WEITZMAN, D., and others. The effect of magnesium on blood coagulation in human subjects. *Lancet*, April 18, 1959, pp. 814-815.

WHITE, E. M. A., *see*, BANKS, T. E., and others.

*WIDDICOMBE, J. G. Head's paradoxical reflex. *J. Physiol.*, 145, March, 1959, pp. 27*P*-28*P*.

*WITTS, L. J. (and others). Cortisone and corticotrophin in ulcerative colitis. *Brit. med. J.*, February 14, 1959, pp. 387-394.

WORMALL, A., *see*, BANKS, T. E., TUPPER, R., WHITE, E. M. A., and ——.

YOUNG, F. H. Bronchial asthma. *Chest Heart Bull.*, 22, April, 1959, pp. 42-44.

* Reprints received and herewith gratefully acknowledged. Please address this material to the Librarian.

Fountain Centenary Celebration

A champagne party will be held in the Great Hall on Thursday, October 8th, at 6.0 p.m.

Double tickets 25/-, Single tickets 15/-

These may be obtained from the Clerk and Bursar, at St. Bartholomews Hospital.

ST. BARTHOLOMEW'S HOSPITAL JOURNAL

Vol. LXIII No. 9 **SEPTEMBER 1959**

EDITORIAL

This academic year sees an innovation in the admission for the first time of dental students from the Royal Dental Hospital. They have until now been housed under three widely separated roofs — those of University College, the Royal Free and King's College—and for various reasons the two latter are unable to provide for them any more. Twenty are therefore to start at Bart's this year, increasing to sixty-five in 1961. That there is space enough for another sixty-five students to use the premises at Charterhouse can hardly be denied, although there will be some regrets that the spaciousness and "elbow room" enjoyed at present will be considerably reduced. As regards their course, they will share the whole of the 1st M.B. course and some of the physiology lectures; their anatomy course will be completely separate and is to be held in the old Zoology department.

The introduction of dental students is a break in a very long tradition, and there are some who regard a break with tradition with disfavour, and while it may be true that certain old fashioned customs die hard, this need not be the case in the present matter. On the contrary, the introduction of an outside influence in students pursuing a similar but not identical course should be for the good. Differences of outlook and curriculum lend themselves well to stimulating discussion ultimately to the benefit of both sides. Moreover, an ideal opportunity is provided at an early stage for each to understand the working and scope of a profession with which there must always be the closest co-operation. In some schools, however, there is a deep line of division between medicals and dentals : it is hoped that from the very beginning this will never be the case at Bart's.

Some of the arrangements which have been made will unfortunately not always help this aim of unity at Charterhouse. These students will pay a subscription of £3 to the Students' Union which will give them temporary membership and use of the facilities at Charterhouse Square only. They will not be allowed to use the sports ground at Chislehurst because their own authorities wish them to use their own grounds, and while this wish can be respected and understood as a means of salvaging some integretion of the rather scattered dental students, it will not help integration at Bart's. There may be some justifiable resentment that students who can use the excellent facilities which we have to offer here are not permitted to offer their talents for the benefit of this community. While this may be unfortunate, there should be no reason to allow it to become a bone of contention, if we only consider that these dental students are less fortunate than ourselves, and for the moment our guests, and we extend our cordial welcome to our new colleagues.

COMMENTS ON THE B.M.A. CONFERENCE

In reviewing the subjects discussed at the B.M.A. Conference held in Edinburgh during July, one cannot but be impressed by the large amount of time devoted to a discussion of ethical standards of conduct by members of the medical profession. There is a noticeable tendency towards an attempt to bring these standards into line with trends in medical knowledge, and it is probably rather overdue.

Anonymity in broadcasting has probably provoked more discussion recently than any other topic (the controversy of advertising was the subject of the Editorial in this Journal, June 1959). A proposal that "appearing by name on television or being announced by name over the sound radio is not *per se* unethical, but any practitioner taking part in such activity should be made fully aware of the perilous path which he is treading and the risk which he runs" was lost, and this was probably rather unfortunate. Perhaps the time is not quite ripe for this yet. That Dr. Wand sugested that the Association was a little archaic in its attitude to this subject, is a good sign; it is to be taken up again next year.

The topic of professional secrecy with regard to information of a third party was also argued with vigour. A notion suggesting that "on certain occasions it be necessary to acquiesce in some modification" was carried. One wonders whether the seal of secrecy has been broken once and for all. The danger lies, of course, in the possibility of the loss of an absolute confidence in the profession, and the debate on this subject is always whether or not this possibility outweighs the benefit to the public which derives from a disclosure of information. Even the Hippocratic Oath seems to allow for this eventuality. "And whatsoever I shall see or hear in the course of my profession . . .if it be what should not be published abroad, I will never divulge, holding such things to be holy secrets". It remains a most debatable matter, and one must tread warily.

The publication of the pamphlet "Getting Married" was once again discussed. It is encouraging to find that headings of the nature of "Is chastity outmoded? Outdated? Out?" are vigorously decried by the profession at large. This is in marked contrast to the discussion on Artificial Insemination in which a suggestion was made that ethical and moral principles should not be discussed beside the scientific facts because of widely varying views on the matter. This suggestion, however, was not accepted by the meeting which thereby maintained its dominant note of keeping ethics and morals in harmony with medical scientific progress.

Publicity

The headline "Women in the Eights? Not for us says Bart's," appeared in the lunch-time edition of the "Evening Standard" on September 11th. Many were surprised to see this, many indignant. It provides just one more instance of the peculiar ability of the Press to make public domestic affairs which can at least be a nuisance to the people concerned, if not positively harmful. This item of news could have no possible interest for the general public—a fact which is borne out by its removal from later editions of the paper. Such publicity could have little effect but to stir up animosity amongst those who have been at pains to negotiate this matter delicately in the committee of the United Hospitals' Rowing Club.

There are no copyright laws involved in this incident, for the Journal is acknowledged, and accurately reported. While the freedom of the Press should be extolled, it is a pity that some editorial bodies seem to have little ability to discriminate between matters of delicacy, of sensationalism, and of true interest.

Fifty Years Ago

It appears that interest in Medical Etiquette almost resulted in a series of lectures on this subject. It was thought, however, that the curriculum was already too full and instead an interesting article by J. Valerie appeared in the Journal. The ethical background of Medical Etiquette has not changed and the advice given would still be of value today. It is, however, amusing to note the following:

"A telephone is, of course, a necessity. Let me suggest to you that you cut it off at night after retiring to bed, unless you have a confinement imminent or a very serious case. It is so very easy for nervous people to ring you up unnecessarily, and you will find that urgent cases will always manage to send if you are really wanted."

The Editor comments on the attractions of Bart's for intending medical students, especially as the new Out-Patient and Pathology Departments had just been completed: "Its antiquity may influence some in its favour. Its historical site, its ancient traditions, the long roll of illustrious names connected with its school may well decide many waverers finally to adopt it as their alma mater. Yet on the other hand our Hospital has all the exuberant vitality of youth, and the abundant evidence of this in the working and equipment of our new departments cannot fail to be an inducement to those who look primarily for up-to-date methods and efficiency."

...for the first time in history...

A Unique Occasion

When Professor Sir James Patterson Ross visited the R.A.M.C. Depot at Crookham on June 4th of this year, inspected six to seven hundred recruits on parade, and took the salute at the march past, it was for the first time in history that the President of the Royal College of Surgeons has done so. Sir James himself must have a special loyalty towards the R.A.M.C., T.A., in which he himself served in the early years of the Kaiser's war before he qualified and joined the Senior Service.

He is accompanied in this picture by Colonel W. A. Robinson, O.B.E., M.D., "who made a speciality in assault landings during Hitler's war (Normandy, Sicily, etc.), and by Major Wilson who had an equally adventurous war: having escaped from German hands, he adopted various guises as a civilian, Polish soldier, and French legionnaire, and after six months arrived home via Marseilles, Oran, Dakar and Gambia. With them is also Sergeant Major Rowlands, formerly a mainstay of the Corp's Rugby team".

Acknowledgment

[The picture and accompanying letter were kindly sent by Major-General R. E. Barnsley, C.B., M.C., curator of the R.A.M.C. historical museum.]

B

Dr. Walter Mackenzie

The Hospital was pleased to welcome Dr. Walter Mackenzie as temporary director of the Surgical Unit from 29th June to 9th July. Dr. Mackenzie, who is director of the Department of Surgery in the University of Alberta, Edmonton, was in this country to lecture at Liverpool University and to attend the joint meetings of the British and Canadian Medical Associations in Edinburgh.

During his stay Dr. Mackenzie took ward rounds and held classes in the Surgical Out-Patient Department. He also gave a Clinical Lecture on Islet Cell Tumours.

Hunterian Lecture

Mr. R. L. Huckstep of the Orthopaedic Department will deliver the Hunterian Lecture at the Royal College of Surgeons on Tuesday, 17th November, at 5 p.m. His subject will be "Recent Advances in the Surgery of Typhoid Fever". All members of the staff and students are very welcome.

Rugger Club Dance

On Saturday, 18th July, a large number of people appeared for a dance which never took place. This was unfortunate for these people, for the reputation of these dances, and for that of the Rugger Club by whom it was sponsored. The reason ?—a failure to make sufficient profit on the previous dance; another such failure was not to be risked. The decision was not a good one, and the cancellation notices completely inadequate.

There is considerable competition between the various Sports Clubs to sponsor these dances for the financial reward towards which end they are run. Every undertaking has its risks and it is deplorable that the Rugger Club failed in its responsibility to proceed with such as extensively advertised project. Let us hope that it can manage its finances rather more competently in the year to come.

The Flood

On August 21st, a tropical thunderstorm of proportions almost unknown in this country struck Bart's and the City with a vengeance. The Square was soon inches deep in water, and very soon the the Refectory and various cellars were also inundated. The curious feature of this storm was its very limited character; even in places as near as the West End it was not even raining. One is left to speculate why we deserved such punishment from above.

St. Bartholomew's Day

According to legend, St. Bartholomew, after a life's work of preaching Christianity to the Indians, was martyred by King Astyages, in the year 44 A.D. We are told that he was flayed on the 24th of August, and beheaded on the 25th. Thus, by general agreement, his feast is kept on August 24th.

In keeping with the old traditions of the Church, the Feast was kept as a Holy Day: in some places he is still sufficiently esteemed among pious folk for them to choose his feast as a traditional First Communion day, or as a day of pilgramage to his Shrine or dedicated Church. The Holy Day subsequently became a holiday, and the customs and practices of that day were associated with legends about the Saint. As a result of his flaying, he became the patron of all leather-workers, and eventually of tanners, bookbinders, glove-makers, cobblers, tailors, butchers, and plasterers. They were responsible for one of the most famous St. Bartholomew's Day celebrations, the St. Bartholomew's Fair in Smithfield. Instituted by Rahere in 1133, by Royal Charter from Henry 1st, it soon became one of the most important leather and cloth markets of England. It was traditionally opened by the Lord Mayor, and lasted for two weeks each year. In 1691 it was reduced to four days, and moved to September. This was the beginning of its decline. In 1840 it moved to Islington, but some years later, being condemned as licentious, it was dissolved entirely.

The Feast is still kept here by a service in St. Bartholomew the Less. But the Fair, doubtless very popular, has gone. It is surprising that medics with their almost proverbial capability for celebrating anything at the slightest provocation, do not still follow "The Olde Forme of the Proclamacion of Bartholomew Fayre in King Edwarde the Seconde Hys Reygne . . ." " . . . that all men sellors of Bere, Wyne or Ale sell by measure ensealed as by galon, potell, quarte and pynte a galon of the best ale for iid (2d.) . . . a pynte for qns (¼d.) upon pein that woll fall thereof . . ."

Acknowledgement. These notes were made from the authoratitive series of articles by J. B. Dawson in the Journal of 1956.

AN APPRECIATION: DR. E. B. STRAUSS

Eric Benjamin Strauss retired in February 1959, having served for twenty-one years as Physician in Psychological Medicine at Bart's.

He was born in London on 18th February, 1894 and educated at Oundle and University College School.

After leaving school he travelled abroad to study foreign languages and after war service read medieval and modern languages at New College, Oxford. His outstanding classical scholarship combined happily with his medical and scientific knowledge to the enrichment of his published work, speeches and lectures, and to the enjoyment of his friends and colleagues.

During the first World War he served as Captain in the Infantry Division of the Middlesex Regiment both at home and in the field.

After completing his language studies he started medicine at Oxford and later proceeded to King's College Hospital for clinical studies, qualifying B.M., B.Ch. in 1924.

His postgraduate training in psychological medicine was obtained at Guy's Hospital, the Tavistock Clinic and the Cassell Hospital. He also studied in Germany and worked in close association with the renowned Ernst Kretschmer. He translated Kretschmer's classical textbook of Medical Psychology into English, and Strauss for many years has been the foremost exponent of Kretschmer's teachings in this country. His academic distinctions include M.R.C.P. 1926, D.M. 1930, F.R.C.P. 1939 and an honorary D.Sc. awarded on his sixtieth birthday by the University of Frankfurt.

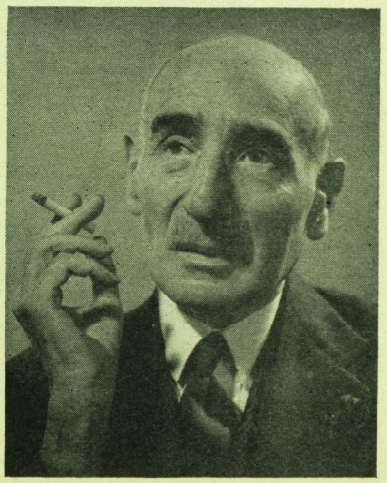
Dr. Strauss arrived at Bart's in 1938 and immediately devoted himself to the development of the practice and the teaching of psychiatry in the hospital. During his 21 years at the hospital he has fostered and promoted the growth of the Department of Psychological Medicine from its early infancy to full maturity.

In many ways psychiatry is one of the most difficult subjects to teach on out-patients to medical students. Dr. Strauss devoted special attention to this form of teaching with great success. Always an interesting and lucid teacher, he influenced students not only by imparting knowledge but also by the fine example given by his kind and understanding approach to patients. He has a broad outlook on psychiatry and is eclectic regarding treatment, employing physical methods or various psychotherapeutic techniques according to the patients' needs. Strauss' therapeutic enterprise and initiative is attested by the fact that the first out-patient clinic in the world for electroplexy, was opened by him at Bart's in 1940.

He took a keen interest in students' activities and has been President of the Students' Union, Vice-President of the Dramatic Society and President of the Boxing Club.

Dr. Strauss in addition to his hospital work, managed to find time in his very busy life for important medical activities. He was elected President of the Section of Psychiatry of the Royal Society of Medicine, Honorary Secretary to the Committee for Psychological Medicine of the Royal College of Physicians and Croonian Lecturer in 1952; President of the British Psychological Society; Examiner for the D.P.M. of the Conjoint Board and was the first President of the Psychoendocrine Association.

In addition to all these activities he has written numerous scientific articles and contributions to books. He is co-author with Sir Russell Brain of "Recent Advances in Neurology and Psychiatry" and a series of his articles appearing in the "Sunday Times"



was recently published as the book "Psychiatry and the Modern World".

Any picture of Dr. Strauss would be very incomplete if reference was not made to his many interests and artistic talents. As well as having considerable talent as an actor he has composed many songs and a recital of his work was given in London a few years ago. He has one of the best collections of long playing records in London and on many occasions has entertained groups of students to musical evenings. He enjoys mountain walks and is a keen swimmer. He has always been ready to help anyone in need and over many years has rendered practical and effective aid to large numbers of doctors from oppressed European countries.

As a personality E. B. Strauss presents a combination of grace, dignity, courtesy and a fine presence. His splendid character was clearly shown during his recent illness and won admiration and provided an inspiring example to everyone.

Since his retirement from the hospital he has continued to be as active as ever, and it is certain that medicine will continue to benefit from his keen intellect, wisdom and knowledge based on long experience and characteristic enthusiasm.

★ ★ ★

Journal Staff

The following appointments have been made: R. Miller is to be Assistant Manager. Miss B. Franklin is to be the Nurses' Representative.

The Journal

The Editor would like to apologise to readers for the late appearance of recent Journals. This is still the result of the recent printing strike which lasted for seven weeks. It is our policy not to miss an issue, but rather to bring them out in as rapid succession as possible: in this way the situation should be recitified before the end of the year.

The Calendar has been re-introduced into this issue and we hope that the Journal will appear while it is still useful.

★ ★ ★

CALENDAR

NOVEMBER

Sun. 1—Medical and Surgical Units and Mr G. H. Ellis on duty.

Mon. 2—Rugger v. Devonport Services (A).

Wed. 4—Rugger v. Penzance (A).
Soccer v. U. C. H. (A).
Hockey v. K. G. S. (A).

Thur. 5 Soccer v. King's College, Cambridge (A).

Fri. 6—Soccer v. Trinity Hall, Cambridge (A)
Dr. Bodley Scott on duty

Sat. 7 Mr. A. H. Hunt on duty
Mr. F. T. Evans on duty
Rugger v. K.C.S.O.B. (A).
Hockey v. Sevenoaks (H).

Mon. 9—Film Society: "San Demetrio London."

Sat. 14—Dr. A. W. Spence on duty
Mr. C. Naunton Morgan on duty
Mr. R. A. Bowen on duty
Rugger v. Old Cranleighians (H).
Soccer v. Middlesex Hospital (H).
Hockey v. Bexley Heath (A).

Wed. 18—Hockey v. Tulse Hill Wanderers (H).

Sat. 21—Dr. G. Hayward on duty
Mr. A. W. Badenoch on duty
Mr. R. W. Ballantine on duty
Rugger v. Old Alleynians (A).
Soccer v. Caledonians (H).

Mon. 25—Film Society: "I vitelloni."

★ ★ ★

Film Society

The second programme on October 26th is a double bill: "Battleship Potemkin" and "Way Out West".

"Way Out West" is a Laurel and Hardy comedy—musical dealing with their adventures in a gold-mining town where they are trying to find the daughter of their late partner to hand over title deeds.

"Potemkin", Eisenstein's silent classic made in 1925 is the story of the mutiny by the sailors of the Battleship Potemkin against their officers during the Russian Revolution of 1905. They are befriended by the people of Odessa who send food and wave to them from a huge flight of steps on the waterfront. This sets the scene for the most influential six minutes in the history of the cinema: the appearance of White Russian soldiers at the head of the Odessa steps and the subsequent panic and massacre of the townspeople. One cannot fail to be gripped by the incredible artistry of this sequence, which set a standard that has hardly been bettered today.

* * *

"San Demetrio, London," on November 9th is an epic, a British film about the tanker of that name belonging to a convoy unsuccessfully but heroically defended by Fegen in H.M.S. Jervis Bay against the Admiral Scheer. San Demetrio was set ablaze and abandoned by her crew. The tanker did not sink and several days later the crew returned and in imminent danger of being blown up, put out the fire and sailed the ship back to England with the greater part of her cargo intact.

This film was directed by Charles Frend for Ealing Studios and is one of the best the semi-documentary films produced during the war.

Adrian Padfield.

★ ★ ★

ANNOUNCEMENTS

Engagements

EVANS—IVOR-JONES. — The engagement is announced between Dr. T. Arwyn Evans and Carys Ivor-Jones.

LANGLEY—DUCKER.—The engagement is announced between David Langley and Susan Ducker.

NEWTON—THOMAS.—The engagement is announced between Dr. Michael A. Newton and Jane Thomas.

Marriages

HALL-SMITH—STODDART.—On June 17th, at the British Embassy Church, Paris, Michael Hall-Smith to Hilda Stoddart.

WELLS—ROLLESTON. — On July 18th, Dr. Bertrand Wells to Jenifer Rolleston, widow of Major S. C. Rolleston, M.C.

Births

NORBURY.—On August 1st, to Jennifer, wife of Dr. Keith Norbury, a son.

TAIT.—On July 14th, to Janet, wife of Dr. Ian Tait, a daughter (Lucilla Jane).

Deaths

CUNNINGHAM. — On July 1st, Arthur John Wellington Cunningham. Qualified 1908.

WADE.—On July 2nd, Dr. Richard Herbert Wade. Qualified 1922.

★ ★ ★

Changes of address

Dr. T. B. Boulton,
Fairfield,
Victoria Road,
Wargrave,
Berks.

Dr. R. A. Bugler,
9, Queen Street,
Cheadle,
Staffs.
(We regret that the incorrect address for Dr. Bugler was published in the June journal).

Dr. H. W. Bunjé,
73, Temple Sheen Road,
London, S.W.14.

Mr. S. H. C. Clarke,
105, The Drive,
Hove 4,
Sussex.

Mr. R. S. Corbett,
149, Harley Street,
W.1.
and
Katrina,
London Road,
Chalfont St. Giles,
Bucks.

Dr. T. W. Newton Dunn,
Deerholt,
Frogham,
Fordingbridge.
Hants.

Dr. C. C. Molloy, Hartwood Lea,
19, Kensington Road,
Chorley,
Lancs.

Dr. G. Stokes,
159, Nimrod Road,
London, S.W.16.

Research At Bart's

DEPARTMENT OF PHYSICS

Teaching

Although the stress in this very progressive department is laid on research, teaching plays an important part in its work. The role of physics in the medical curriculum is clearly becoming important, because of the increasing dependence (for both diagnosis and treatment) on instruments, techniques and on the use of various radiations. For this reason, members of the department believe that "medical" physics should be taught at medical schools, and exemption not obtained earlier. No less important is the training in scientific method, for which physics provides an excellent introduction, and which must clearly be a more important facet of 20th century medical education.

The teaching of the department, however, is not limited to the undergraduate level. Two courses for graduates are already in existence, and more are to be introduced. At present courses are provided for the Diploma in Medical Radiology as well as a course in radiation physics, which includes its biological aspects; the planned Academic Diploma in Radiation Protection will be open to graduates in any subject, including medical students.

Research

(a) *Radiology.* The Research projects are numerous, and because most of them centre around the field of Radiobiology (the effects of radiation on living tissue), much of the work is done in conjunction with other departments. Physicists, chemists, biochemists, cytologists, geneticists, physiologists, pathologists and radiologists are all required in such studies, which range from pure ionic physics and the effects of radiations on simple water, to the examination of their effect on the whole animal, which must be investigated from every angle. For such work a team is required, trained in the relevant aspects of most of the sciences as we know them today, and for this reason Radiobiology must soon become a subject in its own right.

The main tool of research here is the linear accelerator, which delivers a narrow beam of electrons or X-rays, or both, at 15 million volts, and is capable of delivering a dose of 20.000 roentgens in 2 micro-seconds. All these features are important. The narrow beam enables accurate localisation (for example, rats' testes have been irradiated without involvement of the rest of the animal); the high intensity is important so that high doses may be delivered in short periods, thus making possible the investigation of very short-lived radio-active products.

(b) *Physics.* New methods of measuring radiation dosage have been devised which involve only a piece of perspex; they are cheap, quick and reliable, and are now being used by other workers. The absolute determination of energy in the beam is investigated by calorimetric methods.

(c) *Chemistry.* The effect of dose rate on the yield of chemical reactions initiated by radiation is being investigated: the production of radicles with a very short life has for the first time been established.

(d) *Biochemistry.* Work in this field is being done in collaboration with Professor Wormall and the Chester Beattie Institute. The destructive effects of radiation on metabolism, and the inactivation of enzymes, are being studied and also its effects on DNA.

(e) *Cytology.* Together with Dr. Lacy of the Zoology department, the recently acquired Electron Microscope is being used to observe radiation changes at a cellular level, in, for example, irradiated testes of rats.

(f) *Physiology.* Together with Dr. Lindop from the Department of Physiology, the effects of whole-body irradiation of mice are being studied, with particular regard to the ageing process. The results show an increase of rate of the normal processes of ageing. In other words, the animal behaves as though it were older than in fact it is, and the ageing is proportional to the dose of radiation. Survival curves (Fig. 1) illustrate this clearly: the curves for the irradiated mice have the same slope as for the controls, but are displaced to the left. The most important causes of death in mice are neoplasm, leukaemia and degenerative conditions of kidneys and liver: it is interesting to notice that up to a certain dose of irradiation the actual incidence of these diseases is hardly increased, although as explained, the age at which they acquire them is lowered; above

a certain dose, the incidence of malignant diseases actually decreases, possibly because of a certain amount of tissue damage.

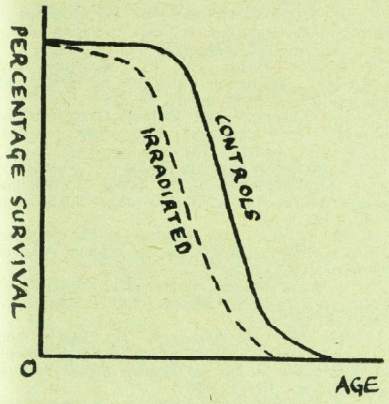


Fig. 1.

The discovery that the effect of irradiation is dependent on the age of the animal is also of the greatest importance (Fig. 2). This affects all work in this subject which was previously carried out without regard to age, and perhaps even more important, may affect dosage in radiotherapeutics.

At present work is in progress to determine whether the long term effects of irradiation, such as a shortening of life, are inherited.

(g) *Clinical Research.* Much of the work of the department is conducted in conjunction with the department of Radiotherapy in the hospital. Radio-isotopes for use in diagnosis and therapeutics are examined; they are also used in the investigation of certain diseases. Thus the thyroids of deaf children are examined; the turnover of iron and chromium in leukaemias and other blood diseases are studied. Isotopes are also used for the investigation of congenital heart lesions (e.g. valvular defects) and have the great advantage that these may be more accurately located than before.

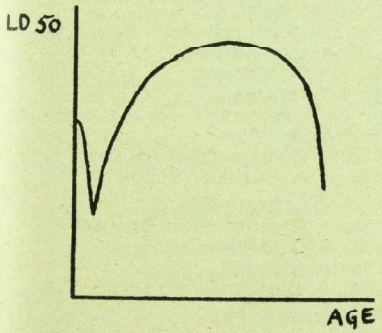


Fig. 2.

