indicate the effective constituents of the talo-calceaneal ligamentous apparatus.

It was therefore decided to investigate the interosseous talo-calcaneal ligaments in the Nigerian and compare them with the European.

Material and Methods

Twelve adult male and 12 adult female embalmed Nigerian feet were dissected. At dissection 14 of these were found to possess Type B calcanei and 10 Type A.

The same number of adult male and female British feet were also dissected for comparison with the African. Thirteen of these possessed Type A calcanci and 11 Type B.

Results and Conclusions

Dissection of the West African and European feet found to have calcanei of Types A and B facetal pattern demonstrated no very marked differences between both races with the exception in Africans of both sexes that the following ligaments were consistently better developed:

(a) Cord-like cervical ligament of the talus. The Cervical Ligament (Gray, 1962).

(b) Posterior fibres of the tibio-calcaneal part of the deltoid ligament of the ankle joint.

(c) Calcaneo-fibular portion of the lateral ligament of the ankle joint. This ligament also showed a bifasciculate arrangement of its fibres.

It was observed in both West African and European feet that firstly the ligament of the canalis tarsi (Smith, 1958) sometimes called the interosseous talo-calcaneal ligament (Gray, 1962), secondly the medial root of the inferior extensor retinaculum (Barclay Smith, 1896; Smith, 1958) (the inferior extensor retinaculum is sometimes named the frondiform ligament (Retzius, 1840) or the fundiform ligament (Last, 1952) and thirdly the capsular ligamentous fibres of the talo-calcaneonavicular and subtalar articulations on either side of the canalis tarsi, varied considerably in their degree of development from subject to subject. They were however, in all cases clearly definable individual structures.

In none of the West African or European dissections did the ligament of the canalis tarsi consist only of well developed capsular fibres of the talo-calcaneo-navicular and subtalar joints as has been described previously (Wood Iones, 1944) or as anterior and posterior bands diverging up in a V shape manner (Last, 1952).

The fibres of the ligaments of the canalis tarsi were arranged in nearly parallel coarse bundles which together formed a wide bandlike structure whose width was approximately the length of the canal. The laterally situated fibre bundles clearly formed the thickest and strongest part of the ligament. It was observed that the fibres of the ligament of the canalis tarsi passed obliquely upwards and laterally from their attachment to the middle of the non-articular canal floor. Their superior attachment as described previously (Smith, 1958) was to a well defined bony ridge on the non-articular canal roof situated anterior to its middle and also anterior to numerous vascular foramina. This bony ridge lies also just posterior to the sight of attachment of the capsular ligament of the talo-calcaneo-navicular articulation.

The only fibre bundles not parallel to those of the ligament of the canalis tarsi were those of the medial root of the inferior extensor retinaculum which were adherent to them to a varying degree. The medial root of the inferior extensor retinaculum in the specimens dissected lay posterior to the ligament of the

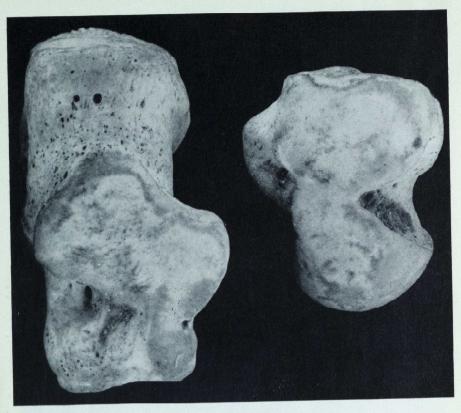


Fig. 1.—The Calcaneus and Talus.

canalis tarsi. (It is described as sometimes passing through or anterior to the ligament of the canalis tarsi (Smith, 1959)). The majority of the fibres of the medial root gained attachment to the non-articular floor and the remainder continued further medially to attach to the non-articular roof.

No fundamental difference in the soft tissue structures between the sexes or between feet possessing Type A and Type B calcanei was observed.