The application of radiotherapy is to be expanded. A new department is at present being built on a site across Little Britain. It is to house the linear accelerator and also a new machine for the provision of cobalt irradiation. The great advantage of a high energy radiation is that it can be delivered

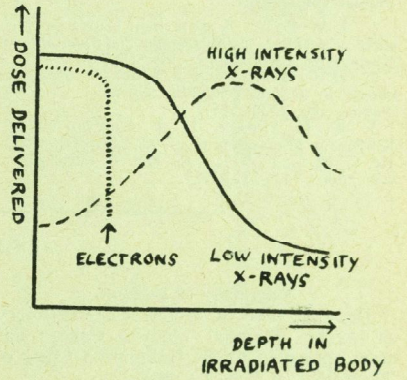


Fig. 3.

inside the body with minimal effect at the surface, which is by contrast with the older methods whose maximum effect is at the surface. Thus a much higher dose can be delivered safely at an internal target than formerly. A further advance in this field is in the delivery of electrons which do not penetrate far, and are therefore most useful for lesions nearer the surface which can be attacked without unnecessary internal damage, (Fig. 3).

Another investigation in the clinical field is into the effects of thorotrast, which was for 30 years used in angiography, until it was realised that it was radio-active, remained in the body, and has even caused cancer. Measurements of radio-activity in tissues

which have been subjected to this substance are made by exposure on to a photographic plate from which can be calculated the courses and energy of the emitted particles.

(h) *Nuclear Physics*. The structure of the atomic nucleus is being studied. Nuclei are bombarded with protons and other fast particles in a cyclotron (at Birmingham) and photographic plates exposed so as to record the energy levels and lifetimes of the nuclei which are the products of the disintegration. The linear accelerator is being used to study the properties of neutrons whose lifetime is of the order of 100 micro-seconds (depending on the medium). It is later intended to extend this field to the examination of biological material.

Selection of recent publications from the Physics Department.

1. J. W. Boag.—A spark light source for high speed absorption spectrography. *2nd International Congress of Photobiology*, 109, 1957.
2. H. C. Sutton and J. Rotblat.—Dose-rate effects in radiation induced chemical reactions. *Nature*, 180, 1332, 1957.
3. W. M. Gibson, D. J. Prowse and J. Rotblat.—The scattering of 9.5 Mev protons by He, C, N, O, F, Ne, A, Kr and Xe nuclei. *Proc. Roy. Soc.*, 243, 237, 1957.
4. J. A. V. Butler, R. H. Pain, A. B. Robins and J. Rotblat.—The relative effects of direct and indirect actions of ionizing radiations on deoxyribonucleic acid. *Proc. Roy. Soc.*, 149, 12, 1958.
5. J. Kirby-Smith and G. W. Dolphin.—Chromosome breakage at high radiation dose-rates. *Nature*, 182, 170, 1958.
6. J. W. Boag, G. W. Dolphin and J. Rotblat.—Radiation dosimetry by transparent plastics. *Radiation Research*, 9, 589, 1958.
7. D. Weitzman and J. McAlister.—Tracer method for localising left to right cardiac shunts. *The Lancet*, 1356, 1958.
8. J. Rotblat and G. Ward. — Autoradiograph measurements of the bones of a radium worker. *British Journal of Radiology*, Supplement 7, 90, 1958.
9. J. Rotblat and others. — The Nuclear Reaction He^4 (a, p) Li^7 and its inverse. *Nuclear Physics*, 5, 141, 1958.
10. J. Rotblat and others.—The scattering of alpha particles by helium. *Proc. Roy Soc.*, 251, 143, 1959.
11. G. W. Dolphin, N. H. Gale and A. L. Bradshaw. Investigations of high energy electron beam for use in therapy. *British Journal of Radiology*, 32, 13, 1959.
12. P. Lindop and J. Rotblat.—Ageing effects of ionizing radiation. *Progress in Nuclear energy*, 2, 58, 1959.
13. M. L. Crosfill, P. Lindop and J. Rotblat.—Variation of sensitivity to ionizing radiation with age. *Nature*, 183, 1729, 1959.
14. J. Bounden and J. Rotblat.—Vacuum in Medicine. Vacuum. 9, 1, 1959.

APPOINTMENTS

University of London.

Dr. J. L. D'Silva, Professor of Physiology at London Hospital Medical College, has been appointed to the Halliburton Chair of Physiology at King's College.

Royal College of Surgeons.

At a meeting of the Council on July 9th, the following elections were made for the ensuing year:

Hunterian Professorship: J. D. Griffiths, R. L. Huckstep.

Erasmus Wilson Demonstratorship: A. G. Stansfeld.

Royal College of Physicians.

The Baly Medal has been awarded to Dr. I. de Burgh Daly.

European Academy of Allergy.

Dr. E. Lipman Cohen has been appointed Secretary of the Sub-Committee on the History of Allergy of the European Academy of Allergy.

Medical Staff

The following appointments to the medical staff take effect from the dates mentioned:

Dental Department
Registrar (part-time)
Miss N. Shotts
Mr. A. Eisenstadt
Out-Patient Assistants
Mr. J. R. C. Cooper
Mr. J. L. Marsden
Mr. W. A. Berwick

Dr. Cullinan's Firm
Senior Registrar (Chief Assistant)
Dr. J. A. Parrish (1/9/59)

Dr. Bodley Scott's Firm
Senior Registrar (Chief Assistant)
Dr. J. Q. Matthias
Junior Registrar
Mr. J. J. Misiewicz (1/11/59)

Dr. Hayward's Firm
Junior Registrar
Mr. P. H. N. Wood (1/11/59)

Department of Pathology
Registrars
Mr. B. A. L. Hurn (1/9/59)
Mr. A. J. Salsbury
Mr. J. S. Murrell (1/10/59)

Department of Anaesthesia
Registrar
Mr. J. P. N. Hicks (12/9/59)
replacing Mr. A. M. Keil

Skin Department
Senior Registrar (Chief Assistant)
Miss A. Scott (1/10/59)

E.N.T. Department
Senior Registrar (Chief Assistant)
Mr. A. Fuller (1/9/59)
Senior Registrar (part-time)
Mr. P. Timmis
Out-Patient Assistant
S. Shere (1/9/59)

Prize-Winners

Matthews Duncan Medal & Prize: Patterson, M. J. L.
Prox. Access: Cantrell, E. G.
Wix Prize: Barton, M. T.
Senior Scholarship in Anatomy, Physiology & Biochemistry: Collins, P., Lewis, M.G., *aeq.*
Herbert Paterson Medal: Cotton, S. G.
Foster Prize: Lewis, M. G., Merry, R. T. G., *aeq.*
Treasurer's Prize: Robertson, A. G.

★ ★ ★

EXAMINATION SUCCESSES

Royal College of Surgeons

The following Candidates were successful in the recent Primary Fellowship Examination of the Royal College of Surgeons in June 1959.

Cameron, A. E. — Poirier, H.
White, H. J. O. — Stainsby, G. D.

The following Candidates were successful in the Primary Fellowship Examination of the Faculty of Anaesthetists in June 1959.

Beard, M. F. — Topham, P. A.
Stevens, J. H. — Hutchinson, R.
Coldrey, P. A.

CONJOINT BOARD

First Examination—June 1959

Pharmacology

Gould, W. A. — Birt, R. C.
Gould, S. E. — Abell, J. D.
Bonner-Morgan, B. M. — Telfer, A. C.
Hare, B. W. E.

CONJOINT BOARD

Final Examination—July 1959

Pathology

Cox, T. A. R. — Robinson, J. S.
Hudson, M. J. K. — Roles, W.
Gould, W. A.

Medicine

Thomson, R. G. N. — Plant, J. C. D.
Tooby, D. J.

Midwifery

Thomson, R. G. N. — Dobson, J. L. C.
Alabi, G. O. — Bonner-Morgan, R. P.

The following have completed the examinations for the Diploma:

Dobson, J. L. C. — Gould, A. M.
Sugden, K. J. — Warrander, A.
Bonner-Morgan, R. P.

Surgery

Dobson, J. L. C. — John, R. W.
Gould, A. M. — Townsend, J.
Warrander, A. — Alabi, G. O.
Bonner-Morgan, R. P. — Sugden, K. J.

UNIVERSITY OF LONDON

Special Second Examination for Medical Degrees, July 1959

Balfour, A. J. — Marsh, A. R.
Britz, M. — Robinson, L.
Colin-Jones, D. G. — Sandhu, M. S.
Ducker, P. S. — Stevenson, M. C.
Harcup, T. J. O. — Watkin, B. C.
Hutchinson, D. B. A. — Blake-James, R. B.
Joy, P. J. — Butler, P. W. P.
Perry, P. M. — Davies, R. K.
Smyth, N. W. — Guest, A. D. L.
Turner, G. M. — Howell, F. A.
Rushman, G. B. — Iregbulem, L. M.
Bergel, R. C. — Patrick, P. L.
Brodribb, A. S. — Shearer, R. J.
Dacie, J. E. — Ross, A. P. J.
Fonseka, Y. — Terry, A.
Healey, J. — Wilson, A. I.
Ind, J. E.

Special First Examination for Medical Degrees, July 1959

Bressler, A. — Shearman, J. K.
Letchworth, A. T. — Haig, G.
Philps, J. F. — Phillips, M.
Groves, R. J. — Tucker, A. K.
Percival, G. M.

The following General Certificate of Education Candidates have qualified for exemption from the First Medical.

Anderson, J. S. — Gilkes, J. J. H.
Frears, C. C. — Harrison, J. R.
Hillier, E. R. — Moss, M. S.
Williams, M. — Casewell, M. W.
Bond, J. V. — Salisbury, N. S.

UNIVERSITY OF OXFORD

2nd B.M. Examination—Trinity Term 1959

Pharmacology & Principles of Therapeutics

Busfield, H. M. B.

Medicine

Ellis, R. P. Branfoot, A. C.
Fuge, C. A Lyon, D. C.

Surgery

Branfoot, A. C. Ellis, R. P.
Lyon, D. C. Fuge, C. A.

Midwifery

Branfoot, A. C. Fuge, C. A.
Ellis, R. P.

The following completed the examination for the degree **B.M., B.Ch.**

Branfoot, A. C. Fuge, C. A.
Ellis, R P.

UNIVERSITY OF CAMBRIDGE

Final M. B. Examination—Easter Term 1959
Part I: Pathology & Pharmacology

Boston, F. M. Church, R. B.
Hobday, G. R. Gabriel, R. W.

Part II: Medicine

Abercrombie, G. F. Lee, B. K.
Drinkwater, P. Parkes, J. D.
Gabriel, R. W. Strang, F. A.
Hobday, G. R. Dick, D. H.
Jephcott, C. J. A. Evans, G. H.
Maurice-Smith, N. J. Hindson, T. C.
Richards, D. A. Hurding, R. F.
Bowles, K. R. Mather, J. S.
Duff, T. B. Perkins, B. A. W.
Godwin, D. Williamson, C. J. F. L.
Hobday, J. D.

Part II: Surgery

Abercrombie, G. F. Hindson, T. C.
Duff, T. B. Jephcott, C. J. A.
Haslam, M. T. Perkins, B. A. W.
Hurding, R. F. Williamson, C. J. F. L.
Parkes, J. D. Drinkwater, P
Tooth, J. S. H. Hamilton, S. G. I.
Dick, D. H. Hobday, J. D.
Gabriel, R. W. Mather, J. S.
Strang, F. A.

Part II: Midwifery

Abercrombie, G. F. Hobday, J. D.
Church, R. B. Mather, J. S.
Duff, T. B. Perkins, B. A. W.
Godwin, D. Williamson, C. J. F. L.
Hindson, T. C. Cantrell, E. G.
Jephcott, C. J. A. Drinkwater, P.
Parkes, J. D. Faber, V. C.
Strang, F. A. Gabriel, R. W.
Bowles, K. R. Hurding, R. F.
Dick, D. H. Maurice-Smith, N. J.
Evans, G. H. Richards, D. A.
Hamilton, S. G. I.

The following completed the examinations for the degree **M.B., B.Chir.:**

Abercrombie, G. F. Jephcott, C. J. A.
Duff, T. B. Perkins, B. A. W.
Haslam, M. T. Williamson, C. J. F. L.
Hurding, R. F. Drinkwater, P.
Parkes, J. D. Gabriel, R. W.
Tooth, J. S. H. Hobday, J. D.
Dick, D. H. Mather, J. S.
Faber, V. C. Strang, F. A.
Hindson, T. C.

"BART'S JOURNAL"

The Journal's cover now displays
An excellent design:
Its readers all approve and praise
Its most attractive line.

They notice also how the hue
Each month is subtly changed,
And how appropriately too
The colours are arranged:

Blue, white, grey, yellow, brown or green,
The monthly parts appear,
Symbolic of the changing scene
Throughout the changing year.

Kaleidoscopically bound
They mark the season's flight:
In January, like the ground,
The cover's snowy white.

In April green brings gay relief,
The halcyon blue for May,
October's sere or yellow leaf,
November's brown or grey.

But now, it seems, we must prepare
To flout the almanac—
The Printers' Union may declare
September's number black!

R.B.P.

Dysphagia Lusoria

by R. L. ROTHWELL JACKSON
(*House-Surgeon*)

Lusoria, (Latin lusus: a trick or joke) may seem a strange adjective to use, in naming a difficulty in swallowing due to the pressure on the oesophagus by an aberrant artery. It was Bayford [1] (1794), who first coined the term dysphagia lusoria.

He described a case of a woman aged 62, who eventually died of emaciation following dysphagia of increasing severity. At post mortem, he found an abnormal right subclavian artery arising from the left side of the aortic arch and passing between the trachea and oesophagus, compressing the latter as it crossed to the right side of the thorax. Bayford described this as "lusus naturae" or a trick of nature, thus giving origin to the term dysphagia lusoria, a strange mixture of greek and latin derivations.

Although classical dysphagia lusoria is due to an abnormal right subclavian artery; the term is now used to describe dysphagia confined to the upper third of the oesophagus, and caused by an aberrant great vessel i.e. the aortic arch or its branches due to abnormalities of development.

Embryology

At the beginning of somite formation, paired dorsal tubular vessels are found one on each side of the notocord. At the cephalic end of the embryo the dorsal vessels continue round the sides of the pharynx forming the curved first arch arteries, which in turn connect with paired ventral tubes, which fuse to form the single endothelial heart tube. Five other arch arteries are formed, connecting the ventral and dorsal aortae. Caudally, at about the third week, the paired dorsal aortae fuse to form a single definative descending aorta.

During further development, some of the arch arteries disappear and some persist to form definative vessels. The arterial side of the circulation becomes predominantly left-sided so that the left dorsal aorta persists helping to form the left-sided aortic arch. The first two arch arteries disappear. The third arch arteries persist forming the common carotid at their ventral ends, the dorsal ends joining the dorsal aortae which extend forwards beyond the first arch, to form the internal carotid arteries on each side. The fourth arch arteries persist and increase in size forming on the right side the root of the right subclavian artery and on the left side the arch of the aorta. The fifth arch arteries are only transitory. The sixth arch arteries persist as the roots of the pulmonary arteries, but their connection with the dorsal aorta persists on the left side only as the ductus arteriosus.

The definative vascular pattern (Fig. 1) is completed by the disappearance on both sides of the dorsal aortae between the third and fourth arch arteries, and the disappearance of the right dorsal aorta below the fourth arch artery. The left subclavian arises by hypertrophy of a segmental branch of the left dorsal aorta. The bulbus cordis becomes divided into an aortic and pulmonary trunk by the development of a spiral septum.

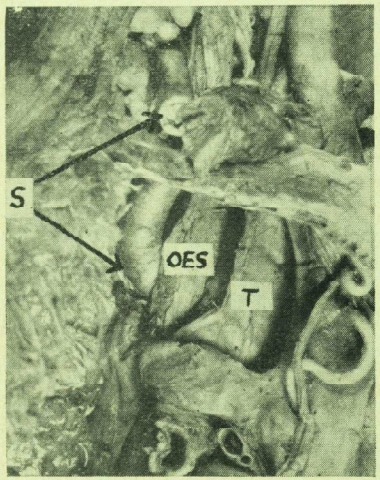
The aberrent vessels causing dysphagia lusoria arise as a result of departure from the above normal pattern of development, and can be considered in three groups.

A. Abnormalities associated with a left aortic arch.

The commonest of these is the abnormal origin of the root of the right subclavian artery from the arch of the aorta as its fourth branch. It occurs in about 1% of dissected specimens [2] and the photograph shows a dissection of one such case. This abnormality is due to failure of the right fourth arch to form the root of the right subclavian artery, which latter is formed by the persistance of the right dorsal aorta and passes usually behind, and sometimes in front of the oesophagus. The fourth arch may, as in the dissected specimen, persist as the origin of the right vertebral artery from the right common carotid (Fig. 2). The abnormality may be associated with abnormalities of the thoracic duct, but, in the specimen dissected, both the thoracic and right lymphatic ducts emptied normally into the angle between the internal jugular and subclavian veins.

Bayford's case showed the subclavian artery passing between the oesopahgus and trachea. An earlier case (1735) was reported by Hunand [3] where the artery passed behind the oesophagus. Holzapfell [4] analysing this abnormality found 107 instances of

the artery passing behind the oesophagus; 20 where it passed between the oesophagus and trachea and 6 where it passed in front of the trachea. The right recurrent laryngeal nerve no longer hooks round the subclavian artery, but passes direct to the larynx at the level of the cricoid, or hooks round the first part of the vertebral artery if this arises from the carotid [4] It is difficult to explain the occurrence of those cases (e.g. Bayford's), in which the abnormal subclavian artery passes between the oesophagus and trachea. Presumably an aberrant vessel in this position becomes hypertrophied and gains a connection with the right dorsal aorta, and later becomes the definative artery.



Showing the aberrant subclavian artery (S)
(*OES-Oesophagus; T-Trachea*)

B. Abnormalities associated with a right aortic arch.

This is the normal pattern in birds, and must be distinguished from transposition of the great vessels (Dextrocardia). A right aortic arch may be of two types. The anterior type of right aortic arch passes anterior to the trachea, over the right bronchus and then descends on the right side of the oesophagus. The posterior type of arch passes over the right bronchus and then deviates to the left behind the oesophagus, becoming descending aorta slightly to the right of the normal position. Constriction of the oesophagus is especially likely if the right arch is tethered by

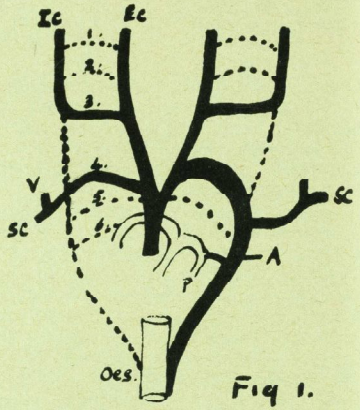


Fig 1.

IC—Internal Carotid EC—External Carotid
SC—Subclavian V—Vertebral
Oes—Oesophagus P—Pulmonary

the attachment to it of the ligamentum arteriosum forming a compression ring. (Fig. 3.) In the majority of cases of right aortic arch, there is a further abnormality in the origin of the left subclavian artery,[5] which arises as its fourth branch and passes behind the oesophagus in the same way as the aberrant right subclavian artery (Fig. 4). The ligamentum arteriosum may join this abnormal left subclavian artery forming a compression ring.

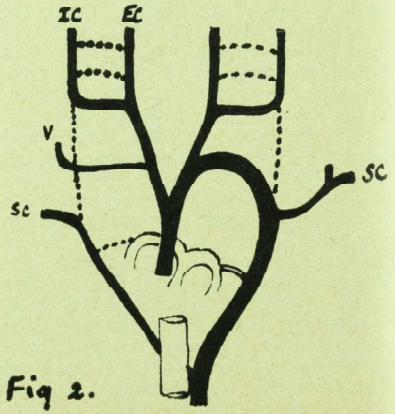


Fig 2.

C. A double aortic arch

This is the normal pattern in reptiles, and is due to the persistance of both dorsal aortae forming a vascular constriction ring, compressing both the trachea and oesophagus (Fig. 5). It is rare in man. The left arch passes anterior to the trachea, and the right arch passes posterior to the oesophagus, and they unite posteriorly. One arch may atrophy, and the left (anterior) is usually smaller than the right (posterior).

Symptoms

The vessel abnormalities described, may be present without causing any symptoms and are then diagnosed by chance post mortem, or during X-ray examination.

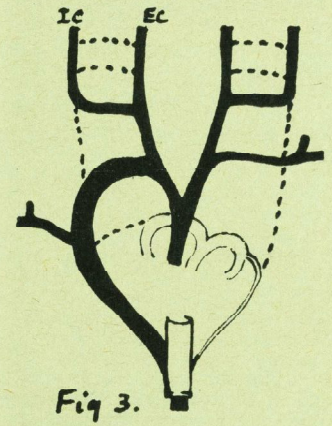


Fig 3.

Symptoms occur in two age groups. Firstly in infancy and early childhood, when the symptoms may resolve spontaneously after 12 months as the vessels become elongated. Secondly, symptoms occur in late middle age, when hardening of the arteries makes them more rigid.

A vascular compression ring is likely to constrict the trachea as well as the oesophagus, and respiratory symptoms of stridor and persistant cough may overshadow the dysphagia. Such symptoms are most common in the first group. Dysphagia is usually first noted when the child is being weaned on to solid food and may be associated with vomiting.

In adults, dysphagia is the usual symptom and may be slight and intermittent, or persistant and severe, causing emaciation, though such severity is rare.

Asherson [6, 7] has recorded three cases

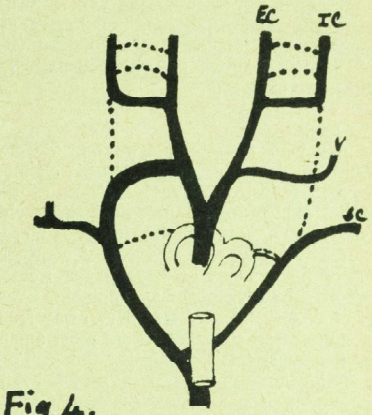


Fig 4.

with symptoms present in infancy and childhood. All had respiratory symptoms as well as dysphagia, due to a double aortic arch in two cases, and a right aortic arch with anomalous left subclavian artery in the third. Doulton [8] has also reported a case of double aortic arch in a child of 2 years with respiratory and dysphagic symptoms.

Diagnosis

The condition may be suspected from the history. In infants the condition should

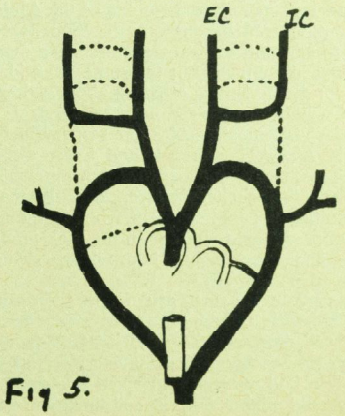


Fig 5.

always be looked for,[6] when investigations have excluded other causes of dysphagia (e.g. oesophageal stenosis), and other causes of stridor (e.g. thymic enlargement). Endoscopic and X-ray examination with contrast media will confirm the compression of the oesophagus or trachea by the aberrant vessels. Identification of the vessel usually requires an angiogram.

Treatment

Cases with only mild symptoms do not require surgical intervention. Gross[9] claimed the first reported surgical division of the anterior segment of a double aortic arch with relief of symptoms in an infant. Later[10] Gross et Al. reported 40 cases of compression of the trachea or oesophagus treated surgically by division of an anomalous vessel, or displacement of an artery away from the compressed structure. Cases most amenable to surgery are; right aortic arch anchored by the ligamentum arteriosum; double aortic arch; and aberrant subclavian artery.

Finally it should be stressed that the vessel abnormalities described do not occur uncommonly, but though of interest as "lusus naturae", they usually cause only minimal disability. Rarely, however, especially in cases of double aortic arch or other compression ring in infants, respiratory symptoms and dysphagia may result from compression of the trachea and oesophagus. It is usually the former which endangers life and requires urgent surgical intervention.

I wish to express my gratitude to Professor Boyd for his advice in preparing this paper, also to the photographic department of the Cambridge Anatomy School for the photograph.

References

1. Bayford, D. 1789. Mem. Med. Soc. Lond., **2,** 271.
2. McDonald & Anson. Quoted in Grant. *Atlas of Anat.* 2nd edit., **324.**
3. Hunard. 1735. Cited by Gross et Al. *Surg. Gynec. Obstet.*, **83,** 435.
4. Holzapfell. 1899. *Anat. Hefte.*, **12,** 369.
5. *Quains Anat.* Vol II. Part II. 10th edit., **385-387.**
6. Asherson. 1952. *Journal Laryng. & Otol.*, **66,** 111-131.
7. Asherson. 1953. *Ibid.*, **67,** 172-174.
8. Doulton & Everley-Jones. 1952. *Lancet*, March 15th, **537.**
9. Gross, R. E. 1945. New Eng. J. Med., **233,** 586.
10. Gross, R. E. & Neuhauser, E. B. 1951. *Pediatrics*, **7,** 69.

The High Level Route

From Chamonix to Sass Fee on Ski

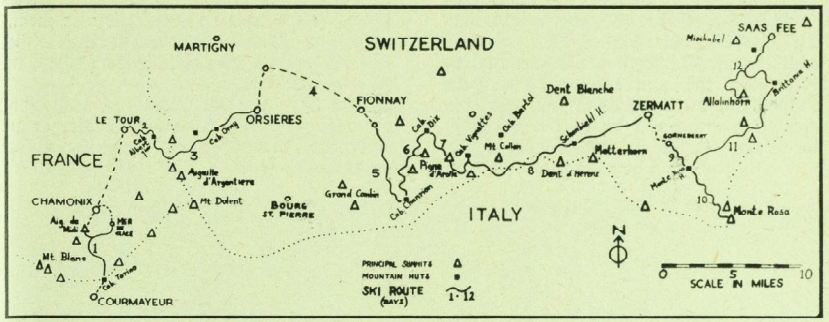
by M. Birnstingl

(*Senior Registrar*)

A traverse of the glaciers between Chamonix and Zermatt has been a classical mountaineering route since members of the Alpine Club pioneered the crossing in 1863. Needless to say, the earliest traverses were made on foot in summer, but the route is an ideal one for alpine skiing, crossing about a dozen passes between 10,000 and 12,500 feet in some of the most spectacular scenery in the whole Alps. The French and Swiss alpine clubs have now built several huts in which one can find shelter or sleep, and the main difficulties of completing the whole route are the unpredictable weather in the high mountains and the weight of provisions which have to be carried.

We made our first attempt in the spring of 1958 with a party of four in which Bart's was well represented by Adrian Griffith and Hugh Bower. Soon after leaving Zermatt we ran into bad weather and spent two exceedingly cold nights, imprisoned in the Bertol hut; when the blizzard at last stopped, we skied down to Arolla and abandoned the route. This year, however, perhaps chastened or challenged by our previous defeat and helped by better weather, Bower was successful in getting through in March and we came over in late May. There were three of us in the party, an ideal size for this type of venture, and with two doctors and a bassoonist (without bassoon) we had hopes of being able to cope with almost any contingency!

The first few nights were spent in the Torino hut above Courmayeur, trying to get up our strength by skiing down to Chamonix each day and returning in the evening by the Aiguille du Midi telepherique. It was on one of these practice runs one morning, that I managed to fall over whilst coming down through the seracs of the Glacier du Géant. Fortunately I ended up by sliding across the top of an open crevasse and not into it, but it was a near thing and seemed a sobering



Sketch Map of the High Level Route, 1959

The Sections shown as a series of dashes were bus or train and the numbers show successive days

moment. Nevertheless the only remark of a German skier who was coming after me was: "Ein Herr hatte heir falste im Spalten gefallen" (a chap here has almost fallen down a crevasse), before he and his companion departed down the glacier with true Teutonic phlegm, leaving me to extricate myself. Despite this and similar excitements, a few days later we set off on the high level route, the ski piled on top of our bulging rucksacs looking somewhat incongruous as we trudged up through the flower-scattered pastures of the Chamonix valley, with not a patch of snow in sight. We soon began to wonder, as the heat of the sun gradually increased, whether the atomic age had removed the alpine snows and that we were committed to a holiday of endless clambering over relentless rock and scree, bent under about forty pounds of food and equipment. But late that evening we found the snow, when we reached the Cabane Albert Premier, our first hut; and most of the route we followed later was on well-covered glaciers, above the summer snow-line.

Most days we were up and away by 4 a.m., to finish the main glacier crossings before the heat of the sun had softened the frozen snow, making progress difficult and the snow bridges over the crevasses unsafe. If we did not get badly lost, we usually arrived at the next hut in the early part of the afternoon, leaving ample time for sleep, repairing equipment and for the detailed planning of next day's route. Most climbing was with skins under the ski, but on particularly steep or awkward slopes, the ski had to be carried on the rucksacs. Ice axes were also strapped on our packs, where they were least likely to injure the owner during the inevitable falls, but were still accessible when needed. A practical detail is that we used fairly short, pliable skis and avoided any type of "release binding", since these are quite unsuitable for this sort of skiing.

Although the glaciers of the high route are very crevassed, we made all our descents without the rope. Whatever the theoretical advantages of skiing roped, we have never been able to manage this without the last man being cracked like a whip every time the leader makes a turn. After careful reconnoitring, provided each skier follows closely the track left by the first man, an unroped descent is moderately safe as long as snow conditions and visibility are good; most experienced parties use this technique. Our worst weather came when we were at a comparatively low altitude, walking up the gloomy Val de Bagnes towards the Chanrion hut. Part of this valley is filled by an enormous hydro-electric barrage, and the new footpath passes through a long series of galleries which have been cut high up in the cliffs above the artificial lake. As we entered this tunnel we passed a solitary road-mender, who shook his head doubtfully when we told him we were making for the head of the valley. He warned us that we might be bombarded with "cailloux" from the cliffs above, as our path finally emerged from the galleries. We were not at all sure of the translation of this sinister-sounding word and our misgivings increased when we began to negotiate the galleries, which were almost dark in some places; in others we had to crawl on all

fours between the dripping roof of the tunnel and piles of frozen snow which had blown in during the winter. However, we eventually emerged from inside the mountain into the rain and the road man was right in that the track was littered with recently fallen rocks and boulders. Although none of these "caillioux" was much bigger than a Morris minor, we felt that this was not the time or place for resting. For the next half hour we covered the ground as quickly as possible, wondering between anxious upward glances whether the whistle would be heard before the rock hit us, or whether it might be the other way round!

The Chanrion hut lies close to the Italian frontier in a desolate and forsaken valley, so that it has the reputation of being used more often by smugglers of tobacco than climbers. But we had the place to ourselves. The high level terrain is so vast that although we met a few other parties during our travels, this was unusual, and on several days the only creatures we saw on the glaciers were occasional ravens and alpine choughs. The huts are exceedingly cold early in the year at these great heights and we generally hoped to find them empty so that there would be plenty of blankets to spare at night; it also meant that we were unlikely to be disturbed, whilst cooking our long awaited evening meal on the wood stove.

Next day we left Chanrion in brilliant weather and crossed two steep passes to the next valley, dumping our packs for a few hours to go up Mont Blanc de Cheilon. We did not climb beyond the south peak, because of a shaky-looking cornice on the ridge to the higher summit and skied down to the Cabane des Dix. We pushed open the door to find signs of recent feasting, because we had disturbed the solitude of three wealthy and very genial Swiss. They had brought with them enough food and drink to combat their austere surroundings for a week of alpine skiing. But what interested us more was that they had enlisted the skill of Herr Geiger, who had flown each of them in turn from Sion in the Rhone Valley, landing his little Piper Cub aircraft on the glacier near the hut. Having spent five days carrying our humps over the mountains, we must have seemed to these more enterprising Swiss like dejected, two-legged alpine dromedaries.

The Aiguilles Rouges d'Arolla

Pigne d'Arolla is one of the few high mountains whose summit can be reached in the spring, without taking off the ski for the final climb. It is approached from Dix by climbing two steep glaciers distinguished by the names of Tsena Réfien and Tsidjiore Nouve, so that we may be forgiven for spending an extra hour putting in some practice near the summit, with a splendid view at our feet over the snow peaks of three countries. This led to a late start down the glaciers on the opposite side, by which time the clouds had come down. We were soon completely lost and paid the penalty for dallying by an anxious descent, having to make frequent use of the pocket altimeter, the compass and the map before we eventually found the Cabane des Vignettes. Our past troubles were forgotten a little later, because the clouds suddenly cleared and the hut is in an unequalled situation, high above the Arolla valley. This region, the centre of the high level route, is probably the finest in the Alps. There is a wonderful remoteness in its vast glaciers and the high peaks have a classical symmetry almost like those in a children's picture book and contrasting with the rocky spires of the Chamonix massif. Should one be forced down into the Arolla valley by bad weather, the women are to be seen working in the fields in a picturesque costume and the roofs of the chalets are of shingles, a pleasant change from the corrugated sheeting which despoils so many Swiss villages. It is difficult for a visitor to forget an evening over a bowl of "fondue", a traditional celebration of these valleys, concocted of melted cheese with wine and spice. After washing down some pounds of this mixture with the local wine, it is rare indeed for a group of climbers to be in fit condition to walk up to their hut next day. Because of a previous experience of this sort, we stayed up in the Vignettes hut to prepare for the next stage, the long traverse to the Schonbiehlutte and Zermatt. It promised to be the most difficult passage, since none of us had been over the terrain before and the route passed over three very high passes, the Cols de l'Evêque, Mont Brulé and Valpelline, before reaching the top of the lengthy descent on the Zermatt side. Once fairly embarked on these glaciers, it would be difficult to escape if the weather suddenly changed, and the sentence in the guide book: "C'est une étape excessivement longue, qui ne doit être pas tentée sauf les conditions absoluement sûres" seemed anything but reassuring. We munched our risotto in silence, but next morning with a 3 a.m. start were lucky to find excellent snow and weather and we made good progress. It was a day to remember. Starting out by starlight from the hut, we skied slowly across the silent desert of the glacier, passing close under the steep ice of Petit Mont Collon. Finally, fumbling with our frozen bindings on the Col de l'Evêque, the pink sunrise began to creep down the rocks high above us, turning the cold shadow of the night into brilliant, sparkling light. We crossed over to the Italian side of the range, then back into Switzerland and again to the Italian side before reaching the Col de Valpelline, but the magnificence of the surroundings made us forget the discomforts of the long traverse and in a few more hours we were swishing down the Stockjigletscher, watched by the great north faces of the Dent d'Hérens and the Matterhorn. The snow ended as we came off the tongue of the glacier and we had to carry our ski and begin a long clamber over the hot, dusty boulders of the moraine. Each of us had started the day wearing two heavy wool sweaters, thick shirts, string vests and anoraks but by the time we trudged into Zermatt in the afternoon, our rucksacs were festooned with these clothes.

In Zermatt one of the party had to leave: my cousin, Bryan-Brown, hurried off to catch a train towards the start of the week and a new house-job. My brother and I had much-needed baths and washed and dried our (only) shirts from the hotel window. After the luxury of a bed with sheets, we were soon off on the rack railway to the Gornergrat and walking over to the Monte Rosa hut. From this base we climbed Signalkuppe, one of the Monte Rosa summits; this is the second highest mountain in the Alps, but we had little inclination to admire the view. Our damp boots had frozen solid and a bitterly cold wind made us hurry off the summit rocks. We then had a wonderful run down the Monte Rosa glaciers, which brought us whooping and yodelling from an altitude of a few feet under 15,000 to the hut at 10,800. An inch of powder snow over a frozen base makes the most splendid of ski descents.

The final lap to the Brittaniahutte was another long day. We had some trouble with the snow bridges on the Findelen glacier and when we finally got over the Adler Pass we were in thick cloud and it was snowing. This made the descent on the Saas side very unpleasant and the visibility became so poor

that we felt as if we were skiing with pillow-cases over our heads. Neither of us had seen the glacier before and we had to rely again on the map to find a route between the ice-falls, where the glacier, dropping more steeply, became broken into enormous cliffs of blue ice. However, we consoled ourselves with the knowledge that the Swiss "Carte nationale 1:50,000" is a production of outstanding accuracy, so that if we fell into a crevasse, the fault would be ours and not that of these most beautiful of maps.

On the last day, the two of us climbed Allalinhorn (13,200 ft.) and basked for an hour on a windless summit before skiing down to Saas Fee. We could see, amongst the receding ranges of rock, snow and ice,

(*concluded on p. 249*)

LETTERS TO THE EDITOR

Dear Sir,

What is in a name? This was the title of a newspaper article a few weeks ago—no doubt, as Editor, this question has also passed through your mind.

The strange notions that may be conjured up by the name Cholmondley or Nuffield; Brown or Smith, are perhaps of opulence or benevolence; humbleness or simplicity. These are just examples of a peculiar trait in human beings to prejudge a neighbour's character by their name.

What is in the name? I will take this opportunity to say that there is, in the name of Jesus, the solution to the world's problems at large and those of each individual.

Details are being given to each student concerning the L.I.F.C.U. triennial Mission, which is supported by our Hospital Christian Union. Dr. Martin Lloyd-Jones will be giving the main addresses at All Soul's, Langham Place, from November 10th-17th.

I would ask those who have never considered the use of the name Jesus Christ in any but a swearing capacity to go and hear it being used correctly as a means of help and love; to those who already know this—please go along and help the many who are not so lucky.

That there is a lot in the name of Jesus is an understatement—this might be your last, or first, chance. Christianity is not easy but it is worthy of your serious consideration.

Yours sincerely,
B. J. STOODLEY,
President, Christian Union.

Dear Sir,

I read with interest your Editorial on the problem of euthanasia applied to hopeless children. It seems, however, that you have omitted one aspect which is a very real problem: that is, what constitutes a human life? Whilst I fully agree with the sanctity of human life, and with the moral obligations resulting from such a principle, yet it seems to me that the main problem is finding criteria from which to assess the nature of the creature in question.

Some of these children, from the moment they are born until their death, show no signs of those faculties by which one differentiates man, with his immortal soul and superior intelligence, from other forms of life. Incapable of moving about, totally unaware of their surroundings (or in some cases, aware, but uncomprehending), they are cared for throughout life, by dedicated people performing thankless work. No one could deny the heart-rending character of this work, but perhaps one would have to have tried it, to fully understand the perplexing nature of the problem as to whether these creatures are human or not; of whether this is really dedicated service to the less fortunate children (and their parents), or whether it is a total waste of time, energy and money, caring for creatures of apparently less value than domestic animal or family pet.

There are problems for the bacteriologists and virologists in distinguishing between "living" and "non-living"; but there are even more momentous problems for the clinician in deciding between "human" and "non-human". Where does one draw the line?

Yours sincerely,
"PERPLEXED"
St. Bartholomew's Hospital Medical College.

Dear Sir,

I fully agree with the ideas put forward in your July Editorial. However, I should like to add something on one of the points to which you referred briefly. The value of life to oneself and to the community is, as you suggest, sufficiently sacred to most sane people to prevent the taking of life for any purpose.

It is only when this usefulness is lost for ever (or, in the case of these children which you instanced, appears never to have been present), that it occurs to people to dispose of such beings. But surely the main reason for this is not only one of convenience, though I think the burden which such helpless people place on their relatives and the community is often considered as much as the suffering of the victim, when there is talk of enthanasia. More likely is it that people in this materialist world are deaf to the teachings of the Christian Church. From Divine Revelation we learn that the function of our life on earth is to love and serve God, thus fulfilling one of the main purposes of our creation. Who are we to assume to judge whether or not a soul, even in the most deformed and deficient of bodies, is capable of knowing and loving God, even if active service (in the human sense) appears impossible? It can surely never be wrong for the doctor to prolong human life, but it may well be wrong for him to take it. As long as there is any doubt (and since we as humans cannot know God's purposes, there will always be doubt), life must be held sacred. To cut short a life on earth (the time given by God to man to work out his salvation) is thus a crime for which we should have to answer before the Creator of that life and of our own.

Yours sincerely,
E. KNIGHT.

BOOK REVIEWS

RADIOISOTOPE TECHNIQUES IN CLINICAL RESEARCH AND DIAGNOSIS, by N. Veall and H. Vetter Butterworth & Co. Ltd., London. P. xii and 417. Price 50s.

This book is intended primarily for the clinical worker, who is concerned with the management of patients, and who is interested in using radio-isotope methods either as a diagnostic or a research tool. The first half of the book is concerned mainly with the fundamental physics of radio-activity and the methods of measurement of ionising radiations. A simple account is given of the various types of radiation detectors and the associated electronic equipment; this leads on to details of various radioactive measuring techniques. There is a useful chapter on radiation hazards, which gives a general background of the subject, and then proceeds to practical suggestions about handling of radioactive isotopes and the protection of staff. The question of radiation dosimetry is dealt with briefly.

The second half of the book deals mainly with various clinical applications, each chapter dealing with one particular problem in detail: the techniques developed, the interpretation of results, and the possible sources of error. These chapters give a good idea of the diversity of problems which have been investigated using radio-isotopes. They should serve as a useful guide on established techniques, and stimulate ideas on fresh fields of exploration.

For the sake of completeness there is a chapter on Isotope Therapy, which in the space of ten pages, gives a brief outline of the subject.

This is a book which is easily read, and which gives a comprehensive, and simple, account of the subject. The use of mathematics has been kept to a minimum, and the subject matter can be followed even if the mathematics are not understood. The bibliograhy, while not exhaustive, is good. Clinical workers should find this book a helpful guide to the use of radioactive isotopes, even those with little knowledge of physics should find it encouraging. It provides a good introduction to the subject for medical students, who may read it without bothering too much about the detail. Even those who are already in this field may find something of value in the second half of this book.

J. McAlister.

A CONCISE TEXTBOOK FOR MIDWIVES by Douglas G. Wilson Clyne. Publishers: Faber & Faber Ltd. Price 32s. 6d.

Mr. Wilson Clyne's book does in part accomplish its stated purpose, for it gives insight into the type of question asked in the examinations of the Central Midwives Board and shows how they may be answered. It is concise in presentation and would serve well as a book from which to revise, but one would hesitate to recommend it as a text-book for sole study; and it is certainly unsuitable for reference or wider reading, while its price limits its use as an adjunct. The form is essentially question and answer and therefore the text is inevitably somewhat disjointed and not always self explanatory.

The anatomical section is brief and no space is given at all to the development and embedding of the ovum or to placental development, although on page 102 both the decidua vera and decidua capsularis are mentioned with no explanation at all, and the anatomy of the Fallopian tube appears much later in connection with bleeding in pregnancy. The section devoted to labour is the best; the diagrams are clear and the mechanism well presented and simple, although one is left wondering if right occipito-anterior and left occipito-posterior positions of the vertex do ever occur. Lövsets' manoeuvre is worthy of inclusion but the description is too brief to be of real value. Ante-natal care is well described, but the reasons for history taking not elucidated. The puerperal care is rather brief and "the midwife scrubs up for the usual 7 minutes" (page 207), for perineal toilet, is unrealistic. Section V on The Infant is devoted mainly to the recognition of the abnormal, and in many instances the rare conditions precede the common ones. More practical details of simple nursing care of the full term and premature infant could have been given with benefit.

Diagrams are clear and pleasing with the exception of those on page 234 (Foetal Abnormalities), which are rather distasteful and exaggerated. Some are not well linked with the explanatory text such as those showing manoeuvres used in abdominal palpitation (page 75) where no explanation is offered and the discomfort of Pawlik's grip not pointed out.

The whole is a little pedantic and conservative, particularly in terminology, older classifications of placenta praevia and pituitary hormones being used. Nevertheless this book will certainly be welcomed by many pupil midwives as a quick and easy means of revision and a way of accustoming themselves to the type of question they may encounter.

Miss R. E. Bailey,
Midwife Teacher's Diploma

ELEMENTARY MEDICAL THERAPEUTICS by G. F. Walker. Published by John Wright & Sons, p. 69. Price 7s. 6d.

This book is based on the principle that it is better to know a few drugs well than a large number vaguely. Designed for use by senior students and housemen, it sets out under simple headings such as "Analgesics", "Diuretics", "Muscle Relaxants", etc., a selection of the most useful drugs and preparations available.

POCKET BOOK OF PROPRIETARY DRUGS by Cruikshank and Stewart. Published by E. & S. Livingstone, p. 236. Price 10s. 6d.

This slim volume, which fits readily into the pocket, sets out the names, manufacturers, compositions, indications, packs and dosages of some fifteen hundred drugs, ranged in alphabetical order. For those who know the name of a preparation and require such additional information this is undoubtedly a useful book.

THE LIFE AND WORKS OF JOHN SNOW

The Wix Prize Essay, 1959

by M. T. BARTON

PART 1 : EARLY YEARS AND THE EPIDEMIOLOGY OF CHOLERA

It is the fate of many great men to be neglected by their fellows, only to receive praise and recognition from succeeding generations. The name of John Snow is respected to this day, a century after his death, because of the greatness of his work in two quite distinct fields of medical science. His classical researches into the epidemiology of cholera earned him the respect of his associates, but the general medical opinion of his day called his work "Dr. Snow's Theory" and considered it no more probable than many of the vast body of conflicting views that represented the teaching on that terrible disease. It was left to posterity to recognise that his was a model of scientific inquiry that has the permanence of a masterpiece.

If he was neglected for his work on cholera, he won the unstinted admiration of his contemporaries for his ability and teaching in the field of anaesthesia. Entering on it when it was but in its infancy, he made the subject his own. He found it in the hands of empiricism and by his example and his researches he left it an exact science. He was founder of the tradition of English anaesthesia, a practice that now stands so high in the world.

He was a man of the highest integrity, of unending determination and unbending conviction, when this conviction was founded on facts. His work was painstaking, meticulous and as exact as he could make it, yet he had a mind great enough to cleave through the welter of detail and arrive at great conclusions. In his life he deserves our admiration for his struggle against adversity. In his work he deserves nothing but praise.

The early years

John Snow was born on 15th March 1813, the eldest of the seven children of William Snow, farmer and carter, who lived near York. During his first twenty years, Snow gave many signs of that singleness of purpose which was to characterise his attitude to life. He showed ability during his schooling and after what was probably a stern childhood, he began his medical career at the age of fourteen, apprenticed to a surgeon in Newcastle. Whilst at Newcastle, where he was one of the first pupils of the new Medical School, he became a rigid vegetarian and a firm believer in total abstinence. A vegetarian he remained for eight years and only at the end of his life did he relax his rule about alcohol. To any patient whom Snow thought was not ill, he gave a blunt opinion and sent him packing, to the chagrin of the surgeon who saw many a paying patient disappear under Snow's determined treatment. During this time Snow first saw cholera in all its grim reality, when he treated the miners of Killingworth Colliery during the epidemic of 1832.

When, after nine years in the north as assistant to various surgeons, Snow set out for London, he chose to walk, visiting Liverpool, Wales and Bath before he finally reached London in October 1836.

He enrolled at the Hunterian School of Medicine in Great Windmill Street and a year later began clinical medicine at the Westminster Hospital. He qualified M.R.C.S. and Licentiate of the Apothecaries Society in 1838 and set up as a practitioner in Soho. The following years were probably hard ones for the young surgeon, but he attended the outpatients department of Charing Cross Hospital and continued to read widely in the subject of medicine. He went on to higher qualifications, passing the London M.B. in 1843, and in the next year he was placed in the First Division of the London M.D.

Despite the difficulties he encountered in earning a living, Snow was content to remain in London as long as he had an outlet for the results of his experiments and investigations. This he found in the Westminster Medical Society, which he joined as a student in 1837. Gradually he came to receive a hearing from the Society and soon it was obvious that Snow's interest was principally directed to the respiratory system and the effects of drugs and poisons that affected the body via that system. He reported the results he obtained in experiments on the inhalation of carbon dioxide, and entered into discussion on emphysema, asphyxia and the physiology of respiration in the newborn and in cases of chest deformity.

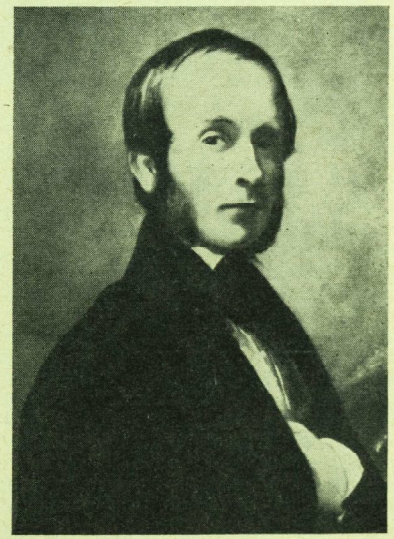
The vivid impression that he must have gained of cholera at Newcastle and his knowledge and interest in the physiology of respiration were the necessary stimuli that led to his two great contributions to medical science. John Snow had the ability, determination and greatness of mind to apply the lessons of his early years to the problems that arose in his maturity with the discovery of anaesthesia and the revisitation of cholera to this country.

Cholera

John Snow's experiences among the miners of Killingworth in the cholera epidemic of 1832 must have left a deep impression on his mind. He was (when not yet 19), sent out to treat a disease of startling rapidity and high mortality with a pack of empirical remedies and common sense. Richardson says "in this labour he was indefatigable and his exertions were crowned with great success." Newcastle had the third highest mortality of any town in the country: the epidemic ran for a month resulting in 801 deaths and in the neighbouring colliery villages there were over 250 dead. The legacy of this terrible month may well have been to leave with Snow a determination to discover the real cause of the disease.

In the following years Snow came to London and gained his medical qualifications, building up a general medical practice and, with the discovery of anaesthesia, vigorously developing his knowledge and understanding of the actions and administration of anaesthetics. It was 16 years after Snow's Killingworth days that cholera broke out again. Having made its ominous way across Europe cholera came to England in the autumn of 1848 and in the summer of 1849 it raged throughout the country, causing 53,000 deaths in England and Wales and over 14,000 deaths in London. During the epidemic the Lancet published a spate of letters announcing innumerable cures for and causes for cholera. One cynical writer capped them all by collecting the remedies advocated, fifty in all, ranging from cayenne pepper, croton oil and chloroform to the reeking skin of a fresh slaughtered sheep.