There is no apparent functional significance associated with these dissection findings as the range of movement of inversion and eversion when specifically tested for actively and passively appears to be as great in the Nigerian

Explanation of Fig. 2 (opposite)

a - Dorsal talo-navicular ligament

b = Bifurcate ligament

c = Posterior facet of the navicular

d = Cervical ligament of talus

e = Spring ligament

f = Single distal superior facet of culcuneus

g = Ligament of the canalis tarsi

h = Lateral malleolar facet of the talus

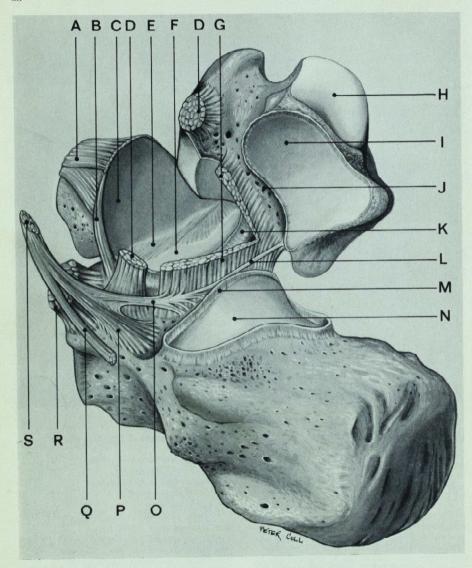
i = Inferior facet of the body of the talus

i = Vascular foramina in the sulcus tali

k = Capsular ligament of the talo-calcaneo-navicular

1 - Medial extremity of the medial root of the inferior extensor retinaculum

m = Capsular ligament of the subtaloid joint



n = Proximal superior facet of the calcaneus

o = Medial root of the inferior extensor retinaculum

p = Intermediate root of the inferior extensor retinaculum

q = Lateral root of the inferior extensor retinaculum

r = Extensor digitorum brevis muscle

s = Inferior extensor retinaculum

as in other races. It should be remarked however, that the movements of inversion and eversion in the West African appear to be considerably restricted whilst walking over rough ground surface in bare feet.

Though Type C specimens with a single superior articular facet only constitute a very small percentage of all the calcanei examined, their very occurrence affords indirect evidence as to which portions of the talo-calcaneal ligamentous apparatus is the most effective functionally. From the nature of the case this must comprise:

I. The cervical ligament of the talus.

II. The laterally situated remnants of

(a) The ligament of the canalis tarsi. (b) The postcrior capsular ligament of

the talo-calcaneo-navicular joint. (c) The anterior capsular ligament of

the subtalar joint. (d) The medial root of the inferior

extensor retinaculum.

The medial portions of the above structures it is obvious cannot exist, as the site of attachment of these fibres to the non-articular floor and roof of the canalis tarsi is occupied by articular cartilage. A fortiori the cervical ligament of the talus and the most laterally situated ligamentous structures in the tarsal canal must represent the effective talo-calcaneal interosseous ligamentous apparatus.

No foot with a Type C calcaneous was dissected.

The interosseous ligaments in Nigerian and European feet have been described and compared. The lateral constituents of this ligamentous apparatus appear to comprise the effective portion.

Acknowledgements

I would like to thank Professor Alastair C. Smith for making this skeletal material available to me and for his assistance and advice. I am grateful to Mr. D. G. Stuart for the photographing of the bones. I am also grateful to Mr. Peter Cull of the Medical Illustration Unit of St. Bartholomew's Hospital Medical College, for his endless patience in producing the drawing. I would like to thank Professor A. J. E. Cave for reading the proofs and for his helpful criticism.

Literature Cited

BARCLAY SMITH, F. (1896): The Astragalo-Calcaneonavicular joint, J. Anat., Lond., 30, 390-412.

GRAY, H. (1962): Gray's Anatomy Descriptive and Applied, 33rd Edition. Lond.: Longmans, 559-

LAST, R. J. (1952): Specimens from the Hunterian Collection (7). The Subtalar Joint, *J. Bone Jt. Surg.* 34B, 116-119.

SMITH, J. W. (1958): The ligamentous structures in

the canalis and sinus tarsi, I. Anat., Lond., 92, 616-620

REIZIUS, A. (1840): Aumarkningar om ett slungfromigt band I sinus tarsi hos menniskan och atskilliga djur, K. Vet. Akad. Handl, 227-238.

Wood Jones, F. (1944): Structures and function as seen in the foot. Bailliere, Findall & Cox, Lond., 58 and 118.