Despite his being absorbed in anaesthesia Snow turned his mind to cholera. Already he was mentioning his theories by the autumn of 1848 to recognized authorities on cholera and whilst the epidemic lasted he collected evidence to support his views. In August 1849 he published *'On the Mode of Communication of Cholera'* a pamphlet of 31 pages. Snow claimed that cholera was a communicable disease affecting the almentary system and the general symptoms were all attributable to the loss of fluid in the body. The cholera poison was to be found in the vomit and excreta of infected persons, and, as well as by personal contact and the eating of contaminated uncooked food, Snow considered that cholera was spread by the emptying of sewers into the drinking water of the community. Infection was by swallowing the poison which probably consisted of "organised particles" not capable of indefinite division. He stated his opinions : "Not as matters of certainty, but as containing a greater amount of probability in their favour than any other in the present state of our knowledge." Snow supports his conclusions by quoting, among others, cases of personal



JOHN SNOW AS A YOUNG MAN
(reproduced by kind permission of Miss Una Snow)

infection and a limited but very fatal outbreak in a terrace of houses in Wandsworth. Here all the evidence pointed to the water supply being the agent of infection. Snow realized at the time that his researches were supported by insufficient evidence. He concludes "It would have been more satisfying to the author to have given the subject a more extensive examination and only to have published his opinions in case he could bring forward such mass of evidence in their support as would have commanded ready and almost universal assent: but being preoccupied with another subject (i.e. anaesthesia) he could only either leave the enquiry or bring it forward in its present state and he has considered it his duty to adopt the latter course . . . "

MINERS COTTAGES AT KILLINGWORTH

(reproduced by kind permission of Mr. S. P. W. Chave)

Our knowledge of Snow's early views on the transmission of disease is limited. Current theories mostly favoured the idea of effluvia emanating from the sick and the effects of damp atmosphere or obnoxious smells. The causes of a disease were divided into predisposing and exciting. Predisposing causes of cholera might be the place you lived in, exciting causes the state of the weather. By 1838 Snow saw reason to believe 'typhus' was contagious and in 1839 he disagreed with the 'malaria' theory that the products of animal decomposition caused ague. The question of contagion had secured as many opponents as supporters, and its history is beset with controversies. Ignorant of the actual causes, doctors did not know which way to turn in the light of conflicting evidence. Frascaturo in 1546 and Kircher in 1658 had suggested the basis of contagion and the existence of micro-organisms. Sydenham in the latter part of the 17th century wrote of pestilential particles and infection from carriers, but obscured the idea with theories of miasma, disurbances of the humours and climate and atmospheric influences. Webster in 1799 cites many cases against the theory of contagion. In 1840 Henle suggested a germ theory of contagion. Thus, though the works of Hunter and Jenner show that there is a communicable poison, the extreme diversity of opinion, and the often inexplicable circumstances surrounding cases of disease, only served to confuse the issue. And in the living conditions of the day there was so much that supported the 'malaria' theory. In 1842 the Report on the Sanitary Conditions of the

Labouring population of Great Britain gave examples of the most frightful squalor: in Inverness there were very few houses with a W.C. or privy and only 2 or 3 public privies for the great bulk of inhabitants: in London the night soil overflowed from cesspools to a depth of three feet in two houses. In Manchester there was so much rubbish and mud in the streets that the ambulances could not get to the houses to take the sick away : in Glasgow here were dung heaps behind the tenements instead of lavatories and the excrement was a profitable source of manure. A revealing cri du coeur was published by "The Times" in 1849:

The Editor of The Times Paper.

Sur,

May we beg and beseach your proteckshion and power, We are Sur, as it may be, livin in a Willderniss, so far as the rest of London knows anything of us, or as the rich and great people care about. We live in muck and filthe. We aint got no privez, no dust bins, no drains, no water-splies, and no drain or suer in the hole place. The Suer Company, in Greek St., Soho Square, all great, rich and powerfool men, take no notice watsomedever of our cumplaints. The Stenche of a Gully-hole is disgustin. We all of us suffer, and numbers are ill, and if the Colera comes Lord help us.

Some gentlemans comed yesterday, and we thought they was comishoners from the Suer Company, but they was complaining of the noosance and stenche our lanes and corts was to them in New Oxforde Street. They was much surprized to see the seller in No. 12, Carrier St., in our lane, where a child was dyin from fever, and would not believe that Sixty persons sleep in it every night. This here seller you couldent swing a cat in, and the rent is five shilling a week; but theare are greate many sich deare sellars. Sur, we hope you will let us have our complaints put into your hinfluenshall paper, and make these landlords of our houses and these comishoners (the friends we spose of the landlords) make our houses decent for Christions to live in.

Preaye Sir com and see us, for we are livin like piggs, and it aint faire we shoulde be so ill treted.

We are your respeckful servents in Church Lane, Carrier St., and the other corts.
Teusday, Juley 3, 1849.

The drawback to the acceptance of the contagion theory was the effectiveness of general sanitation measures in cutting down disease. Chadwick, one of the great sanitarians of the century showed that drainage and sanitary improvements stopped an epidemic of dysentry in Cork and generally reduced the incidence of disease. The care of public health proceeded under the banner of sanitary reform. Conditions were so bad that people could not visualise anything so theoretical as contagious organisms. It was in fact the right cure, but the cause was not accepted.

The effect of Snow's tract on Cholera was minimal. He had 125 copies printed at his own expense, of which only 30 copies were sold, at a shilling each. The Lancet commented that "the arguments adduced by the author against emanations causing the disease are by no means conclusive" and "Dr. Snow's exclusive views must be received with great limitation". In the report on the Epidemic Cholera of 1848-49 by the General Board of Health no mention is made of Snow's views and the blame for the epidemic is laid on atmospheric pollution aggravated by the poor sanitary conditions. In 1848 the Metropolitan Sanitary Commission considers that specific contagion is harmful only when concentrated in confined spaces : that "when Cholera first appeared in this country the general belief was that the disease spreads principally if not entirely by communication of the infected with the healthy. The General Board of Health report of 1850 states "the late extended experiences has shed no light on the primary or proximate causes of this pestilence".

In 1852 the Registrar General published a report on the cholera epidemic in which Snow's views are discussed with the opinion that the facts "lend some countenance to Dr. Snow's theory".

In 1854 Dr. Baly and Dr. Gull wrote a report for the Royal College of Physicians. Snow's theory is rejected—"the theory as a whole is untenable" and the miasma theory is upheld.

Snow was not content to let his theories be propagated solely by his pamphlet and in 1849 the London Medical Gazette and the Medical Times of November 1851 published his views. Subsequently Snow was elected Orator of the Medical Society of London, with which the Westminster Society had joined in 1849, and his oration, delivered in

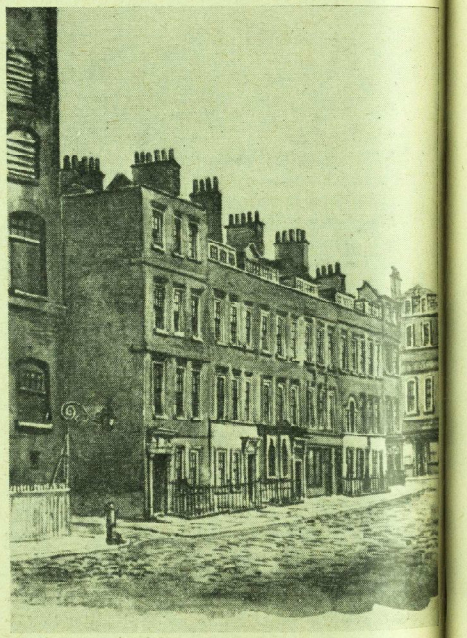
March 1853, deals mainly with his reasons for considering cholera among others a communicable disease. He infers that the communicable cause of disease "resembles a species of living being", despite the fact that we cannot see it, from the manner of its growth and reproduction, and he brings forward evidence and reasons against the rival theories of the day. The Society were so impressed that the oration was published "by request of the society". Again he wrote an article for the Medical Times, published in October 1853 and in February the next year he presented to the Epidemiological Society a rational mode of treatment of Cholera based on his views on the communication and pathology of the disease. When Cholera again broke out in England in the summer of 1854 Snow had given the medical profession ample opportunity to pay heed to his opinions.

The Epidemic of 1854-55

Snow's theory by this time lacked only that mass of evidence necessary to support it. This epidemic supplied it in horrible abundance, as a result of which Snow published in November 1885 a second edition of his pamphlet 'much enlarged'. It was in fact a clearly reasoned book that presented a great number of cases illustrating the communication of cholera on small and large scale. Well marshalled facts drive home his theories and his arguments refute the conflicting theories of the day. Snow states the pathology of the disease and reasons that "the morbid matter of cholera having the property of reproducing its own kind, must necessarily have some sort of structure, most likely that of a cell". It was not until 1863 that Pasteur's work established the connexion of micro-organisms and disease. Snow lays down principles of personal and public hygiene that are essential in the prevention of the spread of disease. The outstanding ability of Snow is however shown in the conduct of his researches and the evaluation of the facts in two centres of the epidemic. One was a strictly localised outbreak of devastating severity, centred on the Broad Street pump near Golden Square, Soho. The other was "an experiment on the grandest scale" in the parts of London South of the Thames. Here the inhabitants received water from two different companies, one of which supplied relatively pure water and the other water grossly contaminated with London sewage. Snow uses the statistics of cholera mortality in these districts to provide the most convincing proof of his theory.

The Broad Street Pump

Snow had already started his researches in South London when a disastrous outbreak of cholera occurred in Soho. Broad Street was the centre of an area partly residential and partly commercial. There were the houses of middle class tradesmen and houses of a much poorer sort : a workhouse with five hundred inmates, a percussion cap factory employing 200 people and a brewery employing 70 : there were shops, coffee houses, public houses and many small workshops in the area. As soon as Snow heard of the outbreak he suspected the pump in Broad Street : this was a popular pump supplying many in the area and preferred by some to a nearer water supply. It was used in the eating houses in the neighbourhood, and a tub of it was kept for the workmen in the factory. There was a piped supply from the Grand Junction and New River companies but this was intermittent, being turned on for only a few hours each day. Householders had to store it in tubs open very often to the weather, never cleaned out and in the hot summer this supply must have been unpleasant compared with the pump water.



BROAD STREET,
MID-NINETEENTH CENTURY
(reproduced by kind permission of
Mr. S. P. W. Chave)

During the last few days of August 1854 there were one or two deaths occurring each day in the area. Suddenly the mortality shot up: on Sept. 1st, 70 people died; 127 died the next day and over 300 in the following week. As soon as he heard of the outbreak Snow suspected the pump. From his knowledge of cholera Snow worked out the date of the probable infection of the well and personally investigated the 83 deaths in the area registered since that date. In only fourteen cases did his researches not definitely incriminate the pump. That, and the extreme severity of the outbreak in such a limited area was enough to convince Snow that action must be taken to close the pump. In the evening of the 7th September Snow explained his reasons to the Board of Guardians of the parish and the next day the pump handle was removed. It was an action of such beautiful simplicity that it would be satisfying to record that the epidemic came to a dramatic close. But in fact the cholera mortality had declined with as much rapidity as it had at first risen. The population had deserted the area and of course the cholera *vibrio* does not have an indefinite life in water. Snow himself does not make any claim for proof resulting from his initiative, but the simplicity of his action has seized the imagination of subsequent writers, including Richardson, who attribute the ending of the outbreak to the removal of the pump handle. The greatness of Snow's work lies in his investigation, not in the prevention of any one outbreak. His work in connection with the Broad Street pump continued with the collection of supporting evidence all pointing to the source of infection being the pump. Perhaps the most striking case is that of the lady living in Hampstead who had Broad Street water sent out to her every day. She and a niece who was visiting her drank the water. The lady died from cholera and the neice returned to her home in Islington, was attacked with cholera and also died. Neither at Hampstead nor at Islington was there any cholera at the time.

Snow prepared a map showing the places of residence of all those who died from cholera, including those of the sick who were removed to the Middlesex hospital where Florence Nightingale was working. The black marks cluster incriminatingly around the Broad Street pump.

Following the outbreak a local Committee of Enquiry was set up on to which Snow was co-opted. After Sir Benjamin Hall, the president of the General Board of Health, had refused his help, the Committee circulated a questionnaire, with little success. Then, following Snow's methods, the interviewing team undertook a house to house visit, armed with a list of twenty four questions, drawn up by Snow and Dr. Lankester, the Chairman. This had a better result, and the committee prepared and published a report of the outbreak. Snow submitted an individual report that followed the lines of his previous investigations. One of the interviewers was a Rev. H. Whitehead who also submitted an individual report. Whitehead was the curate of a neighbouring church, who showed much courage and initiative in the cholera epidemic in London. He was at first sceptical of Snow's theory and wrote to him to tell him so. He instituted his own enquiry in Broad Street itself and found the evidence so conclusive that he did not hesitate to confirm Snow's results.

Snow had had the pump opened at the time of the outbreak but could find no definite proof of a source of contamination. Whitehead, whilst going through the Registrar General's returns stumbled on the case which gave rise to the epidemic. Two days before the violent outbreak an infant was attacked with choleraic diarrhoea in No. 40 Broad Street : she died four days later. Whitehead found that the mother washed the nappies and tipped the water into a cesspool which lay within feet of the pump well. Again the well was opened and this time there was clear evidence of the contamination of the water through defective brickwork.

An Experiment on the Grandest Scale

During the epidemics of 1831-32 and 1848-49 the poor crowded areas south of the Thames suffered the highest mortality in London. The companies responsible for the water supply throughout most of south London were the Southwark and Vauxhall and the Lambeth Water Works. These companies drew their water from the Thames in the heart of London, which was grossly contaminated with the sewage and refuse of the metropolis. They shared the dubious distinction of supplying the most polluted water, and to the areas worst hit by cholera. In the growing tide of Sanitary reform after the 1849 epidemic Parliament required the water comies of London to remove their intakes above the tidal reaches of the Thames, but by 1854 supplying much purer water from Thames Ditton.

It was a magnificent opportunity for Snow. During the preliminary outbreak of cholera in 1853, the effect of the purer water supply on the cholera mortality began to be apparent to his watchful eye. He then had only to find out the water supply to those houses in which a death took place, to produce the most conclusive evidence. But more important that that, Snow found out that in the districts of Southwark and Lambeth, the water supply to individual houses was arranged on the most haphazard basis. The mains of the two companies ran down each street, supplying the houses of rich and poor alike, some by one company, some by the other according to the whim of the owner or occupier at the time when the two companies were competing for customers.

"No fewer than 300,000 people of both sexes, of every age and occupation, and of every rank and station, from gentlefolk down to the very poor, were divided into two groups without their choice, and, in most cases, without their knowledge: one group being supplied with water containing the sewage of London, and, amongst it, whatever might have come from the cholera patients, the other group having water quite free from such impurity".

It was ideal material for the application of statistical methods and Snow showed himself to be decades ahead of his time in his application of it. Having obtained the addresses of each person dying from cholera in the area, he began a laborious house to house visitation, enquiring the water supply of each place where a cholera death had taken place. In many cases the occupants could not tell him, but he found that the salt content of the Southwark and Vauxhall water from the tidal reaches was so much greater than the purer water from Thames Ditton that it gave him a simple and accurate means of distinguishing the supply. Snow continued his enquiries into those areas supplied by either water company, alone, in order to obtain a comparison with the districts where the supply was from both. The task was so great that he paid for the assistance of a qualified medical man to help him. During a four week period at the beginning of the epidemic they investigated 334 deaths from cholera. The result of this first four week period showed that the Southwark and Vauxhall Company supplied houses with a mortality of 71 per 10,000 houses whilst the Lambeth supplied houses with a mere 5 per 10,000 mortality. Later, at Snow's instigation, the district Registrars were requested to include in their returns, the water supply of each house in which an attack of cholera took place, and Snow carried his enquiries down to the date on which this requirement became effective. In all, he himself investigated over 650 deaths, during the first seven weeks of the epidemic. As the epidemic progressed the disparity of the two mortality rates decreased, which Snow attributed to the many other modes of transmission having their effect. But from his own and the Registrar General's figures Snow was able to show that in a 14 week period the mortality of the population supplied by the Lambeth Company was still only one-sixth of that supplied by the Southwark and Vauxhall Company.

Snow continued his book by examining the effect of other water supplies in London and the larger towns in England. He considered and produced evidence against most of the conflicting theories of the day regarding cholera, and extended his arguments to cover other diseases, including typhoid, dysentry, plague and yellow fever. In view of the utter ignorance at the time of the special vectors of these last two diseases one cannot judge him harshly on what was after all a mere addendum to his main thesis. He concluded his work with an admirable list of precautions to be taken in cases of contact with communicable diseases and a list of important public health measures to oppose their spread. Although Snow knew the total number of houses supplied by each of the South London water Companies, he did not know the number supplied in the separate sub-districts. He thus could not calculate the mortality rates in the sub districts at the time of his invesigations. However, shortly afterwards the General Board of Health instituted an official enquiry which supplied him with the detailed statistics of the population. In Richardson's new 'Journal of Public Health' Snow published a paper on "Cholera and the water supply in the South Districts of London in 1854". This paper continues his analysis of the mortality from Cholera, using the detailed figures from the recent report, and all his conclusions confirm his previous findings. It is in fact the statistical culmination of an already firmly established argument.

Snow's work obtained many admirers and many opponents. His book which cost him £200 to prepare and publish, sold only 56 copies and he received only £3. 12. 0d. after the deduction of the publisher's commission. The Lancet reviewed the book with qualified approval, although admitting the impossibility of over-estimating the importance of Snow's theory of the spread of cholera in water. But the malaria theory still held the field. John Simon, one of the outstanding figures in Public Health in the nineteenth century, reported to the General Board of Health in 1856 that "faecalised drinking water and faecalised air equally may breed and convey the poison". Florence Nightingale attributed cholera to bad air and the emanations proceeding from animal excretions and decaying vegetable matter. In 1858 Simon refers to Snow's "peculiar doctrine" and passes it off as "of use in contributing to draw attention to the vast hygienic importance of a pure water supply". In 1874 Simon admits the merit of Snow's arguments and in 1890 he makes the handsome but belated admission that Snow's work "May probably still be counted the most important truth yet acquired by medical science for the prevention of epidemics of cholera".

In Snow's lifetime there was little public recognition. In 1856 his book was translated into German, but Snow's theory had to contend with the accepted theory of miasma and the predisposing cause of the often appalling sanitary conditions. The foul state of the Thames provoked a letter to "The Times" from Professor Faraday comparing the river to a sewer, which Punch illustrated with a devastating cartoon. The country lacked enough men capable of thinking in straight lines on the problem, and although Snow in 1856 brought figures to show the lack of connection of malodorous trades with a high cholera death rate, Willim Budd accurately pointed the prevailing opinion. In 1856 Budd, who did for typhoid what Snow did for cholera, wrote that against the theory of contagion, "the great weight of medical opinion in this country is directly opposed. Not to speak of minor notabilities, the whole prestige of the Board of Health and the London Royal College of Physicians may be cited against it. To make increasing and implacable war against contagion and contagionists seemed with the former, indeed, to be, for some years, the chief purpose of its existence".

In 1855 Snow was called before the Select Committee of the Public Health and Nuisances Removal Bill and he spoke against the theory of malaria causing disease. Part of his evidence was seized upon by the Lancet and he was soundly castigated in a leading article. He was accused of being in league with those, who, in their trades, create offensive smells regardless of the effect on the general health. Scornfully the Lancet wrote, "The fact is, that the well whence Dr. Snow draws all sanitary truth is the main sewer. His specus, or den, is a drain. In riding his hobby very hard, he has fallen down through a gully hole and has never since been able to get out again."

Snow however viewed the rejection of his doctrine with prophetic calm. He looked beyond the disputes of his time.

"You and I" he would say, "May not live to see the day, and my name may be forgotten when it comes, but the time will arrive when great outbreaks of cholera will be things of the past; and it is the knowledge of the way in which the disease is propagated which will cause them to disappear".

To be continued in the October Journal.

Sports News

VIEWPOINT

Two or three times a week, throughout both summer and winter, the athletic ground at Chislehurst is invaded by a host of "sporting types", with the idea of taking some form of exercise. The rugger, soccer and hockey players in the winter find the pitches in perfect condition, while in the summer, the cricket pitch is always beautifully prepared, and the tennis courts approach Wimbledon standards. These facts are taken for granted by the average student. But one can imagine the shock there would be if, for instance, the hockey pitches had not been rolled, or the tennis courts had not been watered during the drought this summer. Yet similar conditions are often seen on grounds all over London, including those grounds of other hospitals.

Few students realise how lucky we are to have such a capable groundsman and wife as Laurie and Mrs. White to look after Chislehurst for us. They both put a phenomenal amount of care and effort into what must be at times a rather tedious job, and, thanks to them, our sports ground is one of the best known grounds in London. It is to be hoped that they continue to be in charge of the athletic ground for many years to come.

★ ★ ★

SAILING CLUB REGATTA

The regatta was held once again at Burnham-on-Crouch on June 10th-12th and we were able to make use of the facilities of the United Hospitals Sailing Club. As some members had arrived on the Tuesday evening, an early start was possible the following morning and several boats were taken out for an hour's sail before the cooks were put ashore to prepare lunch.

As several people had arrived by this time it was hoped to organise a race for the afternoon. However, many of the helmsmen were unfamiliar with Sharpies and by the time they had overcome their difficulties it had been decided to abandon the race until the following day.

The breeze was light on Thursday and two races were arranged for the Commodore's Trophy. In the first race Bill Fischer quickly took the lead and held it to the end. Tony Geach had bad luck when his mainsail collapsed and he had to retire. Ken Walker was second and Mr. Alment had a close race for third place. The afternoon race was again won by Bill Fischer with David Welch second and Mrs. Roles third.

The Sailing Club Annual Dinner was held at the Royal Burnham Yacht Club in the evening; we were disappointed that no officers of the club were present.

On Friday the members present sailed up river to Fambridge where a picnic lunch was taken at the "Ferry Boat Inn".

We would all like to thank the ladies for their excellent catering and Colin Birt for organising the regatta.

Fewer people were present at the regatta than in recent years despite wide advertisement of the event. The fact that the three regatta days have now to be counted as official holiday should not deter keen yachtsmen, and many men have had their first experience of sailing at these fixtures and have then gone on to become quite expert. For the inexperienced the firefly on the Welsh Harp offers an ideal opportunity of learning how to handle a racing dinghy, which, while a thoroughbred, can be quite docile. The regatta is open to staff and students alike and it is hoped that next year more people will come and spend a few days messing about in boats.

D. Welch.

★ ★ ★

CRICKET

1st XI v. Past XI, at Chislehurst, on July 5th.—Match drawn.

This was a very enjoyable game, which took place in glorious sunshine. Bart's batted first and found runs difficult to get against Whitworth and Lucas. Wickets fell at regular intervals, and we were finally all out for 193, Juniper playing better than he has ever done before, carrying his bat. Stoodley and Savage both gave him very good support.

The Past batting looked somewhat rusty, and found runs even harder to get, against Garrod and Stoodley. Seven wickets were down for 82 runs, but the remaining batsmen took the score to 150. The last pair played out the last few overs with confidence, Mr. O'Connell, our president, playing with skill that belied his age, making, in particular, one memorable straight drive to the boundary. An exciting finish to a good match.

Once again, our thanks to Mr. O'Connell for helping to make the day such an enjoyable one.

Bart's: 193 (Juniper 82 not out, Stoodley 25, Savage 21).

Past: 150—9 (Stephen 49, Hunt 35 not out, Whitworth 27).

1st XI v. Incogniti, at Chislehurst, on July 11th.—Won by 5 wickets.

This must be one of the most remarkable victories the club has ever had, with such high scores as have not been seen for many years. Even the Manchester Guardian commented on the feast of runs.

Incogniti batted first, and against bad bowling and some of the worst fielding ever seen at Chislehurst, scored 293 for the loss of only four wickets. One of their opening bats scored 143, after being dropped twice before reaching 20. We were set to score the runs at the rate of 95 an hour.

Davies and Pagan gave us a good start, with 67 runs in 55 minutes. Then Merry continued the good work for a while. But with only 80 minutes to go, five wickets were down and 167 runs were still needed. Harvey and Stoodley came together and played themselves in. With 60 minutes to go, 140 runs were still needed, and the rate of scoring was always just behind the clock, and with only 10 minutes left, 30 runs were still needed. But amidst great excitement the winning run was scored with two balls left. Harvey batted magnificently, scoring the first century for Bart's for many years. Stoodley also hit extremely well.

Incognito: 293—4 declared (Marshall 143 Stoodley 3-72).

Bart's: 294—5 (Pagan 58, Harvey 111 not out, Stoodley 58 not out).

1st XI v. Hampstead, at Chislehurst, on July 12th—Match drawn.

Bart's: 259—8 declared (Davies 88, Harvey 70, Robson 29).

Hampstead: 254—6 (Houghton 96).

1st XI v. Nomads, at Chislehurst, on July 18th. Won by 4 wickets.

Faced with a comparatively weak team, we made rather heavy weather of the game. Nomads batted first, but after an opening stand of 66, were in great trouble against Davies and Harvey, and helped by two very good stumpings by Warr, were all out for 117.

It seemed at one stage that we would win without loss of wickets, as Davies and Pagan had an opening stand of 71. But Pagan was run out, and from then on, wickets fell rapidly. Warr, batting sensibly, finally saw us home.

Nomads 117 (Davies 5-33, Harvey 5-38).

Bart's 119—6 (Davies 39, Pagan 24).

1st XI v. Dartford, at Chislehurst, on July 19th. Lost by 14 runs.

Dartford: 257—7 declared (Davies 4-78, Harvey 3-65).

Bart's: 243 (Davies 80, Warr 75, Robson 27).

Inter-firm 6-a-side Cricket Competition, on Saturday, July 25th, at Chislehurst.

This was the first time such an event had been held, and proved to be a great success. It was a warm sunny afternoon and the occasion was graced by the presence of one of our vice-presidents, Sir James Paterson Ross. Ten teams were entered, and after many exciting contests in the early rounds, the competition was won in almost complete darkness by the pre-clinical team, ably led by Peter Savage, who beat the finalists in the final.

Each innings lasted for 10 overs, every player bar wicket-keeper having to bowl. This lead to some high scoring in a number of games. The main interest in the afternoon was contributed by a ladies' team, which acquitted itself very gallantly, and two Americans who had their first sight of the game. One often reads about players dropping their bat and dashing for cover point, but it is rarely seen.

About eighty people stayed on for the informal dance in the evening. This number exceeded our greatest hopes, and helped to round off the day in a wonderful manner.

I think it can be said that this event was greatly enjoyed by all, and will be well worth repeating in future years. Our thanks in particular to Mr. and Mrs. White, who helped to make it such a success.

Cricket Tour, August 2nd-7th.

Once again the cricket club descended on Rottingdean in Sussex, for its annual cricket tour. This year, we were blessed with glorious weather, and all the matches were played.

The social side of the tour was not forgotten. The Grand Prix track on the West Pier at Brighton now appears to be banned to Bart's students, and the inhabitants of Steyning Road won't forget in a hurry the nude figure with counterpane which held forth with full vocal power to some innocent anglers passing by.

The results are not very impressive on paper, but five of the six matches had a very close finish, and our two defeats could easily have gone the other way.

Everyone played their part, but one or two individual performances must be mentioned. The greatest success of the tour was Stoodley. He scored more runs than anyone else, his best innings being against Barcombe, where he scored 101 in 85 minutes. He also took 25 wickets. Rottingdean will long remember one over from him in which he clean bowled three of their best batsmen. Savage should also be mentioned for his fine work behind the stumps. The lively wickets that were played made a bowler of Stoodley's pace a very difficult proposition. Savage kept wicket better than ever before.

RESULTS:

Sunday, August 2nd v. Mariners.—Won by 16 runs.
Bart's 143 (Merry 39, Davies 30, Pagan 29).
Mariners 127 (Stoodley 5-71, Abell 3-22, Davies 2-12).

Monday, August 3rd v. St. Andrew's, Burgess Hill. Won by 87 runs.
Bart's 252—6 declared (Harvey 53 not out, Merry 53, Stoodley 37, Abell 30).
St. Andrew's 165 (Davies 4-20, Harvey 2-21).

Tuesday, August 4th v. Rottingdean. Lost by 1 wicket.
Bart's: (143 Pagan 29, Davies 28, Bamford 25).
Rottingdean: 147—9 (Stoodley 6-53, Davies 2-30).

Wednesday, August 5th. v. Ditchling.—Won by 4 wickets.
Ditchling: 131-9 declared (Garrod 4-43, Stoodley 3-45).
Bart's 132-6 (Pagan 32, Fell 29, Abell 26 not out).

Thursday, August 6th. v. Barcombe.—Match Drawn.
Bart's 273—7 declared (Stoodley 101 not out, Pagan 45, Price 45, Fell 35).
Barcombe 203—9 (Stoodley 4-23).

Friday, August 7th v. Newhaven.—Lost by 3 wickets (12-a-side).
Bart's: 107 (Harvey 24).
Newhaven: 108—8 (Stoodley 5-50 Garrod 2-32).

UNITED HOSPITALS CUP FINAL

1st XI *v.* Guy's Hospital at Hornsey on September 9th, 10th and 11th

Lost by 8 wickets

This was a disappointing result for us, since we had entered this match with so much confidence. The main reason for the defeat was the fact that in both innings, most of our regular batting, of which so much was expected, failed against a no more than average attack.

We won the toss, and on a perfect batting wicket, batted first. We really lost the game in the first hour, when we lost 7 wickets for 41 runs. Batsmen appeared to find devious ways of giving away their wickets. It wasn't until Harvey and Stoodley came together that sanity was restored to the proceedings. They shared in a stand of 92, and this was followed by another stand between Harvey and Merry of 49 runs. All three batsmen played extremely well and sensibly in the circumstances.

Guys lost a wicket to the first ball of the innings, and were 2 wickets down with only 16 runs on the board. But our success stopped there, with the entry of Cook, the Cambridge Blue. He batted throughout the whole of the rest of the innings, and was the last man out, after amassing 177 runs. He looked a class above anyone else, and never gave the vestige of a chance. Our bowling was good though not spectacular, and the fielding was satisfactory, though it could have been better. No chances were missed, and we did well to dismiss the remaining Guy's batsmen so cheaply.

When we batted again, we had a good opening stand of 48. But when Pagan was out, the middle order batsmen again inexplicably threw their wickets away. Six wickets were down for 99, and it was again left to Harvey and Stoodley to stop the rot. They added 33 runs, and later there was another excellent stand between Harvey and Merry, which put on 71 runs. Davies batted well, but the rest of the batting was most disappointing. Guys only had to score 92 to win, which they did with little trouble.

In spite of the result, much credit must go to John Harvey who lead the side exceedingly well, and batted magnificently. He held the batting together, by scoring 125 runs, and was only dismissed once.

Bart's: 1st Innings.

J. D. Davies, bowled Dyde	14
W. H. Pagan, ct. Dyde, bowled Leigh-Browne	0
C. P. Juniper, bowled Leigh-Browne	4
A. C. Warr, bowled Dyde	16
H. R. J. Walker, bowled Leigh-Browne	7
A. Whitworth, l.b.w. Leigh-Browne	0
J. A. Harvey, ct. Bury, bowled Cook	57
B. J. Stoodley, ct. and b. Leigh-Browne	48
J. D. Abell, bowled Leigh-Browne	0
R. T. G. Merry, bowled Cook	32
J. A. Garrod, not out	0
Extras	10
Total	188

Wickets:
1—14 2—14 3—21 4—37 5—41 6—41 7—41 8—133 9—182

2nd Innings.

J. D. Davies, bowled Gibson	53
W. H. Pagan, ct. Pagliero, b. Dyde	15
C. P. Juniper, bowled Dyde	0
A. C. Warr, ct. Juniper, bowled Dyde	12
H. R. J. Walker, bowled Dyde	0
A. Whitworth, ct. Sievers, b. Leigh-Browne	3
J. A. Harvey, not out	68
B. J. Stoodley, l.b.w. Cook	16
J. D. Abell, bowled Dyde	4
R. G. T. Merry, ct. Sievers, bowled Cook	33
J. A. Garrod, l.b.w. Cook	0
Extras	16
Total	220

Wickets:
1—48 2—48 3—76 4—75 5—85 6—99 7—132 8—149 9—220

Bowling:
J. A. Dyde 18—4—46—2
A. Leigh-Browne 15—6—39—6
I. Gibson 8—1—42—0
G. W. Cook 12.3—4—43—2
R. Tanner 2—0—8—0

Guys: 1st Innings

M. Pagliero, ct. Harvey, bowled Stoodley	0
R. Juniper, bowled Abell	42
I. Gibson, bowled Whitworth	7
G. W. Cook, bowled Whitworth	177
J. A. Dyde, bowled Harvey	19
T. Huins, bowled Stoodley	0
R. Myall, ct. Warr, bowled Whitworth	5
G. Bury, bowled Walker	15
J. Sievers, ct. and bowled Abell	3
R. Tanner, l.b.w. Whitworth	5
A. Leigh-Browne not out	4
Extras	40
Total	317

Wickets:
1—0 2—16 3—121 4—150 5—151 6—172 7—259 8—282 9—304

Bowling:
Stoodley 27—6—101—2
Garrod 2—1—5—0
Whitworth 21—1—79—4
Harvey 11—2—35—1
Abell 12—3—22—2
Walker 7—0—32—1

2nd Innings

M. Pagliero, l.b.w. Whitworth	6
R. Juniper, not out	39
I. Gibson, l.b.w. Abell	28
G. W. Cook, not out	4
Extras	17
Total for 2 wickets	94

Wickets:
1—27 2—72

Bowling:
Stoodley 3—0—18—0
Whitworth 4—0—28—1
Abell 4.4—0—22—1
Walker 2—0—6—0
Juniper 1—0—3—0

1st XI v. Old Dunstonians, at Beckenham, on August 13th. Won by 138 runs.

A very convincing win against not very strong opposition. This match was a personal triumph for Davies, who not only batted beautifully, but also bowled extremely well.

Thanks to him, we were able to declare at 194 for 7. Davies hit strongly to all parts of the field, being particularly severe on anything pitched at all short.

The opposition batted very badly and never looked like reaching the total. Davies and Harvey both bowled well.

Bart's: 194—7 declared (Davies 136).
Old Dunstonians: 56 (Davies 5-35, Harvey 4-20)

1st XI v. Wimbledon, at Wimbledon, on August 29th.—Match drawn.

A rather remarkable match before tea, but it fizzled out into a disappointing draw afterwards.

When we batted, we lost both opening batsmen for 10 runs. This brought together Juniper and Warr, who in the next 120 minutes, put on 200 runs. Both scored a century, and batted magnificently. It was a delight to watch such an exhibition of stroke play.

Wimbledon were left an equal amount of time to score the runs, but after losing 4 wickets for 90 runs in 70 minutes gave up the chase, and were content to play out the rest of time. Harvey bowled very well, taking 5 wickets in all.

Bart's: 211—4 wickets declared (Juniper 102, Warr 101).
Wimbledon: 179—6 wickets (Harvey 5-49).

★ ★ ★

MEN'S TENNIS, 1959

The benign summer enabled us to play our matches under the most pleasant conditions, and only a couple of games had to be cancelled through bad weather.

The first team won eight rubbers and lost five. This record would undoubtedly have been bettered had the full team been available on more occasions. Unfortunately, Cambridge finals cut across the season and we will have to foster adequate reserve strength. Fortunately there are signs, not only of keenness, but of ability amongst the Charterhouse contingent. The standard of play was at times very good, and there was an excellent victory over Sandhurst.

At no time did we find courts to equal the really excellent ones at Chislehurst, and we must thank Lawrie White for keeping them in such condition.

The following played regularly for the 1st VI. A. J. Gordon (Capt.), A. T. Seaton (Sec.), Dr. D. Smythe, Dr. S. Contractor, J. H. Pennington, C. A. McNeill, M. Jennings and D. Prosser; and for the 2nd team, A. Stewart, M. Perry, D. Lathan, P. Kingsley, E. Shinebourne and A. Frank.

LADIES' TENNIS

1st VI v. London Hospital, on July 8th. Won—8—1.

1st couple: J. Arnold, J. Hartley.
2nd couple: P. Kielty, I. Tomkins.
3rd couple: A. Varten, J. Angell-James.

This was a very social occasion as it was far too hot for serious tennis. Rallies were few and far between, most points being won, or lost, easily and one long set only was played against each couple. This meant that one had to settle into a match very rapidly and establish a good lead early.

1st VI v. Middlsex Hospital, on July 11th. Lost—3—6.

1st couple: J. Arnold, P. Kielty.
2nd couple: E. Knight, I. Tomkins.
3rd couple: A. Varten, V. Jones.

A greatly changed team from the one forwarded for the cup match earlier in the season. Played in an almost gale force wind for the first half, the game was one of knowing where to aim the ball for it to curve back into court. The first pair unfortunately decided to change from their usual court positions and adopt a new plan, but hastily changed back again to their former method after losing the first match. Play was rather erratic on both sides, but the second pair did well to win two matches. The third couple only settled in to the game by the second match but still lost easily to all three couples from the Middlesex.

1st VI v. K.G.H. on July 18th Won—5—4.

1st couple: J. Arnold, J. Tuft.
2nd couple: I. Tomkins, A. Varten.
3rd couple: S. Cotton, A. Sinclair.

The last match of the season, and a most exhausting one. This time, the first couple, although playing some good shots, spent too long, settling into the games and threw away many opportunities, especially in the first match where they lost 6-4, 3-6, 3-6. The third couple fought hard, beating thirds in three sets with a score 7-5, 3-6, 6-2. But the match was won mainly by the perseverance of the second couple, who played steadily throughout to beat all three opposing couples—a very creditable effort.

In retrospect, this has been a most successful season. More matches than in previous years were played and none were cancelled owing to weather conditions. For the first time, we won the U.H. Cup—and also won 11 out of 13 1st VI matches. The clinicals team during July won two and lost two matches—and the 2nd VI lost the two matches played.

(*continued from p.* 236)

much of our route during the past twelve days. There was not a cloud in the sky and the view was so clear that Mont Blanc and the Chamonix Aiguilles, at a distance of 55 miles as the crow flies, seemed only a long stone's throw. A few hours later we were in Lugano. Sitting on the terrace in the warm summer evening, it seemed difficult to believe that the skis still strapped on the roof of the car had been used the same morning.

ST. BARTHOLOMEW'S HOSPITAL JOURNAL

Vo. LXIII No. 10 OCTOBER, 1957

EDITORIAL

The Centenary of the Fountain is an important event for Bart's men, for there can be little doubt that it is an influential symbol hardly less powerful than the zodiac. That the Fountain lies at the hub of the Hospital is true, but it is a still greater truth to say that the Hospital stands "Round the Fountain"—an expression which no one can avoid. The alpha and omega of events at Bart's are the Fountain: that distinguished band of gentlemen who dine together have chosen for themselves the title of the Fountain Club; the Journal published its best humour in "Round the Fountain"; what has not happened "Round the Fountain"—who knows?

The Journal is strangely lacking in references to the Fountain, and consequently interest has been kept alive by a considerable mythology broadening and changing with time, and playing with man as if of trifling importance. Some incidents are recorded in Dr. Bourne's article elsewhere in this Journal. Life *in* the Fountain continues to reproduce itself, or at least, should do so according to Professor Garrod in his correspondence with Mr. Carus Wilson and A. Fish (December 1955). His magnanimity in presenting two goldfish was intended for the preservation of the species, but even Professor Garrod, with his "greater biological experience" (to quote Mr. Carus Wilson) could not tell the two apart. The goldfish of the 1930's were more successful in their attempts and succeeded in increasing manyfold over night—although perhaps not quite so naturally as some were expecting at the time.

Yet the procreation of the race is of no small importance in a community in which conditions are by no means always favourable, for example, when the aesthetic enhancement of the Fountain by the addition of gentian violet was accompanied by at least one fatality. Worse, however, was the occasion of which A. Goldfish complained to the Journal in March 1955—as described by the poet Hogarth previously in the Journal on the occasion of the Residents' Dinner:

Some returning from the fray
Joyfully vomit in the passage way:
Others with shrieks torment th'indignant air
And micturate upon the fountain in the square—

. . . a tiresome hazard, as Mr. Goldfish remarks!—and indeed in this matter he is in agreement with Hesiod who (as early as the 8th century B.C.) begged that fountains should not be used as public conveniences—"but rather avoid doing so . . . for it is not good." On other disturbances Mr. Goldfish felt that his "gills must remain sealed"—but

the man who swam three laps has not been forgotten, nor has the houseman who was not considered to come up to the Bart's standard of cleanliness. Is this the origin of the traditional immersion of the captain of rugger?

There may be many possible uses for a Fountain: immersion is probably one, but the earliest Fountains of the Romans had the much more common-place purpose of providing water-heads to supplies which often came from far away. They were very proud of their water and it was a mark of distinction to cultivate the art of water tasting. This does not mean that they had no palate for anything stronger, and indeed on important state occasions their fountains flowed with wine. Neither were they the only nation to follow this custom. Goethe (in his autobiography) records that at the Coronation of the Emperor Joseph in 1764 a fountain was erected at Frankfurt which "had a basin on either side, and in the middle the two-headed imperial eagle spouted white wine into one basin and red wine into the other." Even in our own beer-drinking country, a fountain in Cheapside is reputed to have flowed with wine at the Coronation of Richard II. The Editor of the Journal in 1953 must have known of these precedents when in his Editorial (March) he recommended charging "the reservoirs with something a little more potent" to celebrate the Coronation of Her Majesty. The success of the Fountain Club's recent celebrations on October 8th was noticed, but the source of their champagne was unfortunately not the Fountain.

The occasion of this Centenary calls for one final comment on the Fountain with regard to its state of cleanliness. The cleanliness of housemen may have been doubted, but there is no question about the appalling state the Fountain had fallen into. It may be that Wordsworth's lines are true—

Pure Elements of waters! whereso'er
Thou dost forsake thy subterranean haunts,
Green herbs, bright flowers, and berry-bearing plants
Rise into life and in thy train appear . . .

but the only effect in this case is to give the Fountain an aura of neglected old age. Its ilumination on the occasion of the Fountain Club's celebration was pathetic. We hope that we will not have to wait long to see some improvements.

All the same, it would be almost true to misquote H. V. Morton's description of Rome, and say that "the sound of Bart's is the whisper and fall of her Fountain".

THERAPEUTIC ABORTION

Elsewhere in this issue appear three articles on various ethical approaches to therapeutic abortion by representatives of the three religions predominant in the Western Civilisation. It is interesting to see these articles side by side and to observe the range of views. That they all have views on the matter is to be expected, because all physicians or surgeons must always weigh the pros and cons of any mode of treatment before it is applied, and it is rejected if the risks outweigh the chances of success; the guiding principle is common sense with regard to the *Life* of the patient. That experienced doctors may disagree about the value of certain procedures is also to be expected because of insufficient scientific evidence, and each man must act according to his own opinions which he has formed from his own experience.

The particular case of therapeutic abortion is no exception to these principles. Religious bodies differ in their views not because their medical principles differ from each other or from anyone else, but because each regard intra-uterine *Life* in a different way. There is no disagreement that a therapeutic abortion usually involves the *active* destruction of a *Life*; if the case were as simple as this, there would be no argument, and this therapeutic measure could not in general be tolerated, and this in fact forms the essence of the Roman Catholic view. But the Jewish view, for example, discusses the question with the concept of a range of *values of Life*, and the justification for therapeutic abortion in certain instances is on the grounds that the foetal life is of *inferior value* to the maternal life (morally speaking). The Anglican view on the other hand, does not consider such a range of values, but justifies the procedure in some cases because it holds that there are

implied exceptions in the Old Law regarding the sanctity of human life which have not been countered in the New Testament.

Clearly there is considerable scope for discussion of this very important topic, and it is hoped that readers will enter into this by sending their letters to the Editor. It is an opportunity for each to express an opinion and to indicate that their views are of value and worth consideration.

Tell the Public?

It is interesting to notice that the controversy of whether to tell the patient about his cancer or not has been resurrected after only a very short silence (extensive correspondence followed the article in the B.M.J. by Jean Aitken-Swan and E. A. Easson on March 21st). The pros and cons for both points of view have been aired often enough for us to draw the conclusion that no rules can be laid down, and each case must be judged according to its individual merits.

The difference about the present controversy is that it has been brought to the notice of the public, and has been discussed in the national press. Publicity of this kind cannot conceivably do any good and more probably does considerable harm. "Cancer education" may have some value, but to discuss in public whether or not people should be told, can only fill every mind with the terrible fear that no matter what the truth is, they will never know it, and nothing is worse than to live under a pall of uncertainty. Surely such problems should be restricted to the professional journals, which can and do give ample coverage to this kind of problem.

Fifty Years Ago

The army features large in this edition of the Journal. The Editor urges all freshmen to join the O.T.C. and refers them to an article by one of the officers on the first summer camp held by the University of London O.T.C. on Salisbury Plain. A brief computation made from the data given reveals that the Medical unit did 5½ hours drill per day including half an hour before breakfast. One doubts if this did much to encourage prospective members of the Corps! Far more attractive is another notice which recommends qualified men to serve with the R.A.M.C. Special Officers Reserve:

. . . "conditions are easy, the service voluntary and the officer can resign whenever he settles down, and finds that he cannot continue in the Reserve."

It is, however, noteworthy that at this date the authorities were anxious to have "trained officers to depend upon in the next war" and to avoid the situation in the Boer War when untrained civilians had to be enlisted.

New methods of treatment at Bart's had recently been much discussed in the "half-penny press" and the Hospital was inundated with patients wishing to try the new electrical treatment for rheumatoid arthritis. The use of bee stings in some of our wards for the treatment of the same condition had apparently produced a somewhat extravagant cartoon in one of the cheaper papers.

From *"The Battle of Furunculus":*

"The septic hosts of cocci
Advanced in serried ranks,
They marched upon the Blood Stream
And camped upon its banks:
Forth flew the watchful blood-cells
Crying in wild turmoil:
'Staphylococcus Aureus
Has come and raised a boil!'"

Abernethian Society

The first meeting of the session held on 15th October introduced three very distinguished men—Dr. Melrose, Mr. Bentall and Mr. Cleland, whose recent trip to Russia to demonstrate the technique of open-heart surgery was an outstanding success. It was interesting to hear of the decreasing tension within the nation; the group was invited to the May Day celebrations held within the Kremlin, and (more remarkable still) allowed to take photographs—which were included in the many slides shown to the audience; even the rule which does not allow photographs of dinner parties at which vodka bottles are to be seen, was relaxed.

Impressions of Russian medicine were very enlightening. Research is in many ways very progressive, though apparently not always directed in the right direction, for example, in the grafting of animal's own limbs after they have been amputated. However, the development of machines for performing surgical operations seems remarkable, and demonstration to the group of five major abdominal operations on dogs,

completed in 25 minutes seemed almost beyond a reality. As for the practice of medicine itself, superspecialism seemed to be the keynote, and while one man may listen to the heart, another deals with the E.C.G., and so on. Nursing, as known here in England, seemed to be entirely absent, and the house-surgeon performed many of the tasks which would here be the work of nurses; the absence of meticulous post-operative care made one wonder just how successful open-heart surgery would prove to be.

It was certainly interesting and to their credit that the idea of extracorporeal circulation came from a Russian as early as 1925.

Congress of Haematology

The Seventh European Congress of Haematology convened on the 8th September at Bedford College. In this delightful setting, approximately three hundred and fifty papers were read in the five days. St. Bartholomew's was extremely well represented, both among the contributors and the delegates. In all, over a thousand members attended the Congress. Unfortunately, however, few appeared able to travel from Eastern Europe. We were pleased to welcome among the distinguished visitors from overseas, Professors Dameshek, Finch, Owren and Heilmeyer and Doctors Dausset, Di Guglielmo, Mathé and Bernard.

All branches of Haematology were represented in the scientific programme. The papers being simultaneously translated into each of the three official languages of the conference and relayed over head phones. We learn, that two thirds of all pregnant women in the third trimester show signs of Folic Acid deficiency, of the development of anti B12 substances, and of the continued failure to find biochemical differences between normal and cancer cells which could be exploited for rational and effective therapy. Bone marrow transplantation both in animals and human beings was discussed. The main difficulty remains the control of the immune reaction evoked by the homograft. A symposium on the clinical use of Anti-haemophilic globulin confirmed the limitation on the use of non-human A.H.G., also due to acquired immunity and revealed a discrepancy between the efficacy of the English and Swedish human preparations.

Genetically determined enzyme defects of red cells are gradually being elucidated, the best established to date being Favism, hypersensitivity to suphonamides, and Hereditary Spherocytosis. The abnormal haemoglobins continue to increase in number and complexity. Considerable progress is being made in their chemical analysis. The great variations possible in the Thalassaemia syndromes were brought to our notice together with their not infrequent occurrence in Britain.

In addition to the scientific meetings, an excellent social programme was arranged receptions being given by the Minister of Health, London University, The Royal Colleges of Physicians and of Surgeons and by the B.M.A. The Ladies' programme included visits to some of the leading London shops, Windsor, and Greenwich, and a Beer and Cheese party held in the Apothecaries Hall, for the succour of many thirsty delegates.

The weekend Air liners were filled. I have no doubt, by relaxing Haematologists dreamily planning further research, after a very enjoyable, stimulating and excellently organised Conference.

J.Q.M.

Transatlantic Visitors

During the months of July, August and September the Hospital was pleased to welcome four visitors from the United States; these were Mr. H. Christiensen and Mr. J. Shaw from Stanford University, Mr. J. Larkin from the University of Minnesota and Mr. S. Tuffle from the University of Pennsylvania. All four are taking advantage of the U.S. system of medical education which allows three months in the final year for research or visiting other universities. Mr. S. Tuffle was here under an exchange scheme, but the other three came over independently. Mr. Christiensen and Mr. Shaw are spending the next three months on the continent and Mr. Christiensen hopes to be back for Christmas. An article by Mr. Christiensen on medical education in the U.S. will be published soon.

★ ★ ★

Rowing

The United Hospitals Rowing Club Winter Regatta is to be held on Wednesday, November 25, at Putney. The Boat Club Dinner will be held in the evening. All support will be most welcome, and those who wish to attend the Dinner are asked to contact the Secretary (W. S. Shand).

Research in the Department of Biochemistry

by Professor A. Wormall

Our research interests are widespread and our main studies can best be subdivided as follows: immunochemistry; zinc and cancer; nitrogen and sulphur mustards; radiobiological studies; and skin biochemistry.

Immunochemical Studies

Full antigens, i.e. foreign substances which, when introduced into the animal body cause the body to produce specific antibodies against them, are usually proteins or contain proteins. Antibodies also are proteins, for it has been established that they are gamma globulins with groups which can specifically react with, and in many cases cause precipitation of, the corresponding antigen. When antibody and antigen react, it is very difficult to study this interaction between two proteins unless at least one of the reactants possesses a suitable label; this may be a fluorescent compound or a radioactive or stable isotope. We have found isotopes most useful in the labelling of antibodies or of protein antigens such as bovine serum albumin or ovalbumin[1, 2, 3, 4]. The radioactive isotopes which we use for this purpose are iodine-131, phosphorus-32, carbon-14 and tritium (hydrogen-3), and using labelled antigens and antibodies we have been able to measure the amounts of antigen and anti-body present in small amounts of serological precipitates. We have also studied the fate of injected labelled antigens, for we want to know what happens to antigens after they have entered the body. We have confirmed that specific antibodies in the blood stream are directly concerned with rapid removal of protein antigens which have entered the blood stream[12], but we want to know more about the subsequent fate of these antigens or antigen-antibody complexes.

We have also found that in the "immunised" rabbits, i.e. those which have received injections of protein antigens, a significant fraction of the antibody present in the body is present in tissues other than blood [13], but the location of these non-circulating antibodies has not yet been fully established.

These immunological investigations have been carried out by Dr. Francis, Dr. Hawkins, and myself, and we are continuing to study, with isotopically labelled antigens, the way in which the body deals with foreign antigens and the mode of action of specific antibodies on these antigens. We are also interested in antibodies to some enzymes (including urease and alcohol and lactic dehydrogenases) for we want to know whether the active centres of the enzymes are also concerned in the specific immunological reactions of these proteins.

Another of our immunochemical interests is complement; — a keystone in the immunity defence system of the body, and the system which Dr. Michael Heidelberger has referred to as 'Immunity intensifier, diagnostic drudge, and chemical curiosity'. Here again, isotopic labels have proved very useful, and Dr. Hawkins is continuing his research, part of which he carried out with Professor Haurowitz at the University of Indiana, on the use of labelled complement for studies on the binding of complement by antigen-antibody complexes. In these experiments, amino acids tagged with carbon-14 or sulphur-35, are injected into guinea pigs and these animals utilise the labelled amino acids to synthesise labelled complement.

Zinc and Cancer

One of our earlier hopes was that it might be possible to find some radioactive substance which could be specifically deposited in tumour tissue. Our object was to obtain specific deposition in tumour tissue of some isotope which would emit radiation which would have a local but not general damaging action. Like other workers in this field, we may have been looking for the impossible, but at least it was an experiment well worth trying. We have found, using as tracer a radioactive isotope of zinc (zinc-65), that the intravenous injection of a zinc dithizone compound into mice leads to the deposition of about twice as much zinc in spontaneous mammary tumours as in the normal mammary tissue, but this difference is too small to be of value for therapeutic radio-logical purposes.