RECENT PAPERS BY BART'S MEN

ABERCROMBIE, G. F. Lectures on general practice. Med. Digest, 9, June, 1964, pp. 269-271.

ABRAHAMS, Sir ADOLPHE. Medicine, murder and man. Comment. Med. Digest, 9, 1964, p. 281.
*BACKHOUSE, K. M. The anæsthesia of marine mammals. Small Animal Anæsthesia, 1964, pp. 79-85.

The gubernaculum testis hunteri: testicular descent and maldescent. Ann. roy. Coll. Surg.

Engl., 35, July, 1964, pp. 15-33.

-, (and HEWER, H. R.). Features of reproduction in the grey seal. Med. biol. Illus., 14, July, 1964, *BELL, Sir ARTHUR. The origin and aims of our

College. Aust. N.Z. J. Obstet. Gynæc., 4, March, 1964, pp. 1-7.

BOULTON, T. B. Symposium on the teaching of general anæsthesia for dental surgery. Anæsthesia, 19, July, 1964, pp. 445-449.

RRAIMBRIDGE, M. V. Surgery of the descending

thoracic aorta. Nurs. Times, 60, July 17, 1964, pp. 929-933.

BRAITHWAITE, F., (with Crymble, B.). Anomalies of the first branchial cleft. Brit. J. Surg., 51, June, 1964. pp. 420-423.

*Brown, J. R. Industrial fatigue. Med. Serv. J. Canada, 20, March, 1964, pp. 221-231. The public health hazards of bathing. Med.

Serv. J. Canada, 20, Feb., 1964, pp. 135-147. *---, (with others). Bromide disinfection of a large swimming pool. Canad. J. publ. Hlth., 55, June,

1964, pp. 251-256.
*Burkitt, E. A., (and Walker, J. V.) Community care. Med. Offr., 112, July 17, 1964, pp. 53-54.

*Casson, F. R. C. Afraid to go out? Family Doctor. August, 1964, pp. 461-463.

Growing-up pains. Family Doctor, Sept., 1964, pp. 542-543.

*Chamberlain, D. A., and Howard, Jane. Guan-ethidine and methyldopa: a hæmodynamic study. Brit. Heart J., 26, 1964, pp. 528-536. , and HOWARD, JANE. The hæmodynamic effects

of B-sympathetic blockade. Brit. Heart J., 26, 1964, pp. 213-217.

, see also APTHORP, G. H., and others. CLIFTON, MARJORIE, see MOULDS, WINIFRED, and

COLE, P. V. Automatic safety cut-out for cardiac by-pass machine. Brit. med. J., May 30, 1964. p. 1198

CRAWHALL, J. C., and others. Further observations on the use of D-penicillamine in cystinuria. Brit. med. J., May 30, 1964, pp. 1411-1413.

CUNNINGHAM, G. J., (with others). Histo-chemical studies on the human endometrium. Lancet. July 11, 1964, pp. 56-59.

CURWEN, M. P., (with Francis, R. S.) Major sur gery for pulmonary tuberculosis: final report. Tubercle, 45, June, 1964, Supplement,

DAWSON, J. B. Auscultation and the stethoscope. Practitioner, 193, Sept., 1964, pp. 315-322.

DE ALARCON, R., and HODSON, J. M. Value of the general practitioner's letter. A further study in medical communication. Brit. med. J., Aug. 15, 1964, pp. 435-438.

DONALDSON, M. Cancer education of the public. Oxford med. Sch. Gaz., 16, 1964, pp. 10-11.

Dossetor, J. B., (and others). Brain urea and water changes with rapid hemodialysis of uremic dogs. Trans. Amer. Soc. Artif. Int. Organs, 10, 1964,

*Evans, Sir Charles Lovatt, Reminiscences of Bayliss and Starling. First Bayliss-Starling Memorial Lecture. J. Physiol., 170, 1964, Supplement.

*FINLAYSON, R., (and SYMONS, C.) Comparative aspects of arterial disease. Biological Aspects of Occlusive Vascular Disease, 1964, pp. 333-340. FLAVELL, G. Management of serious chest injuries.

Nurs. Mirror, June 5, 1964, pp. xi-xiii.
FOWLER, J. F., see KARZMARK, C. J., and others.
*FRANKLIN, A. WHITE. Children's hospitals. The Evolution of Hospitals in Britain, ed. by F. N. L. Poynter, 1961, pp. 103-121.

The delayed reader and the pædiatrician. Lond. Clinic med. J., 5, July, 1964, pp. 27-35. *HANBURY, W. J. Bronchogenic carcinoma in women.

Thorax, 19, July, 1964, pp. 338-342. *HAVARD, C. W. H. Potassium depletion. Curr. Med. Drugs, 4, June, 1964, pp. 16-23. HEATHFIELD, K. W. G., and JEWESBURY, E. C. O.

Treatment of petit mal with ethosuximide. Brit. med. J., Sept. 5, 1964, p. 616.

HECTOR, WINIFRED E. Making a programme. I. Nurs. Times, June 5, 1964, p. 738; II.June 12, 1964, p. 777; III.June 19, 1964, pp. 809-810; IV.June 26, 1964, p. 844.

HIBBARD, B. M. The role of folic acid in pregnancy. V. J. Obstet. Gynæc. Brit. Comm., 71, Aug., 1964, pp. 529-542.

The third stage of labour. Brit. med. J., June 6, 1964, pp. 1485-1488.

HODSON, J. M., see DE ALARCON, R., and ---HOWARD, JANE, see CHAMBERLAIN, D. A., and -*Hugh-Jones, K., and others. Some experiences in managing sickle-cell anæmia in children and young adults, using alkalis and magnesium. Brit. med. J., July 25, 1964, pp. 226-229.

*HUNT, J. H. General practice in the world today and its academic needs. Lancer, July 11, 1964, pp. 84-86.

*HUNTER, R. A., (and others). A syndrome of abnormal movements and dementia in leucotomized patients treated with phenothiazines. J. Neurol. Neurosurg. Psychiat., 27, 1964, pp. 219-223.

HURT, R. L. Cannulæ for profound hypothermia. Brit. med. J., May 30, 1964, p. 1198.

JEWESBURY, E. C. O., see HEATHFIELD, K. W. G.,

JOEKES, A. M., (with GHOSE, R. R.) Treatment of severe aspirin poisoning without dialysis. Lancet, June 27, 1964, pp. 1409-1412.

, (with SHERWOOD, T.) The clinical "renogram" as a guide to renal function. Brit. J. Radiol., 37, 1964, pp. 645-652.

Joels, N., and Neil, E. The action of some metabolic inhibitors on the chemoreceptor activity of the carotid body. J. Physiol., 171, June, 1964, pp. 43P-44P.

JONES, F. AVERY, see MISIEWICZ, J. J., and others. *JONES, R. F. McNAB. Experiences with hydrogen peroxide perfusion in radiotherapy for cancer of the head and neck. Proc. roy. Soc. Med., 57, July, 1964, pp. 639-641.

KARZMARK, C. J., and others. Lithium fluoride thermoluminescence dosimetry. Phys. in Med.

Biol., 9, July, 1964, pp. 273-286.

Kersley, G. D., (and others). Tomography in arthritis of the small joints. Ann. rheum. Dis., 23, 1964, pp. 280-287.

KNOX, R., (and PICKERILL, J.) Efficient air removal from steam sterilizers without the use of high vacuum. Lancet, June 13, 1964, pp. 1316 1321

*LAMBLEY, D. G. Some observations on the surgical treatment of peptic ulcer. Northants Gen. Hosp.

Clin. Rep., 1964, pp. 43-46.

Lehmann, H Blood transfusion requires blood storage. Proc. roy. Soc. Med., 57, July, 1964, (with others). Hæmoglobin G Accra. Nature,

203, July 25, 1964, pp. 363-365.

see Hugh-Jones, K., and others. L'ETANG. H. The M.O. merely did his duty. Med. News, Sept. 4, 1964, p. 16. Some unusual medical students. Practitioner.

193, July, 1964, pp. 96-100. *LUMB, G., (and HARDY, L. B.) Technique for dis-

section and perfusion of heart. Arch. Path., 77, March, 1964, pp. 233-238. McALISTER, JOAN M., see HUGH-JONES, K., and

others. MACFARLANE, R. G. The development of ideas on fibrinolysis. Brit. med. Bull., 20, Sept., 1964, pp. 173-178.