For other reasons, Mr. Tupper, Miss Dennes and I are interested in the 'metabolism' of zinc in normal and pathological tissues. It has been reported by workers in the U.S.A. that the leucocytes from

leukaemic patients contain less zinc than do the leucocytes of normal subjects. We have been engaged for some time in the study of this problem, and we should like to be able to identify the zinc compounds, possibly zinc-enzymes or other types of zinc containing proteins, in human leucocytes.

For these studies it was necessary for us to devise a method for estimating accurately the amount of zinc in small samples of blood and blood cell suspensions, and in collaboration with Dr. I. E. Banks (of our Physics Department), we have developed a method of zinc determination by neutron activation analysis which is admirably suited for this purpose [6]. It renders possible the estimation of the extremely small amount of zinc present in 2 or 3 drops of blood (100-150 mg. of blood) or the leucocytes separated from 4 or 5 ml. of human blood. Amounts as little as one-hundredth of a microgram of zinc can be detected, and accurate estimations can be made of amounts as little as one-tenth of a microgram; it should be remembered that one microgram is one-millionth part of a gram. In this method, we introduce a measured amount of blood or separated leucocytes into a small polythene pill pack. The sample is dried and batches of these pill packs containing blood samples are sent to Harwell. There they put the samples in the atomic pile (usually B.E.P.O.) and irradiate them with neutrons for 28 hours, during which period the zinc in the samples is converted into radioactive isotopes of zinc (mainly zinc-69). Several other radioactive isotopes are produced from sodium and other elements in the sample, and the material coming back to us from Harwell is quite 'hot' in a radiochemical sense.

As I write these lines, we have just received from Harwell, brought by special speedy road transport, a can containing the irradiated blood samples, which we shall now work up for radioactive zinc measurements.

We measure how much zinc-69 is present in each sample and in some similarly irradiated samples of known amounts of zinc salts, and from the results we can calculate the amount of zinc present in the original blood samples sent to Harwell. We expect the amounts to correspond to 1-2 micrograms for whole blood samples (about 0.2 ml.) and 0.2-0.6 microgram for the leucocyte samples (10^7-10^8 leucocytes per sample, or the amount separated from about 4ml. of blood from a normal individual or a leukaemic patient). Obviously this work is tedious, and it will be a long time before we have collected all the data we require. However, we have done sufficient of these determinations to be able to state that all the leukaemic leucocytes we have studied contain less than half as much zinc as do normal human leucocytes.

There is no evidence that this 'deficiency' in the leukaemic leucocytes is due to a deficiency of some zinc compound essential for the metabolism of normal leucocytes, but at least this possibility should be given further consideration. For our investigations we have already enlisted the aid of some of our preclinical students, for we have persuaded them to give small samples of their blood for our determinations of the amount of zinc in their leucocytes, and we hope that this short explanation of the objects of our work will help to explain why we have appealed for normal blood samples. We also require normal samples of human serum for other related investigations.

Some workers in London have reported that in leukaemia the serum contains a relatively large amount of a substance (possibly a histidine-like substance) which can be detected and measured by a 'diazo test', i.e. a reaction with a diazo compound to give a pink colour, which can be measured colorimetrically. We have strong evidence that when zinc is attached to proteins, it is the histidine groups of the latter which are predominantly concerned with the binding of the zinc. Thus, histidine-containing compounds in the serum might obviously play a role in the control of the zinc metabolism of leucocytes, bone marrow and other tissues, and we are now investigating this diazo reaction which has been described by the authors as a serum test for neoplasia.

Skin Biochemistry

In 1950, Dr. MacKenna and I started organising research in skin biochemistry as a joint effort from the Departments of Dermatology and Biochemistry, and this research, in which we have had the help of Dr. V. R. Wheatley and Dr. Barbara Boughton, has attracted considerable attention in the U.S.A. and many other countries. Indeed, such was the interest of the Americans in this work that a few years ago two of their Universities held out very attractive offers to Dr. Wheatley, and ultimately he left us to take up a senior post at the University of

Chicago. Since then, he has moved on to Stanford University, California, to help them to organise research on skin biochemistry. Because of lack of funds, our College has been unable to finance our own research in skin biochemistry, and for the present these researches have had to be stopped.

Many of our present clinical students will probably remember occasions a few years ago when they volunteered to shed their surface skin fat (sebum) for our research, and they might like to know that their valuable co-operation enabled us to collect sufficient material for our chemical investigations and for the carrying out of some preliminary clinical tests. Alas, normal sebum collected from the forearms of medical students did not possess any detectable curative action (nor did squalene or shark liver oil) when applied to the skin of patients suffering from seborrhoeic dermatitis, psoriasis, eczema and certain other skin disorders.

Our first major task was to undertake a full chemical analysis of normal human sebum, and this was successfully accomplished [5,7]. This fatty secretion or excretion contains fats, free fatty acids, waxes, and, as we were surprised to find, an appreciable amount of squalene, an unsaturated hydrocarbon which hitherto had largely been known as a major constituent of some shark liver oils.

Subsequent to our discovery of squalene to the extent of 5-10 per cent in sebum, other investigators (in the U.S.A. and in London at Mill Hill and Hammersmith) studied the metabolic significance of this hydrocarbon and established that it is an important intermediate in the formation of cholesterol in the animal body.

Incidentally, our observation that squalene is a normal constituent of sebum led some American workers to report that it possesses marked depilatory activity. Our experiments did not confirm this observation, but since a depilatory which is a normal constituent of body tissues might have great possibilities in the world of commerce, we took early steps to obtain very considerable supplies of shark liver oil. If necessary, we could have separated the squalene, which accounts for about 40 per cent of some shark liver oils, and have supplied it as a harmless depilatory. Our experiments[7]—with man, rabbits and certain other animals showed, however, that the depilatory action was not greater than that of paraffin oils and of certain commercial hair tonics, so that was the end of that dream.

Using the recently developed method of gas-liquid chromatography devised by James and Martin, we have also been able to study the free fatty acids in very small samples of sebum, with the object of finding whether there is any abnormality in the types of fatty acid secreted in the sebum of patients suffering from acne, seborrhoeic dermatitis, etc. Our investigations have failed to reveal any regular abnormality in sebum composition in these diseases [8, 9]. We also found, using rats as our experimental animals, that the feeding of chocolate and pork fat, foods which are believed to aggravate acne vulgaris, do not cause any alteration in the general composition of the sebum secreted.

Nitrogen Mustard

For the past few years we have been studying the action of nitrogen mustard on proteins and other body constituents, and for these studies we have synthesised nitrogen mustard containing a radioactive isotope (carbon-14 or tritium) or a stable isotope (nitrogen-15). This radiomimetic drug has a marked reactivity towards, and combines with, nucleoproteins and practically all other proteins[10], and our results indicate that after intravenous injection into man and other animals, the drug does not remain long in the blood stream.

Radiobiological Studies

In collaboration with Professor Rotblat, we have found that the exposure of serum to moderately low doses of X-rays and electrons causes a marked destruction of the haemolytic complement of the serum, detectable destruction being observed with diluted serum exposed to doses of 500 rads[14].

We are now studying the action of ionising radiations on proteins, including the enzyme urease. One of our objects is to study the effect of X-rays, etc. on the biologically important SH groups. Dr. Wills is also continuing his studies [11] on the effect of X-rays on the production of peroxides from unsaturated fatty acids, and the effect of these peroxides on SH-enzymes.

References

Reviews, monographs, etc.

1. G. E. FRANCIS, W. MULLIGAN, AND A. WORMALL (1959) "Isotopic tracers", 2nd Ed. London: Athlone Press.
2. G. E. FRANCIS (1953). "The use of

isotopes in immunology." *Biochem. Soc. Sym.*, No. 10, p. 49.
3. A. WORMALL (1948). "Contributions of chemistry to the problems of immunology." *Brit. med. Bull.*, 5, 333.
4. A WORMALL (1955). "The use of radioactive isotopes in immunology." *Brit. J. Radiol.*, 28, 33.
5. V. R. Wheatley (1953). "Some aspects of the nature and function of sebum." *Bart's Hosp., J.*, 57, 5.

Some other publications

6. T. E. BANKS, R. TUPPER, E. M. A. WHITE AND A. WORMALL 1959). "Micro-determination of zinc in in blood and other tissues by neutron activation analysis." *Internat. J. Appl. Rad. Isotopes*, 4, 221.
7. B. BOUGHTON, R. M. B. MACKENNA, V. R. WHEATLEY AND A. WORMALL (1957). "Studies on Sebum. 8. Observations on the squalene and cholesterol content and the possible functions of squalene in human sebum." *Biochem. J.*, 66, 32.
8. B. BOUGHTON, R. M. B. MACKENNA, V. R. WHEATLEY AND A. WORMALL (1959). "Fatty acid composition of surface skin fat (sebum) in acne vulgaris and seborrhoeic dermatitis." *J. Invest. Dermatol.*, 33, 57.
9. B. BOUGHTON AND V. R. WHEATLEY (1959). "The fatty acid composition of skin surface fat (sebum) of normal human subjects." *J. Invest. Dermatol.*, 33, 49.
10. V. C. E. BURNOP, G. E. FRANCIS, D. E. RICHARDS AND A. WORMALL (1957). "Studies with 15N-labelled nitrogen mustards. The combination of di-2-(chloroethyl) methylamine with proteins." *Biochem. J.*, 66, 504.
11. M. E. CLUBB AND E. D. WILLS (1959). "The effect of irradiation on unsaturated fatty acids and sulphydryl enzymes." *Biochem. J.*, 71, 16P.
12. G. E. FRANCIS, J. D. HAWKINS AND A. WORMALL (1957). "The use of radioactive isotopes in immunological reactions. 10. The fate of some intravenously injected native proteins in normal and immune rabbits." *Biochem. J.*, 65, 560.
13. G. E. FRANCIS AND J. D. HAWKINS (1958). "The use or radioactive isotopes in immunological investigations. 13. The role of leucocytes and non-plasma antibody in the removal of antigenic proteins from the blood stream of immunized rabbits." *Biochem. J.*, 69, 287.
14. P. J. HANDOLL, J. ROTBLAT, E. D. WILLS AND A. WORMALL (1956). "Effects of ionizing radiations on serum complement and enzymes." *Nature*, 178, 307.

FORTHCOMING EVENTS

General Practice

On Thursday, November 26, at 12 noon, Dr. Abercrombie will give the next lecture on "General Practice".

"Ruddigore"

The Gilbert and Sullivan Society are to give their annual performance, under the direction of C. A. Hood, at the Gresham Hall on Friday, November 20.

United Hospitals Orchestra

The Orchestra will give its Christmas concert at the Duke's Hall, Royal Academy of Music (near Baker St. Station) on Saturday, December 5.

Rugger Club Ball

The Annual Ball will be held at College Hall, Charterhouse Square, on Friday, December 4, from 9 p.m. to 2 a.m. Tickets (limited to 120 couples), may be obtained from any member of the Club committee.

Film Society

Continuing the policy of variety, the Society presents "I Vitelloni" (The Spivs), on Monday, 23rd November. Directed by Frederico Fellini, this is an absorbing study of five good-for-nothing young men, living in a small provincial town, whose energy is spent in the pursuit of idleness. The lazy, worthless and utterly contemptible characteristics of the five drones are brilliantly observed, and may give rise to uncomfortable introspection in some members of the audience.

This essay in provincial villainy gained an award at the Venice Film Festival in 1954.

On Monday 7th December, an old favourite will receive a double showing (at 5.30 p.m. and at 8.30 p.m.). This is "Kind Hearts and Coronets" with Dennis Price as the ingenious Mazzini, murdering a series of eight relatives, all brilliantly acted by Alec Guinness, to achieve his goal of the Dukedom of Chalfont. Valerie Hobson takes the part of Mazzini's wife and Joan Greenwood, with her inimitable husky voice, his mistress.

This is the last show of the Autumn Session, but another series of five films is being arranged for the Winter Session, and these will be announced in due course.

A.P.

* * *

CALENDAR

NOVEMBER

Wed. 25 Soccer v. London Hospital (H).
Sat. 28—On duty: Dr. E. R. Cullinan.
Mr. J. P. Hosford.
Mr. C. Langton Hewer.
Rugger v. U.S. Chatham (A).
Soccer: A.F.A. Junior Cup.
Hockey v. U.C.H. (A).

DECEMBER

Wed. 2—Soccer v. St. Mary's Hospital.
Sat. 5—On duty: Medical and Surgical Units.
Mr. G. H. Ellis.
Rugger v. Esher (A).
Soccer: United Hospitals Cup, 2nd round.
Hockey v. Lloyd's Bank (A).
Mon. 7—Film Society: "Kind Hearts and Coronets".
Wed. 9—Soccer v. Charing Cross Hospital (A).
Sat. 12—On duty: Dr. R. Bodley Scott.
Mr. A. H. Hunt.
Mr. F. T. Evans.
Rugger v. Nottingham (H).
Soccer: A.F.A. Junior Cup.
Hockey v. Westminster Bank (H).
Sat. 19—On duty: Dr. A. W. Spence.
Mr. C. Naunton Morgan.
Mr. R. A. Bowen.
Rugger v. Stroud (H).

ANNOUNCEMENTS

Engagements

BLAIR—BRANFOOT.—A marriage has been arranged and will take place shortly between Dr. A. T. Blair and Dulcie Branfoot.

NERNEY—BUNN.—The engagement is announced between Dr. John Michael Nerney and Mary Patricia Russell Bunn.

Marriage

ABERCROMBIE—KIRBY.—On 15th August, George Forbes Abercrombie, B.A., B.Ch. (Cantab.) to Jennifer Elizabeth Dormer Kirby.

Births

BEARD.—On 2nd September, at Singapore, to Jane, wife of Dr. Richard Beard, a son.

BIRT.—On August 25, to Barbara and Michael Birt, a son (Jonathan Paul).

FABER.—On 5th August, to Susan and Dr. Vernon Faber, a daughter (Ruth Grey).

HAYES.—On 6th August, to Susan, wife of Dr. Martin Hayes, a son (Justin).

KIELTY.—On 13th September, to Patricia and Dr. Michael Kielty, a son (Michael John).

TAYLOR.—On 1st August, to Andree, wife of Dr. W. Norman Taylor, a son (Julian Quentin), a brother for Howard, Cherry, Anthea and Charmain.

THOMAS.—On August 7, to Barbara and Dr. Geoffrey Thomas, a son (William Geoffrey), a brother for Elizabeth and Amanda.

Deaths

BARNES.—On 31st August, Dr. Howell Wood Barnes. Qualified 1911.

HAIGH.—On June 18, Dr. Bernard Haigh, aged 80. Qualified 1908.

NEILL.—On 11th August, Dr. Eric James Neill, aged 55. Qualified 1929.

SHUTER.—On 28th August, Dr. George Percy Shuter. Qualified 1893.

STOKES.—On 9th July, Dr. Kenneth Reginald Stokes, aged 58. Qualified 1926.

* * *

OBITUARY

Eric James Neill died at Newhaven on August 11, aged 55. He was one of four sons of two doctors, the Rev. Dr. Charles Neill and Dr. Margaret Neill, *nee* Munro. His father and uncle, Balfour Neill, were Caius and Bart's men, but his father—having qualified—left Medicine and Eric grew up in the atmosphere of parish work among working people. He stayed happiest in this throughout his life, so that when his old chief, Wilfred Shaw, told him later how much better he could have done in a London practice he said: "You know, I grew up in a parish and these working people are what I want". His education was at Dean Close School and then, when his father moved, St. Paul's, where he won a classical scholarship to Caius. He played in University Hockey trials and took his Honours Classics Degree, but realised that schoolmastering was not his life and went to his father's hospital. There he qualified quickly, played hockey for Bart's and the United Hospitals, did his House job under Wilfred Shaw, and met his wife. After a short time in Ipswich with her, he settled in Newhaven and worked uninterruptedly for 28 years, prevented only by war, illness and death.

At Munich he volunteered for the R.N.V.R. and in 1939 was called up. For the greater part of six years he was at sea with the Fleet Air Arm. To his sensitive nature this was a painful service, long close contact making it harder to bear the inevitable end of many of his airmen. He was never so fully fit afterwards, but stuck closely to his beloved practice, even to the extent of shortening treatment of a disc lesion by almost compelling his neuro-surgeon to do a laminectomy. He worked arduously, for, with his busy practice, he was also Admiralty Surgeon and Agent and Treasury Medical Officer, and it was his duty to meet cross-Channel boats.

He served on Divisional B.M.A. and other Committees and used his great knowledge of local conditions and people forcefully on the Urban District Council. Indeed, he disliked leaving Newhaven and so confined his recreations to tennis and captaincy of the Town Hockey side. His only outside appointment was his London Masonic Lodge, and he passed through its Chair. He loved caravanning holidays, and, most of all, his home. Here, with his wife—who shared his life very fully—he was always waiting to help his people, and his father's ideals were strong in him. Very few have so warm or determined hearts. He brought the resources of British Public School life, Cambridge and Bart's voluntarily to his devoted working people, with no show at all. Deepest sympathy goes to his widow and son. His practice is taken over by his companion in war and partner in peacetime years since, Dr. Ralph Alexander.

W.A.B.

* * *

Change of Address

Dr. R. A. Roxburgh,
63, Southway,
N.W.11.

Dr. Edward Savage,
12, Dunraven House,
Castle Court,
Westgate Street,
Cardiff.
Tel. 26970.

Dr. G. C. R. Morris,
Terrysfield,
Downe,
Kent.
Tel. Biggin Hill 54.

Dr. W. W. Wells,
5 Heol-y-Felin,
Rhiwbina,
Cardiff,
S. Wales.

* * *

Seriously ?

That Western research workers are willing to credit their Russian colleagues with some notable contributions in the study of fats and heart disease may be so, but the reverse is not the case. Professor I. Gurevitch writing in *Klinicheskaya Meditsina* decided that the campaign to reduce fats in the diet is a capitalist plot—"advantageous to the ruling classes, who are at present engaged in lowering the living standard of the masses, in lowering their wages and in raising the price of food and particularly of fat. The masses in capitalist countries suffer from a shortage and not from an excess of fat."

Reported in Time, *March 30th, 1959*

HISTORICAL DIAGNOSIS

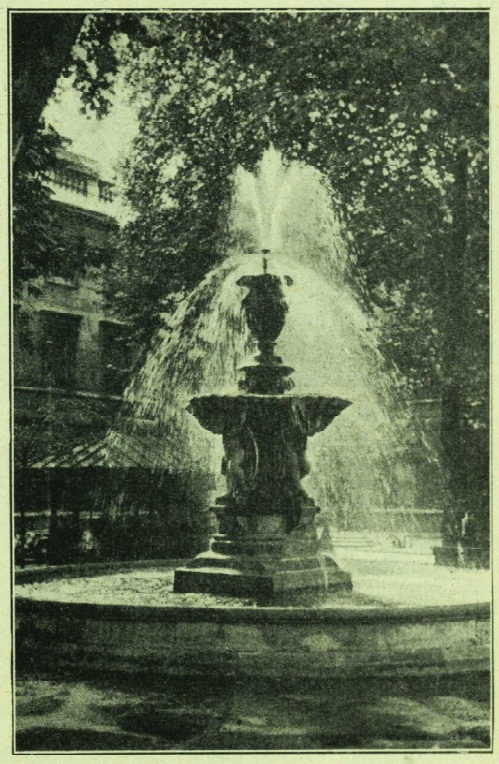
Flavius Josephus, one-time Roman Governor of Galilee, was not a Medical man, but in his works can be found a description of the last illness of Herod the Great.

"From then on the sickness spread through his entire body, accompanied by a variety of painful symptoms. He had a slight fever, an unbearable itching all over his body, constant pains in the lower bowel, swellings on the feet as in dopsy, inflammation of the abdomen and mortification of the genitals, producing worms; as well as difficulty in breathing when lying down, and spasms in all his limbs.

". . . But though he was wrestling with so many disorders he hung on to life, hoped for recovery, and planned his own treatment. . . . The Doctors there decided to warm his whole body with hot oil by lowering him into a full bath; but he fainted and turned up his eyes as if dead. He recovered from the effects of his immersion, only to die five days later."

Suggestions of possible diagnoses would be very welcome. Further "Historical Diagnoses" in this series will be published soon.

A.M.W.



Examinations Results

UNIVERSITY OF OXFORD

2nd B.M. Examination

General Pathology & Bacteriology:
Warr, A. C.
Forsenic Medicine & Public Health:
Greaves, C. W. K. H.
Williams, C.
Lane, D. J.
Millward, J.
Special & Clinical Pathology:
Greaves, C. W. K. H.
Williams, C.
Lane, D. J.
Millward, J.

CONJOINT BOARD

First Examination

Pharmacology:
Hijazi, H. K.
Kielty, P. A. M.
Craggs, J. C.
Pemberton, M. J.
Chawner, J. M.
Childe, M. W.
Chambers, R. J.
Shaw, A. B.

L.M.S.S.A.

The following have completed the Final Examination for the Diploma:
Bowles, K. R.
Hamilton, S. G. I.

JOURNAL COVER : COMPETITION

The Publication Committee intend to offer a prize of **five guineas** *for the winning design for a new cover for the Journal.*

Designs may incorporate the whole cover page or simply replace the present design. They should be accurately drawn in black ink on white paper of the correct size.

Entries should be received by the Editor before November 30th.

The Centenary of the Fountain, 1859-1959

THE STORY OF ITS CONCEPTION

by Miss M. V. Stokes
(Assistant Archivist)

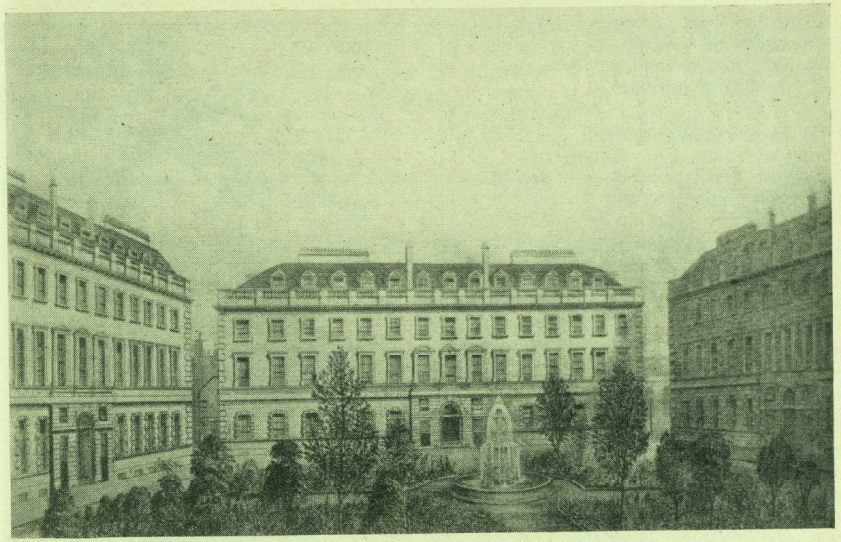
What would Bart's do without the fountain? This thought entered my mind one day as I crossed the shade dappled Square and passed the chattering groups round the Fountain. It is almost impossible to imagine the Hospital without the fountain, indeed it has stood there for a hundred years. It may seem strange that Gibbs' original designs for the Hospital quadrangle did not provide for such a feature, but had a fountain been suggested at that time the idea would probably have been rejected as an unnecessary luxury. As it was the Hospital's finances were severely strained especially after Treasurer Tuft absconded with £4,000 in 1760.

From 1730, on the various engravings of plans and elevations issued in the campaign to raise subscriptions for the new buildings show an open quadrangle but the space was not cleared for over thirty years. Demolition of the old Hospital buildings, shops and houses had only been piecemeal, as the site of each wing was cleared in turn, and buildings had been left in the centre. However, in February 1766, the Governors resolved [1] that as the fourth wing had been furnished and as the houses and shops in the middle were in a ruinous condition, they should be taken down. They were divided into lots and in October [2] they were auctioned, the purchasers being given until Christmas to demolish and to cart away the material. In the following June [3] an agreement was made with William Staines, paviour: he was to pave the sides of the Square with sound Ealing edge pavement, 9 ft. 6 in. wide, with a kerb of Cornwall moor stone and with 2 ft. of pebble laid in gravel, in front of the kerb. He was to keep it all in repair for 10 years but he would not be chargeable for damage by water-pipes. Earlier the Governors [4] had given instructions that the "ancient well, formerly in Well Yard, now laid into the said area (the Square) of the Hospital be cleared and made fit for use and that a pump be put down in some convenient place . . . to be supplied with water from the same well". Nothing seems to have been done about this for there are no more references to it and none of the eighteenth century prints shew a pump. The earliest, printed for H. Parker after 1752 has people of quality admiring the new buildings, two blue coat boys, several cripples and a beadle with his staff but no well or pump. There is a reference of 1809 [5] to a pump in front of the Men's House but no plan or view shews it.

Later prints, one from a drawing by Neale, published in 1815 and a later one from a sketch by Thomas Shepherd do include a tubby pump surrounded by railings. This was the one constructed in 1809. The supply of water from the New River Company had proved inadequate for the Hospital's increasing needs and the Governors had ordered the Surveyor, James Hall, to open and examine the old wells of the Hospital [6]. In his report of 20th January 1809 [7] he stated that he had been unable to find either the old well, which was supposed formerly to have supplied the pump to the Men's House, or the well once in the centre of the Well Yard. He went on to say that he had learnt that springs were near the surface for there had been difficulty over flooding of the foundations for Gibbs' buildings. The Governors decided that a well should be dug in the centre of the Square [8]. It was this well, with the pumping gear over it, that is seen in the early nineteenth century prints, though its position seems to vary with the artist's whim.