Fibrinolysis: introduction. Ibid, pp. 171 172. MCMENEMEY, W. H., (with others). Serum lipoproteins in multiple sclerosis determined by cellulose acetate electrophoresis. J. Neurol. Neurosurg Psychiat., 27, 1964, pp. 251-254.

*Medvei, V. C. Teams and their leaders. Lancet, May 30, 1964, pp. 1213-1214.

MISIEWICZ, J. J., and others. Comparison of oral and rectal steroids in the treatment of proctocolitis. Proc. roy. Soc. Med., 57, July, 1964,

*MORRIS, G. C. R., (and SWAYNE, G. W.). Histochemical studies of carbonic anhydrase in the salivary glands of rabbits. J. Physiol., 171, May, 1964, pp. 5P-6P.

*-- (with others). The paratoid saliva of Macaca irus. I. Physiol., 171, May, 1964, pp. 16P-17P. *Moulds, Winifred, and Clifton, Marjorie. Air pollution in Sheffield; changes with time, 1957-61. Int. J. Air Wat. Poll., 7, 1963, pp. 1051-1055.

NEIL, E., see JOELS, N., and NICOLSON, I. C. Across the Sahara with pill and 'compo'. Med. News. Aug. 24, 1964, p. 10.

*O'CONNELL, J. E. A. Primary spontaneous cerebro-spinal fluid rhinorrhoea. J. Neurol. Neurosurg. Psychiat., 27, 1964, pp. 241-250.

PAINTER, N. S., (and TRUELOVE, S. C.). The intraluminal pressure patterns in diverticulosis of the colon. Gut. 5, 1964, Part I, pp. 201-207; Part II, pp. 207-213; Part III, pp. 365-369; Part IV, pp. 369-373.

*PARTINGTON, M. W. Case-finding in phenylketonuria. I. Report of a survey by the College of General Practice of Canada. Canad. med. Ass. J., 90, June 6, 1964, pp. 1312-1315. II. The Guthrie test. *Ibid*, 91, July 18, 1964, pp. 105-114.

Waardenburg's syndrome and heterochromia wanted by the serious in a deaf school population. Canad. med. Ass. J., 90, April 25, 1964, pp. 1008-1017.

—, (with MATTHEWS, J.) The plasma tyrosine

levels of premature babies. Arch. Dis. Childh., 39. Aug., 1964, pp. 371-378.

POTTER, J. M. Facial palsy following head injury.

J. Laryng., 78, July, 1964, pp. 654-657.

—, (with others). Early diagnosis of herpes simplex encephalitis by brain biopsy. Lancet, Aug. 15, 1964, pp. 332-334.

PRANKERD, T. A. J. Glucose 6-phosphate dehydro-

genase deficiency. Proc. roy. Soc. Med., 57, June, 1964, pp. 506-508.

RADCLIFFE, W. Thomas Tunmer—and a forgotten

spa. Practitioner, 193, Sept., 1964, pp. 363-367.
*RAVEN, R. W., (and DAWSON, I.) Malignant melanoma of the esophagus. Brit. J. Surg.,

51, July, 1964, pp. 551-555.

Renbourn. E. T. Clothing: physiology, hygiene and psychological aspects. Part I. Curr. Med. Drugs, 4, Aug., 1964, pp. 3-31.

*ROBERTS, D. C., (and COLE, G. E.) Some mechanisms of formation of polypoid and heteropoid cells in a murine ascites tumor in vitro. J. Nat. Cancer Inst., 32, May, 1964.

Ross, Sir James Paterson. Forty years ago—and now. Brit. J. Radiol., 37, Aug., 1964, pp. 565-

ROTBLAT, J. Scientists as peacemakers. New Scientist, 22, June 4, 1964, pp. 619-620.

-. Scientists' responsibility in the atomic age. Essex Hall Lecture, 1964, 1964.

*ROTHNIE, N. G. A rapid and simple method for estimating fibrinogen. J. clin. Path., 17, 1964,

ROTHWELL-JACKSON, R. L., see WEALE, F. E., and

*SAVAGE, O., (with others). Side-effects of long-term treatment with cortico-steroids and corticotrophin. Lancet, May 23, 1964, pp. 1121-1123.