According to the Charity Commissioners Report of 1837 each wing had a tank containing 1,800 to 2,000 gallons supplied by the steam engine in the Square; this supplemented the amount from New River Company. The well in the Square was still providing 13,000 gallons out of a daily total of 40,478 gallons in 1854, but the Surveyor, Philip C. Hardwick, the third of his family to serve the Hospital, suggested that when the New River Company had completed its new works the well supply might be discontinued [9]. On 17th December, 1857 [10], Hardwick recommended that as the well had been disused for some time, the gear of the pump should be sold. The Governors approved this step during the next month [11], but it was not until January 1859, that the House Committee asked the Treasurer and the Surveyor to see that the Square was planted out [12], and nine more months passed before the idea of a fountain was considered by this Committee [13], "several of the Governors and Medical

Staff having expressed a desire to see one placed there". In his report [14], Hardwick estimated that the cost of construction would be about £220, and the basin with its pipes £40. He also submitted a design of a group of figures which would cost £95. He pointed out that it would be necessary to carry the jet high enough so that it could be seen over the shrubs and that the cost of a figure group would not be very much more than any "nearly architectural form



Drawing of the Square in 1870

of the same height". On 11th October, 1859 [15] the Governors resolved "that a fountain be erected in the Hospital quadrangle in conformity with the design of the Surveyor and according to his Report". There is no further reference to the subject in the Governors' Minutes, either of the House Committee or of the Treasurer and Almoners. Hardwick apparently just got on with the work; however, one part of his scheme does not seem to have been adopted: he had recommended that the fountain should be fed from tanks placed in the roof above the Great Hall, but there is no evidence, written or material, that this was ever done, and it is probable that the fountain has always been supplied direct from the mains.

A drawing of 1870 shows the Fountain surrounded by young plane trees and shrubs, the latter were cleared and replaced by shelters in 1895 [15]. Since then there have been no major changes and the fountain has continued to bring pleasure to succeeding generations of staff, students and patients.

References

1. Ha1/13, p. 417, 14th February 1766.
2. Ha1/13, p. 449, 22nd October, 1766.
3. Ha1/13, p. 491, 25th June, 1767.
4. Ha1/13, p. 475, 20th February, 1767.
5. Hc9/2, p. 214
6. Ha1/16, p. 228, 1st September, 1808.
7. Hc9/2, p. 214.
8. Ha1/16, p. 290.
9. Hc10/1, p. 148.
10. Hc10/1, p. 176.
11. Ha1/21, p. 325.
12. Ha1/21, p. 411.
13. Ha1/21, p. 475.
14. Hc10/1, p. 198.
15. Ha1/21, p. 480.

A Hundred Years Ago Today . . .

A CELEBRATION OF THE FOUNTAIN IN VERSE

by R. B. PRICE

A hundred years ago today
This old familiar Square
Was arid, parched and waterless;
Its aspect grim and bare.

The ancient mediaeval well,
From which the friars drank,
Was lost, and none could now locate
That long forgotten tank.

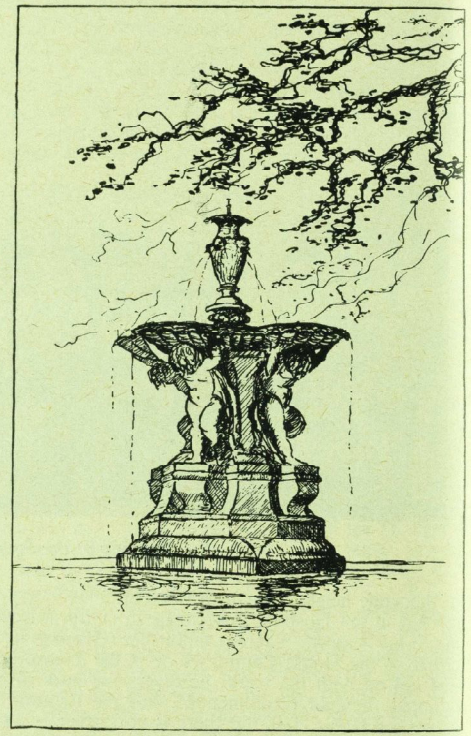
As once in Sinai's Wilderness,
When Moses smote the rock
And cooling streams came gushing forth
To cheer his thirsty flock,

So in this City Wilderness,
This waste of bricks and mortar,
From thirsty St. Bartholomew's
Arose the cry for water.

Our patriarchs inclined their ear.
Like Moses on the mountain,
And just one hundred years ago
Decreed this noble Fountain.

It's grateful form, its limpid pool,
Have quite transformed our Square.
And grateful generations since
Have known and loved it there.

The students still assemble here.
And round the Fountain's rim
Old reminiscences are told
And stories gay or grim.



B. C. King.

A freshman mingling with the throng
May overhear perhaps
How one late reveller once swam round
Submerged for several laps:

Or still with disrespectful glee
The tale may be rehearsed
How one prospective V.I.P.
Was forcibly immersed.

A hundred years of history.
Both trivial and great,
Enacted round the Fountain,
Today we celebrate.

And still it stands, symbolical
Of all the healing arts,
A source of life and energy.
The very heart of Bart's!

Long may it play, and long adorn
This well-remembered Square;
A bond, a symbol, and a shrine
To Bart's men everywhere!

Fons Et Origo

All places have their presiding spirit. That of Bart's is definite and recognisable, but an analysis of its origin has seldom been attempted. This short paper may perhaps stimulate further and deeper research into the matter. Rome had its wolf, Venice its lion and Athens its owl.

Some years ago the fountain lay empty for some weeks for cleaning or for repair, and while in its dry state it provided a short cut for a ward cat, whose habit it had been to visit a lady friend in the opposite block, previously circumventing the basin of water. In due time the fountain bowl was refilled, unknown to puss, in whom, in the meantime, Cupid had lit such a flame of desire that, as one evening fell, he issued from his ward, sped at full gallop over the square, and leaped high over the verge of the basin to find, too late, that his landing place was no longer solid ground.

A splash and a frenzied flurry preceded the emergence of a soaked, shocked and chastened Tom. History had it that thence forward his reformation was marked by modesty, courtesy, regard for others and, in short, by all those qualities which mark the Bart's man. Furthermore, his new birth was noticed, and recorded, by an acute observer.

Personally, I believe the facts to be true but the deduction false, for surely there were typically courteous and unselfish Bart's men before twenty years ago when the event occurred. Be this as it may there is no doubt that some ameliorating influence does issue from our fountain.

Not for nothing have certain persons been thrown fully clothed into its basin. Arrogance has in some been the cause, failure to wash in some, and in a few an unpleasant type of incompatability. I have witnessed the phenomenon several times, as a student and as a member of the staff. One afternoon at nearly half past one I was waiting, as a clerk, to attend my chief upon his round. The square was well populated and calm until from one corner there emerged a mobile group. A kicking, writhing and twisting form was being carried horizontally, by figures who gave at his every lunge but did not loose their grip, towards the fountain.

All in the square surveyed the scene with interest or with amusement, except the members of the visiting staff. These, at a moment's notice summoned one of the most valuable characteristics of the Briton. They saw but they appeared not to survey. Moreover, without seeming to walk they were next visible at a tactful distance from the scene of execution.

The climax of this was preceded by a tentative swing or two on the part of the carriers, who then, with a final hard heave, precipitated the subject up into the air whence he fell with a resounding splash, to emerge a wet and miserable object, but it is to be believed chastened and improved by his immersion.

In latter days the gentler sex has joined our ranks. The ladies were quick to note the virtue of our fountain water. They won the inter-hospital hockey cup twice running, and the winning team was photographed, in hockey clothes, in the square. After this ceremony was finished the captain was seized by her hand-maids, and was cast, an apprehensive but not too unwilling victim, and at any rate, suitably garbed, into the watery arms of Fons. Since this first happened the cup has remained in our hands. May similar sacrifices ensure that this will continue.

My old friend 'Doc' Fisher, a one-time Cambridge stroke, during his last Christmas at Bart's, inspired perhaps by Bacchus, leaped into the basin one night and swam round it thrice, fully clothed. No wonder that later he returned to his native Skipton and became the much loved doyen of medicine in the town among the Yorkshire moors.

During the First World War, Girling Ball was air-raid officer, and one night the hospitaller, a rather nervous cleric, came to him from his bed over the Henry the Eighth Gate with a tale of continuous although distant bombs. Ball afterward told the story. "The parson came in the middle of the night and woke me from the first good sleep I had had for days. He said he heard bombs. I dressed and went out into Smithfield. "Bombs!" I said, "Those aren't bombs, they're porters dropping carcases in the meat market." Silly ass of a parson. Put 'im in the fountain. Proper place for parsons!" Ball too had hopes of the beneficial influence.

So, in future, may our fountain continue long to bless and mould us and our successors. Even if the benediction is only administered by way of a cold gluteal kiss as we sit on its limestone rim.

GEOFFREY BOURNE.

The Ethical Aspects of Therapeutic Abortion

I. AN ANGLICAN VIEW

by A Bart's Surgeon

*" Every moral position is dogmatic and ultimately unprovable."**

General Principles

Moral standards are of immense importance in every community and may well determine the destiny of a nation. They may be derived from religious convictions or may have evolved and changed under stress or experience over many hundreds of years. But whatever their ultimate origin, or their present dynamics may be, there is no doubting the truth of the initial quotation. Every moral position is dogmatic. The dogma may be derived from a God-given revelation or from human excogitation. This inevitability of dogmatic foundation, makes it rather easier for the Christian to put his viewpoint, which, by its very nature, is bound to stress its dogmatic origin founded in revelation.

At this point two questions arise and demand an immediate answer:

(1) Is it incumbent on the Christian, when there is no explicit guidance in his religious teaching, to concern himself to define a Christian attitude to the problem under consideration? The early Christians were called men of the Way for the simple reason that they believed that Christianity was a way of life based on an inward relationship with an unseen Master. This way of life permeated all that they did and set new and exacting standards in every department of life. In particular, the earliest Christian writings are full of references to the need for bringing all personal, family and social relationships into conformity with the moral standards inseparable from a desire to please their new Master.

(2) How can the Christian decide his attitude and set his standard in a matter of human behaviour which is not explicitly covered by any precise set of rules in his body of doctrine? The exact way that this question is answered will depend on the theological position and the Churchmanship of the individual Christian, and this article must be considered as the personal approach to the problem of an individual Anglican. Great emphasis was laid at the Reformation on the right and liberty of individual and private judgement. The 39 articles of Religion lay it down that the Scriptures are the ultimate authority for the establishment of doctrine and "instruction of manners". The Westminster confession similarly states that the Scriptures are our final authority in all matters of faith and conduct. How can the Scriptures help us today in this modern problem? It is certainly not specifically referred to. The Old Testament lays down much detailed regulation of many similar human problems of behaviour but this one is scarcely touched upon. The New Testament tends to lay down great guiding principles and stresses the over-riding importance of sincerity and motives and the much greater importance of "inwardness" in religion as opposed to the externalism rife in the lifetime of Jesus. We must refer to these principles and see how they can be applied to this matter in a way which is consistent with the Scriptures as a whole.

Therapeutic Abortion

It is well for us to see first what possible disadvantages and dangers that abortion in general may give rise to, and what prohibition of moral law it may transgress, before we consider the nicer points of therapeutic abortion.

Deliberately induced abortion involves a deliberate killing of the foetus which has attained an identity and is, potentially at least, a human being. (This takes no note of the prime motives in initiating the abortion.) It can therefore be regarded as a taking of human life. Side by side with this, abortion deprives a developing human of its right to existence and development. It can also be charged against abortion that it may cause danger to the health and life of the mother, and it also is open to the charge of assisting depopulation, or of failing to assist maintenance or increase of population.

There is little doubt that the main issue is that it may constitute an unjustified or unjustifiable assault on the cardinal principle of the sanctity of life.

These are some, at least, of the points which the moralist must examine and endeavour to establish or exclude their validity.

Sanctity of life is a widely held ethic

* Glanville Williams in "The Sanctity of Life and the Criminal Law" (Faber and Faber) p. 182.

throughout the world and this is, of course, not limited to those embracing the Christian faith or influenced by it. Christian theologians have shared a difficulty common to other thinking people that no one can know for certain at what point in its life cycle the fertilised ovum becomes truly a human being, in particular at what point the spiritual component can be said to "take up residence". To those who are convinced that man is no more than a vast bio-chemical synthesis, this naturally presents no problem. But for all men and women who think, or hope, or who are certain in their own minds that at death some spiritual identity quits the body, logic and reason demand that at some point a spiritual factor must have entered that body. And so it is, for a very great number of human beings, a matter of importance. If we are to be on the safe side, we surely should assume that from the moment of conception, a new individual exists—a spiritual being which, if it is allowed to develop without interference, may grow into a great man or woman capable of making an immense contribution to human progress and Divine pleasure. It would seem therefore that an act designed to nullify this possibility must be considered as an assault on the sanctity of life. What specific direction does the Christian acknowledge which can be invoked at this point? There is no doubt that Old and New Testaments command that man should not kill. In the Old Testament, when this is first laid down in the codified law of Moses, (a similar prohibition is recorded much earlier in Old Testament history), it must be apparent that exceptions to this simple law are intended. Capital punishment is advocated and war is most certainly not outlawed. In the New Testament there is no explicit countermanding of these exceptions. Some have read into the Sermon on the Mount an implicit denunciation of all forms of force and resistance, which would automatically exclude the punishment of the criminal (including involuntary imprisonment) and all participation in war. But many others who consider this special teaching of Jesus concerning the personal attitude of individual Christians to maltreatment by others, in balance with His other teaching, do not accept this interpretation. This latter group hold that the Old Testament teaching in this respect is not changed by the more advanced teaching of Jesus and with this the writer agrees. And so it can reasonably be held on Christian grounds that there are carefully guarded exceptions to the important principle that life may never be taken. If this point be conceded then the Christian must be willing to face the possibility of an intervention to initiate an abortion. It will be of vital importance to scrutinise the indications most carefully but first it must be pointed out that there are those who concede this point who yet are unwilling to consider therapeutic abortion as being permissible for a consistent Christian—be it the mother or the medical practitioner who is concerned. What are the reasons for this? The Roman view must be briefly mentioned here but will be dealt with by another contributor in another article. It is taught that the foetus has the same right to life as the mother. To this it may be replied that the mother has the same right as the foetus and there is the inevitability in certain circumstances of an inescapable moral choice. Side by side with this view the Roman Catholic believes in the absolute necessity of baptism of the infant (or even foetus) to save it from eternal punishment for original sin. The Anglican may adhere to the doctrine of original sin but is in no wise comitted to this view of the necessity of baptism of the foetus or infant to ensure its participation in the benefits of the Redemption.

Therefore it would seem to this writer that it is not inconsistent with a complete loyalty to Christian teaching for a Christian to participate in abortion for therapeutic reasons. He is making a moral choice between sacrificing an actual life with conscious enjoyment of it and with, perhaps, very heavy responsibilities, and the sacrifice of a life which only has the potentiality of these things It is a choice he has not sought but which he endeavours to answer in a way which takes all relevant matters into consideration. This choice pays due regard to the prime doctrine of the sanctity of life and only dares to set it aside for genuine reason of real weight within the permitted exception. The motive must be to save the mother's life rather than to destroy the foetal life for convenience.

The scope of what is implied by the word "therapeutic" must be carefully scrutinised. The most obviously valid reason for undertaking this treatment would be to save the mother from death or from a significant shortening of her life. This is the primary somatic reason but its frequency has lessened with the years and with progress in treatment

and knowledge of prognosis. Some would extend this to include varying degrees of serious disability. The mother's mental condition and the likelihood of serious mental breakdown is another important factor for consideration—one which is very difficult to assess. There are those who would introduce the eugenic indication and the socio-economic indication and finally those who would make abortion a matter of choice for wife and husband. The writer has neither space nor inclination to indicate where the line might be drawn but for the Christian it must certainly be clearly drawn from principle and not for convenience. Here is the place and this is the time to examine with sincerity the motives which lie behind the consideration of an individual case in which therapeutic abortion is being considered. Thus, the Christian knows that to take life or to initiate the suppression of it is for him, forbidden, apart from the jealously guarded exceptions. Is the case concerned a real exception? Is there a valid threat to maternal life or healthful ability to face the future as wife and mother. The motive of mother and practitioner, and their sincerity of purpose must be the arbiter in each individual decision.

II. THE JEWISH VIEW

by D. Weitzman, M.D., M.R.C.P.

In the Jewish ethical view the interests of the mother are generally considered to have priority over those of her unborn child. As Jacobs (1951) puts it, although it is axiomatic in Jewish law that one life may not be deliberately sacrificed in order that another be saved, an unborn child (whose viability has yet to be proven) is not regarded as a "life" in the same sense as the manifest life of its mother. The first authoritative pronouncement on the subject, dealing with obstructed labour, appears in the Talmud, a Rabbinical code of laws formulated between the second and fourth centuries of the Christian Era. This lays down that "if a woman is in hard travail, one cuts up the child in her womb and brings it forth member by member because her life comes before the life of the child. But, if the greater part has proceeded forth, one may not touch it; because one may not set aside one person's life for that of another." Elsewhere in the Talmud the foetus is regarded as an integral part of the mother: and embryotomy is equated with amputation of a limb, when necessary for the preservation of the owner's life.

The fuller implications and application of the Talmudic doctrine have been discussed over the centuries by many religious and medical authorities. Recently Jakobovits (1955) has carefully analysed these arguments, and sums them up as follows.

1. Up to the onset of labour, the foetus is regarded as an organic part of the mother, and there is no legal provision for the protection of its life, according to the concensus of rabbinic opinion. The artificial termination of pregnancy is however strongly condemned on moral grounds *unless justified for medical reasons.*

2. During labour and until the head or the greater part of the body is born, the child's life is of inferior value: and it is wrong to let the mother die if she could be saved by the death of the child.

3. Once the head or the greater part of the body has been born, the child's life is of equal status with its mother's; but, since viability cannot automatically be assumed, it would be legal to kill the child at this stage when otherwise *both mother and child would die.* It would not be legal to kill the child if it could otherwise survive the mother's death.

Considering the first of these principles, there is no argument about the right to terminate pregnancy when the mother's *life* is thereby endangered. There is however less uniformity of opinion where a deleterious effect on the mother's *health* is concerned. One view expressed is that therapeutic abortion in such cases is strictly legal only when the child is the direct cause of the maternal disease. (This would presumably apply to conditions such as toxaemia and breast cancer.) Otherwise the moral right to intervene is problematical, but could probably be justified on medical grounds. (Rabbi Isaac Schorr, quoted by Zimmels, 1952.) The third principle brings to mind the problem of the after-coming head in a case of contracted pelvis which escapes ante-natal supervision and planned Caesarian section. If craniotomy proved inevitable, it could presumably be justified by the principle of paramountcy of the mother when both she and the child are in danger.

There remains the difficult question of the right to terminate pregnancy purely because of psychological disturbance. The ecclesiastical authorities whom I consulted felt that there was no definite ruling on this point. They agreed however that due weight would be given to medical advice.

Probably the most significant factor influencing the Jewish ethical attitude is the deference given to medical opinion and the ability of the latter to over-ride all other considerations. Jakobovits (loc.cit.) thinks that Jewish law is perhaps unique in the extent to which the evidence of doctors can lawfully be trusted for legal and religious purposes. Thus, if any doctor (not necessarily Jewish) considers it advisable for his patient's welfare that Jewish religious laws be broken, then it becomes imperative to do so. In Rabbinical doctrine it is a well-established principle that saving a life supersedes all other considerations (Otzar Ha-poskim, quoted by Klein, 1959). It appears fair to say that, in the Jewish ethical view, positive action directed toward the safety of the living mother usually takes priority over a life whose viability is an unknown quantity.

I acknowledge with gratitude the advice, religious and obstetrical, given me on this subject by Rabbi Louis Jacob, of the New West End Synagogue; Rabbi Lew, of the Beth Din: Dr. Samuel Sacks, Miss M. E. Landau and Mr. Alment. I also thank Mr. Thornton for his assistance in locating suitable works of reference. But for the kindness of all these people, I would have been unable to compose this review.

References

JACOBS L. (1951) *Jewish Chronicle*, Nov. 16th, p. 15.
JAKOBOVITS I. (1955) Jewish Medical Ethics, Ph.D. Thesis, University of London.
KLEIN I. (1959) Conservative Judaism, Summer number, p. 35.
THE TALMUD Oholoth, vii, 6.
ZIMMELS H. J. (1952) Magicians, Theologians and Doctors, Goldston, London, p. 212.

III. THE ROMAN CATHOLIC VIEW

by Dom Benedict Webb, M.R.C.S., L.R.C.P.

The Christian concept of marriage is in complete contrast, in many respects, to the pagan one which is becoming so prevalent again today. The Catholic Church claims to bring the authority of Christ Himself to bear in the guidance she gives to her subjects, both on dogmatic and moral issues. She teaches, for instance, that marriage is something more than a natural contract free to be dissolved at will by human consent; it is also a sacrament, instituted by Christ Himself as a permanent union. Her teaching condemns those other practises advocated by the pagan such as contraception, sterilization and abortion for the slightest medical, or economic indication. She does so with the certainty that her teaching is right, not only because of the authority she wields but also because it is her duty to guide the human race to its supernatural end in obedience to the precepts of God.

Since this article aims at summarising the ethics of the Church on therapeutic abortion, it is necessary first clearly to define some terms. An abortion is the expulsion of a living foetus from the uterus before the 28th week of pregnancy, before that foetus is said to be viable. It may occur *spontaneously* following an accident or from some organic disease; or it may be *induced* by intentional interference. If the latter be the case, that interference is said to be *criminal* when it is procured either by the mother herself or by another for no good reason; and it is called *therapeutic* when it is carried out to save the mother from death or from serious ill-health, that is, when it is considered that to continue the pregnancy would seriously en-

danger the mother's life or health. Examples of such circumstances would be in cases of advanced pulmonary phthisis, chronic circulatory insufficiency, carcinoma of the cervix, severe toxaemia of pregnancy, and even advocated today are rubella and mental distress (cf. Rex v. Bourne, 1938). In general, it is the opinion of the gynaecologist that is the criterion in deciding if and when to terminate pregnancy in these and similar cases, and he bases that opinion on the grounds of possible damage to the mother's health, irrespective of whether or not the foetus is alive.

The teaching of the Catholic Church on the morality of procuring an abortion is clear and forthright. It is her duty to give moral decisions so that we might know what is God's Will in our regard. She strengthens her teaching, in serious cases, with legislation of a penal character. She first distinguishes between *direct* and *indirect* abortion. *Direct*, voluntary abortion is performed when means are employed to procure the ejection of the foetus as the primary end of the medical treatment used. This is always wrong since it is the direct killing of an *innocent* human being. The foetus is not an unjust aggressor and therefore its destruction cannot be permitted. The obstetrician must do all he can to save both the mother and the pregnancy but he must take no action the *direct effect* of which is to kill either of them. The Church has always condemned direct abortion and she imposes excommunication on those who effectively procure it.

When abortion occurs naturally but is incomplete, and the signs indicate that the foetus is dead, it is obviously permissable to evacuate the dead tissue from the uterus. In cases of threatened abortion, however, when the evidence suggests that the foetus is still alive, even though the abortion threatens to become "inevitable", it is not permissible to evacuate the uturus since this would be direct abortion.

Indirect abortion is a very different problem. It is the result of some action or treatment the purpose of which is other than abortion. For instance, if pregnancy occurred in an early case of carcinoma of the cervix, the death of the foetus would obviously result from treatment, surgical or radiological, of the diseased uterus. Yet the Church allows this since the treatment is not directed primarily to killing the foetus but to the removal of a diseased uterus and as a secondary result, the foetus would be destroyed. The death of the foetus is not essential to the means taken; it is visualised and permitted but not desired by the surgeon. This course of action invokes the Principle of the Double Effect. Any action can have two effects, the direct effect and the indirect effect. An act is evil if the direct effect is evil and consequently that act is never morally permissible. The Principle of the Double Effect states that, provided the purpose of the agent is a good one; that what he actually does is good or at least indifferent; that what he does results in a good effect not achieved by means of the evil effect; and that there is a suitably grave reason for entering on the whole course of action: then one may permit the evil effect which also results.

The difference between direct and indirect abortion should now be clear. The Church permits indirect abortion if the reason is sufficiently grave to justify it. In the majority of cases, the teaching of the Church is in agreement with the conclusions of common sense, ethics and good medical practice. There are some well known examples, however, of cases where she differs from the usual practice, such as in the treatment of rape and ectopic gestation. In rape, there is unjust aggression and the violated woman has every right to take such means as are possible to remove the semen before conception has occurred. Once the ovum has been fertilised, however, she cannot terminate the life of this being on the grounds that it is an aggressor since the aggressive factor is the male element and the male element alone. The pregnancy must be allowed to continue even though the child may be unwanted since every human being has the right to its existence and we have no right to destroy its innocent life.

In ectopic pregnancy, the variety of situations makes this a more difficult topic to summarise. The commonest site is tubal, either interstitial, isthmal or ampullary. Less commonly, the foetus starts growing in the abdominal cavity or most uncommonly of all, in the ovary. In very rare instances, it has been known for the primary tubal pregnancy to go to term and be removed by Caesarean section. In the majority of cases, the ovum is expelled either through the fimbriated end of the tube or by rupture, and both these events are usually accompanied by severe haemorrhage endangering

the health of the mother. Death of the foetus is the usual sequel to rupture and no moral problem is presented to the surgeon. Very rarely, a secondary ectopic gestation results in some position outside the tube which threatens to result in further serious haemorrhage.

Hence, three situations commonly present themselves to the surgeon. Firstly, the woman admitted with severe haemorrhage following rupture of the tube is in grave danger of death. Applying the principle of the double effect, the bleeding blood vessel may be ligatured since it is the offending cause of the danger and as a secondary effect the foetus will die in consequence. Once this has been done, the dead foetus may be removed.

Secondly, where a tubal pregnancy is diagnosed and only mild symtoms are in evidence, it is possible either to allow the pregnancy to continue in the hope that the child can be delivered near term by Caesarean section, or to remove the organ containing the developing foetus. The latter is more normal practice and it is justifiable on moral grounds since the ovary or tube is in a pathological state and to remove it is to remove a diseased organ, even if the indirect effect is death of the foetus.