Scowen, E. F., see Crawhall, J. C., and others. -, see Thould, A. K., and

*SEDDON, Sir HERBERT J. Volkmann's ischæmia. Brit. med. J., June 20, 1964, pp. 1587-1592.

*SIMMONDS, F. A. H. Delayed regional adenitis after BCG vaccination. Tubercle, 45, 1964, pp. 160-

SLEIGHT, P., and WIDDICOMBE, J. G. Action potentials in nerve fibres from left ventricular receptors in the dog. J. Physiol., 171, June, 1964, pp. 34P-

SPECTOR, W. G., see WILLOUGHBY, D. A., and-TAYLOR, G. W., see WEALE, F. E., and others.

THEOBALD, G. W., (with others). Potentials evoked in the hypothalamus and cerebral cortex by electrical stimulation of the uterus. Nature, 203, Aug. 8, 1964, pp. 654-656.

THOMAS, D. P., (and WESSLER, S.) Statis thrombi induced by bacterial endotoxin. Circ. Res., 14, June, 1964, pp. 486-493.

THORNE, N. The skin clinic. Brit. J. clin. Pract., 18, Aug., 1964, pp. 491-494.

Cosmetics and the dermatologist. Hair colourings. Part I. Brit. J. clin. Pract., 18, July, 1964, pp. 427-430.

THOULD, A. K., and Scowen, E. F. The syndrome of congenital deafness and goitre. J. Endocr., 30, 1964, pp. 69-77.

*TODD, R. M., and NEVILLE, J. G. The sequeæ of tuberculous meningitis. Arch. Dis. Childh., 39, June, 1964, pp. 213-225.

*TURNER, P. Critical flicker fusion frequency and its modification by a conditioning stimulus of a flickering light. J. Physiol., 171, May, 1964, pp. 6P- 8P.

WARREN, C. B. M., (and BROUGHTON, P. M. G.)
Basal copper excretion in Wilson's disease.
Arch. Dis. Childh., 39, June, 1964, pp. 265-267.

WATERWORTH, PAMELA M., (with BARBER, MARY). Penicillinase-resistant penicillins and cephalosporins. Brit. med J., Aug. 8, 1964, pp. 344-349.

-, (with BARBER, MARY). Antibacterial activity of lincomycin and pristinamycin: a comparison with erythromycin. Brit. med. J., Sept. 5, 1964, pp. 603-606.

pp. 603-606.

WATTS, R. W. E., (and others). The enzyme defect in xanthinuria. *Biochem. J.*, 90, 1963.

—, see also Crawhall, J. C., and others.

*Weale, F. E. A comparison of barber's and postanal pilonidal sinuses. *Brit. J. Surg.*, 51, July, 1964, pp. 513-516.

-. Haemodynamics of incomplete arterial obstruction. Brit. J. Surg., 51, Sept., 1964, pp. 689-

—. The value of series and parallel resistance in

steady blood-flow. Brit. J. Surg., 51, Aug., 1964, pp. 623-627.

-, and others. The measurement of regional

—, and others. The measurement of regional vascular resistance at operation. Brit. J. Surg., 51, Aug., 1964, pp. 627-629.

WHITE, J., see KARLMARK, C. J., and others.

WIDDICOMBE, J. G., see SLEIGHT, P., and —.

*WILLIAMS, I. G. Modern methods in radiotherapy. Nurs. Mirror, 118, May 29, 1964, pp. iv, vii; and June 5, 1964, pp. i-iii.

WILLOUGIBY, D. A., and Spector, W. G. Adrenaline precursors in the inflammatory reaction. I. Path. Bact. 88, 1964, pp. 159-166.

J. Path. Bact., 88, 1964, pp. 159-166.
*WITTS, L. J. Pernicious anamia and endocrine disease. Israel med. J., 22, 1963, pp. 9-10.

-, (with others). Anæmia associated with un-explained occult blood loss. Brit. med. J., May

30, 1964, pp. 1417-1419.
*Reprints received and herewith gratefully acknowledged. Please address this material to the Librarian.