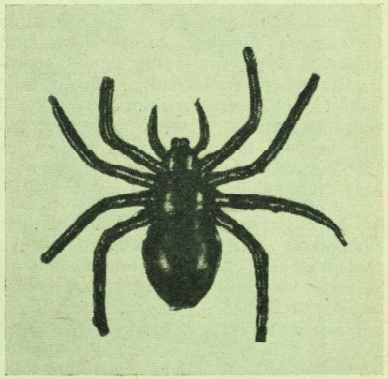
Thirdly, if the ectopic gestation is discovered accidently during another abdominal operation, it is morally possible to remove the diseased organ on the same principle provided it is considered that the foetus would be unlikely to go to term. The danger of haemorrhage is always present in these cases and there is adequate reason for removing the organ containing the ectopic. It would be wrong to remove the ovum while attempting to preserve the organ containing it since this would be direct killing of the ovum and this has been condemned by the Holy See.

In conclusion, Catholics must surely feel grateful for the guidance of the Church in this matter which is so full of problems for the unaided conscience, as every doctor knows; the Church speaks with the authority of Christ and Catholics know that they are right with the certainty of Faith.

AN UNUSUAL FOREIGN BODY

One of the fascinations of working in the Ear, Nose and Throat Department is the finding of unusual foreign bodies in the various orifices of the head. In the last few weeks I have removed several fishbones from the pharynx, and a pin, match head and barley husk from ears. But the most unusual find had the following history :—

The patient, Mr. M. E., aged 18, came to the Department in a very distressed condition at 12.30 p.m. on 30.1.59. Bloodstained saliva was exuding from the corners of his mouth, and he smelt strongly of beer. When he announced, with obvious pain, that he had swallowed a spider, eyebrows were raised. However, with the aid of two assistants, I was able to depress the tongue enough to see a black leg sticking up behind it and, to our great surprise, a gentle tug with a pair of aural forceps produced a large spider (see photo). When the patient had recovered, he was able to explain the presence of this in his throat. A "friend" had put it in his beer mug as a practical joke but, being thirsty, he drained his beer at one draught and imbibed the object without noticing it. The spider was made of plastic !



I hope this case will avert a similar tragedy for other enthusiastic drinking men.

I would like to thank Mr. F. C. W. Capps for permission to report the case, and Mr. Harrison for taking the photograph.

THE LIFE AND WORKS OF JOHN SNOW

The Wix Prize Essay, 1959, *by* M. T. Barton

PART II : ANAESTHESIA

Three qualities, dexerity, speed and courage marked the Surgeon of the early 19th Century. An operation was an ordeal, both for the sensitive onlooker and the agonised patient. Because of the fear of peritonitis, abdominal surgery remained unthought of: thoracic surgery was unheard of, and the Surgeon's skill was mainly directed towards amputations and the removal of tumours. It was a question of which reached you first —death or the Surgeon's knife. To reduce the time of suffering, the best Surgeons of the day developed an amazing speed in operating. Mesmerism, morphia, alcohol had been used to reduce the patients pain without convincing success. In 1800 Davy, after careful experiment, noted that nitrous oxide was capable of destroying pain and might be used in surgery that did not occasion too great a loss of blood, but he did not follow it up, possibly the greatest missed opportunity in the history of anaesthesia.

In 1845, because of his poor technique, Wells was laughed from the operating theatre of the Massachusets General Hospital when he attempted to use nitrous oxide to kill the pain of an operation. But on October 16th 1846, before a sceptical and incredulous audience, Morton successfully etherized a patient in the same operating theatre where Wells had previously failed. John Collins Warren, senior Surgeon to the hospital removed a vascular tumour from the neck of the unconscious patient, and then, amazed, turned to his audience and said "Gentlemen, this is no humbug".

Jacob Bigelow, an onlooker at the operation, wrote to Dr. Boott of London and on December 19th, 1846, ether was first used in this country in a dental extraction. Two days later Robert Liston, the most famous surgeon in London performed two operations at University College Hospital before an audience of notable men, including Joseph Lister and J. C. Clover who in later years became himself famous in anaesthesia. In the issue of the Lancet dated January 7th 1847. Boott publicly announced the new pain killer and reproduced Bigelow's letter to him.

Snow seized upon the new discovery apparently at first as a subject perfect for scientific investigation. His previous experiments on the inhalation of carbon dioxide, his interest in the physiology of respiration and the keenness of his mind fitted him admirably for the task.

The methods at first used in England followed the pattern of Morton's inhaler—ether soaked sponges inside a glass container connected to some sort of mouthpiece fitted with valves to ensure a one way flow. Snow quickly perceived the fundamental errors in this technique : the ether on vaporising would cool the incoming air so much that the patient would be breathing vapour so cold that it would only increase the already irritant properties of ether, making it harder still to get a smooth induction : the sponges would block the flow of air : and, whatever way was used for giving ether, the operator had no idea what the effective concentration of ether was. By January 16, 1847, Snow had worked out the vapour pressure of ether at various air temperatures, and had arrived at a roughly suitable concentration figure for it. He had already designed an inhaler that did away with sponges and other obstructions to air entry and was having it made by Mr. Fergusson of Giltspur Street, Instrument maker to St. Bartholomew's Hospital. Shortly afterwards the inhaler was ready and Snow published an account of it. with illustrations, in the Lancet. An example of this inhaler exists today at the Royal College of Physicians, together with one of the earliest facepieces and a thermometer called a 'Thermoaetherometer' which is graduated in degrees Fahrenheit and in cubic inches of ether vapour per 100 cubic inches air "according to Dr. Snow's tables". In this inhaler air was drawn round a helix over the ether surface and then through a flexible pipe to the mouthpiece. The vaporizing chamber was intended to be placed in a basin of water kept at that temperature which would ensure the desired ether vapour concentration according to Snow's calculations. He calculated the dimensions of this apparatus with great care so that there should be easy vaporization and no obstruction to the passage of air.

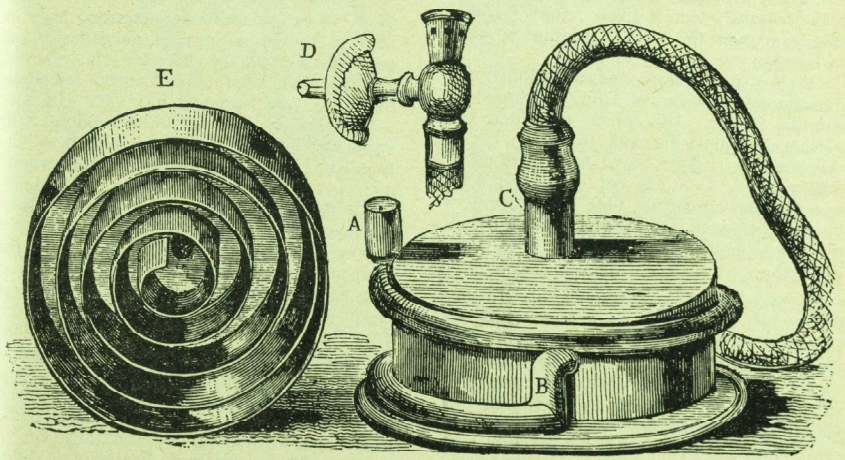
Snows work at this early stage was an important advance in the technique of anaesthesia. All other forms of apparatus were the results of empiricism. Snow was the first man to bring a scientific mind to bear on the problem, and quickly, by experimenting on himself and animals, to work out a suitable vapour concentration. Richardson relates a story of how Snow came to start his career as an anaesthetist—almost by chance. "One day, on coming out of one of the hospitals, he met a druggist whom he knew bustling along with a large ether apparatus under his arm. 'Good morning' said Dr. Snow. 'Good morning to you, doctor' said the friend, 'but don't detain me, I am giving ether here and there and everywhere, and am getting quite into an ether practice. Good morning, doctor !' 'Rather peculiar !' said the doctor to himself, 'for this man has not the remotest physiological idea. If he can get an ether practice, perchance some scraps of the same thing might fall to a scientific unfortunate.'

The success of ether was by no means assured in the early months of 1847. Excitement and struggling so frequently preceded insensibility, and often the patient could not be anaesthetized at all : it may well have been Snow's confidence in his own ability compared with the poor showing of others that really led him to seek permission to give ether in the Out-Patients department of St. George's Hospital. His success here led to his being invited to give ether in the main theatre of the hospital and on January 28 he gave it "with very satisfactory results".

Success attended him and his methods began to attract attention. An article in the Lancet at the end of January says "The apparatus of Dr. Snow, as exhibited at St. George's Hospital on Wednesday last, was certainly most ingenious and perfectly successful, and I think has many advantages. But its success may be found, perhaps to depend more upon tact and thorough knowledge of the effects of the vapour on the system, as shown by its exhibitor Dr. Snow, than upon any peculiarity in its arrangement and mechanical construction."

On February 4th, Snow gave ether for Mr. Caesar Hawkins of St. George's before Sir Benjamin Brodie and many others. After the operations Mr. Hawkins "said that he wished publicly to express the thanks of himself and his colleagues to Dr. Snow who had invented the apparatus and applied it in these cases. He considered the instrument of Dr. Snow very much superior to those they had previously used and it had the great advantage of enabling us to regulate the proportion of vapour administered."

Ten days later Snow addressed the West-



A, Opening of pipe at which the air enters.—B, Termination of pipe in the tin box.—C, Point at which flexible tube is removable by unscrewing.—D, Mouth-piece.—E, Tin vessel, with bottom removed, to show its interior.

Snow's first ether inhaler

(an example is held at the Royal College of Physicians)

minster Medical Society on the subject of ether. He had by then determined that etherization was not asphyxiation : the effect of ether, he thought, was to reduce oxidation in the capillaries. The depth of anaesthesia could be recognised by the eye signs and the pattern of respiration. By the end of February he had increased the size of the tube on the apparatus to at least the diameter of the trachea. The Lancet describes Snow's inhaler as being one of two main types in use in London—the other being the original Squires apparatus used in the first case in the country — and considers it small, compact and portable, one peculiarly adapted to country practice. In contrast to Morton's attempts to patent the use of ether, Snow offered his inhaler free of personal profit to the Medical profession.

On March 11th Snow demonstrated the effects of ether on birds, animals and fishes at the Royal College of Physicians, and by May he was giving ether regularly at St. George's, Westminster and University College Hospitals. On May 3rd he gave ether for the great Liston, who at the conclusion of the operating session remarked that "he had at one time doubts about the utility of ether, but he had lately performed several operations in private in which the ether had been given by Dr. Snow with perfect success. Dr. Snow managed the ether better than he had previously seen it given". Snow's ability had won over the most important surgeon in London.

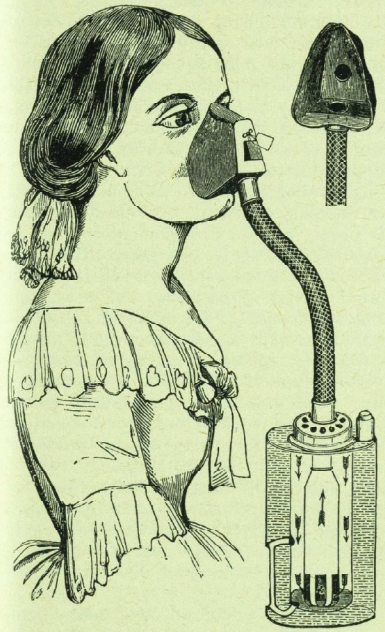
By this time Snow had abandoned the mouthpiece in favour of a mask invented by Francis Sibson : this mask permitted the patient to inhale through the nose, but it was not long before Snow had modified it, fitting valves to it, to cut down the dead space of the apparatus. One of these valves he made moveable so that he could dilute the anaesthetic mixture with air during the induction.

On May 12, 1847, Snow gave a lecture to the United Services Institution in which he presented all his views on etherization to that date. He explained the relation between the air temperature and the ether vapour content with care and went on to recommend a vapour concentration of just under 50 per cent. Although he strongly denied any connection between etherization and asphyxia, he pointed out the great dangers of suffocation and the necessity of having an easy air flow through the inhaler. Snow explained his method of giving ether slowly, using greatly diluted vapour at first, and the signs to be seen in the patient as the depth of anaesthesia increased. Even thus early in the history of anaesthesia, Snow insists on the ether being given by a medically qualified person, whose whole attention should be directed to the task, while the ether is being given.

As the months went by Snow gave ether regularly and successfully in St. George's and University College Hospitals, though his private cases were very few. In the Autumn of 1847 he published his first book, "On the inhalation of the vapour of ether in surgical operations" because of the numerous questions on the subject that had been put to him. It was not indeed the first book on anaesthesia to be written in this country, for Robinson, the dentist who first used ether in England to take out a tooth, published a treatise in March. But in comparison with Snow's work, it lacks the careful thought and scientific approach. Snows book was a valuable guide to the anaesthetist of the day. He divided the process of etherization into five degrees recognising a degree during which the patient experiences various changes of feeling, whilst perfectly conscious and capable of voluntary movement. The next four degrees correspond closely with the four stages now recognised. He set out his method of giving ether, enumerated the dangers likely to be encountered, described his concept of the physiology of anaesthesia and gave notes on all the cases for which he had administered ether. The Lancet describing Snow as "one who had had very extensive experience in the administration of the vapour of ether, and who has also been distinguished by its successful administration" reviewed the book favourably, recommending it as a book that "will prove valuable to all who undertake to administer the ether vapour, by giving them very useful rules for their guidance." 126 copies were sold, priced 3/6. However the success of the book was short lived. In March two fatalities from ether had occurred and the public's confidence was shaken. The theory of the necessity and usefulness of pain gained adherents among the uninformed and the difficulties and unreliability of ether anaesthesia made many look around for a better substitute.

James Young Simpson, Professor of Midwifery at Edinburgh brought to the notice of the medical world the advantages of Chloroform in November 1847. From the

time he had first seen ether administered, he felt sure there would be other compounds of greater efficacy, and during the summer and autumn of that year he experimented with many volatile liquids, including acetone, ethyl nitrate, benzene and iodoform. The anaesthetic qualities of chloroform immediately impressed him. In contrast to ether, chloroform was quick and reliable in its



Snow's Chloroform Inhaler

Air was admitted through the droplet-shaped holes at the base of the flexible tube and passed down over the coil of bibulous paper, through slots cut in the bottom of it, and up the middle of the coil to the tube.

effect, had a more pleasant smell, was less irritant and could be given in much smaller amounts.

Chloroform quickly came to supplant ether in Europe. Simpson presented the new anaesthetic to the Medico-Chirurgical Society of Edinburgh on November 10th 1847 and by November 20th Snow had already conducted a series of experiments to establish the concentration of the vapour at various air temperatures. He appreciated its advantages but considered that greater care in its use must be exercised, because of its rapid action, and he repeated his warning that an anaesthetic must be given by a qualified administrator solely occupied with the inhalation. From the first Snow was decidedly against the Scottish practice of giving chloroform quickly in large amounts, by means of a towel or piece of lint placed over the face. He thought it rash to give such a powerful agent without any knowledge of the dose absorbed and whenever a death from chloroform arose, he insisted on his method being the way to avoid complications. Snow gave chloroform slowly, by means of an inhaler, carefully watching the patient until the required depth of anaesthesia had been reached. That chloroform was being used with enthusiasm unrestrained by caution by some, and that Snow's meticulous methods were in sharp contrast to this, is shown in an article in the Lancet of February 26th 1848. G. T. Green, surgeon-accoucheur to Queen Charlotte's Lying-in Hospital wrote attacking the injudicious use of chloroform in Midwifery, but he specifically exonerates Snow " . . . the observations of Dr. Snow deserve the highest commendations. From having most frequently witnessed his mode of administering anaesthetic agents, I can safely bear testimony to the absence in him of that heedlessness so marked in the conduct of some other practitioners".

Snow's change to chloroform was quick and almost complete. Though still maintaining the greater safety of ether, he used it only 12 times afterwards. When questioned on this, he said "I use chloroform for the same reason that you use phosphorus matches instead of the tinder box. An occasional risk never stands in the way of ready applicability." He recognized that chloroform was capable of causing sudden death from direct action on the heart, but he maintained that this would not happen if it were given carefully, and he gave it to anyone who needed it, young and old alike, confident in his ability. In the use of chloroform Snow won such general approval that some years later he admitted that "Patients are often sent to me by medical men who hesitate, or decline altogether, to sanction the use of chloroform on their own responsibility."

At first Snow gave chloroform with his ether, but soon he designed and had made an instrument better suited to the new agent.

He retained the facepiece and tube, but reduced the size of the water bath and replaced the helix with a tube of bibulous paper which dipped into the chloroform, to form an evaporating surface. It was altogether a more compact apparatus. By means of numerous experiments on animals Snow arrived at the conclusion that a 4 per cent mixture of chloroform vapour in air was safe. With the water bath in his inhaler at 60°F. he obtained a 5 per cent mixture and this he further diluted by admitted air through the facepiece. Later as his experience grew, he attempted to obtain an even smaller concentration. In May 1849, he showed the Westminster Medical Society a large balloon holding 2,000 cubic inches of air. Into this he put enough chloroform to obtain a 3 per cent mixture. He was very pleased with the effect of this, but did not put his plan into general use as he felt the balloon would get in the way of the surgeon and the necessity to inflate the balloon with air by bellows would be troublesome. "It seemed necessary to sacrifice a little of absolute perfection to convenience."

Snow's insistence on an inhaler for giving anaesthetic contrasts strongly with the Scottish method. An Edinburgh dentist declared "all inhaling instruments were useless or worse than useless and no one in Edinburgh ever dreams of having recourse to them, a handkerchief being all that is necessary'. This difference lasted until the last days of chloroform but Snow's approach to anaesthesia set the pattern for England and the Continent. Syme said contemptuously that chloroform was given in Edinburgh accordign to principles, in London according to rule : but Snow asserted that these rules were founded on principle, and it was he who raised anaesthesia from a practice of imperfection to a science.

Between May 1848 and April 1851 Snow published a series of sixteen papers in the London Medical Gazette on narcotism by the inhalation of vapours. For 20 months of this time he worked at the Brompton Hospital : he tested chloroform, ether, ethyl nitrate carbon disulphide, benzene, tribromomethane, ethyl bromide, carbon dioxide, the smoke from puff balls, opium, camphor, chlorine and many others. His research was always into the fundamental principles of anaesthesia, though he was constantly hoping to find some new drug that would combine the safety of ether with the ease of administration of chloroform. Ultimately, according to Richardson, he hoped to find the perfect drug that would abolish pain without causing the loss of consciousness. His experiments were designed to test the physical properties of the various substances, after which he determined their effects upon animals and the doses required to produce insensibility. To some, he gave short clinical trials: benzene produced violent convulsive tremors during one inhalation, which was sufficient to discourage him from further attempts. Although he made one clinical trial of ethyl nitrate and was favourably impressed by it, he did not continue its use. He obtained from Paris a relatively pure sample of ethidine dichloride, with which he anaesthetised a small series of patients at Kings College Hospital. It appears he was not dissatisfied with it, but whilst recording his cases in his book *On chloroform and other anaesthetics* he was taken ill and died without giving his conclusion. In 1856 Snow became aware of amylene, which he began to use in November. He used it in his inhaler at a 15 per cent concentration and although he found it capable of causing sudden death by its action on the heart, the margin of safety was greater. It particularly recommended itself to him because it destroyed pain without destroying consciousness. By the end of July 1857 he had used it in 238 cases, but in his hands it had caused two deaths and he reluctantly gave up using it. Although continental countries were also using amylene, the fact that it was two of Snow's patients who had died discouraged its further use.

Towards the middle of 1848, Snow began to give anaesthetics regularly for Mr. (later Sir William) Fergusson of Kings College Hospital and it is from this time that his anaesthetic practice multiplied. One may see from his notebooks in the Royal College of Physicians how the number of anaesthetic cases began to outnumber his medical cases, until shortly he made no more report of the latter than a list of dates of attendances, which for a medical practitioner were few indeed. The administration of anaesthetics became his professional occupation. In the ten years before his death he gave it over 4,000 times, in one year alone, more than 500 times. Though by modern standards this is not excessive, in the middle of last century operations were by no means so frequent as now. The large London hospitals

would operate on one or two days a week, doing three or four cases at a time. Besides the three hospitals already mentioned, Snow was called in at Charing Cross, St. Marks, the Orthopaedic Hospitals and St. James Infirmary. He gave anaesthetics at the rooms of many surgeons and in the private houses of patients. On one occasion he went to Norwich to give chloroform whilst Mr. Aston Key performed an operation to relieve intracranial pressure in a case of cerebral haemorrhage. He anaesthetised for all the major operations of the time, and for many reconstructions of hare lip. He thought that the glottis was sufficiently sensitive at the planes of anaesthesia that he obtained, to prevent blood from being inspired, but he was careful to keep the patients sitting up so that if they bled, they could be tipped forward to drain the blood away. Such was his reputation, that in 1850 he was consulted on the advisibility of giving chloroform to Queen Victoria at the birth of one of her children, but opinion was against it. Just as, at the beginning of anaesthesia, certain people were opposed to ether, claiming that squeamishness over causing pain could not accompany a bold dextrous operation, and that to abolish pain was an affront to divine law, so the use of chloroform in midwifery aroused vehement opposition. In the forefront of the battle was Simpson, who used every argument to support the practice that he had been the first to start. By 1853 the prejudice against chloroform in midwifery was still strong in the minds of the profession and the public, when the Association Medical Journal announced that on April 7th, Queen Victoria had been delivered of a prince, and that chloroform had been administered during the latter part of labour by Dr. Snow. The Lancet, representing the old guard and possibly annoyed that another journal should have announced the important news, denied strongly that chloroform had been used, and expressed horror at the idea. But it was a fact, and the successful use of chloroform in Prince Leopold's birth was an example from the very highest circles that demolished the opposition. Sir James Clarke, the Queen's physician wrote to Simpson : "The Queen had chloroform exhibited to her during her late confinement. It acted admirably. Her Majesty was greatly pleased with the effect and she certainly never has had a better recovery." In his note books Snow recorded "at twenty minutes past twelve by a clock in the Queen's apartment, I commenced to give a little chloroform with each pain, by pouring about 15 minims by measure on a folded handkerchief. Her Majesty expressed great relief from the application. The effect of the chloroform was not at any time carried to the point of quite removing consciousness." He gave it for just under a hour and was meticulous enough to notice that the Palace clock was three minutes fast.

On 14th April 1857 Snow administered chloroform to the Queen during the birth of Princess Beatrice, using the same technique. During the labour, Prince Albert gave chloroform to the Queen before Snow arrived. Although he used his inhaler for nearly all surgical operations, in midwifery he advocated using a sponge or handkerchief and maintaining analgesia rather than anaesthesia.

It is interesting in the light of modern operative techniques, to know that Snow in his lifetime realized the effect of low temperatures in body processes, and that he conducted experiments on animals with crude curare, without, however, appreciating its future use. He also performed tracheal intubation on animals, through a tracheotomy.

By 1858 he began to set down in a book all his experience and teaching on anaesthesia. He was writing the last chapter when on June 9th, 1858 he suffered a stroke: it was left to his great friend Benjamin Ward Richardson to edit the book and add the final words. The Lancet's review is an epitaph to John Snow: "We have nothing but good to say of Dr. Snow: living or dead. The present work is by far the best—indeed, the only complete treatise on the subject which we possess. The man who has left us such a legacy cannot be said to have lived in vain."

Sports News

VIEWPOINT

By the time this Journal is published the Hospital and Medical College will have settled down, after the invasion of approximately eighty new students. It is to be hoped that a great proportion of them have taken part in one or more of the many sporting activities which are offered to them.

There always have been a number of students who do not take part in any sport connected with the hospital, as the standard is considered to be below the requirements of the person concerned. It is also well known that a student maybe at Oxford or Cambridge, chooses the hospital at which he wishes to study, by the standard of the sport which he wishes to play. There is even the example of a student at Cambridge, a well-known oar, who was coming to Bart's. He was asked if he was hoping to continue his rowing career at Bart's, and replied that he wasn't, since he had heard that the standard was so low.

This situation, of course, is a vicious circle, which is very hard to break. At the moment it does appear that in one or two sports, a great improvement in the standard has taken place. Fixture lists are being strengthened, and recently both the rugger team and the cricket team have reached finals in U.H. competitions. It is up to members of all clubs to do their utmost to help break the circle, and bring back Bart's sporting activities to their pre-war standard. This is indeed a monumental task, but it can be done, and to a large extent lies in the hands of sportsmen who have just entered the hospital.

★ ★ ★

RUGGER

1st XV v. Reading, Saturday September 26th.—Lost 6—8.

After a slow start in which the team was clearly feeling its way (this being the first match of the season) two penalty goals by Stevens gave Bart's a six points lead in the first half.

In the second half a rapidly tiring Bart's team was hard pressed by Reading who eventually broke through from penalty kicks for a couple of trys, one of which was converted.

Team: J. Robson, J. Bamford, M. Britz, J. Stevens, N. Birbridge, R. R. Davies, A. P. Ross, B. O. Thomas, C. C. Carr, J. Dobson, G. Halls, J. Hamilton, D. Richards, R. Jones, A. H. Kilroy.

1st XV v. Trojans, Saturday, October 3rd—Lost 13-5.

Although the forwards settled down quickly the back play was poor and the Trojans gained two trys in the first half, one of which was converted. In the second half the play was much improved and pressure from Bart's resulted in a try by Bamford which was converted by Stevens.

After this the hospital began to tire and just before full time allowed the Trojans another try which was converted.

Team: J. Robson, S. Harris, J. E. Stevens, J. K. Bamford, N. Burbridge, R. R. Davies, N. Burbridge; B. O. Thomas, J. Hamilton, A. T. S. Knox, G. Halls, R. Jones, P. Moynagh, L. R. Thomas, A. R. Kilroy.

1st XV v. R. M. A. Sandhurst, Wednesday October 7th.—Lost 5—3.

In the early stages of the game Bart's were soon on top and both sides were playing good open football. A try by Britz gave us the lead until the fitter Sandhurst team forced play back into our '25' and succeeded in scoring an opportunist try just before half time—this was converted and Bart's started the second half 5-3 down.

In the second half Barts again dominated the play at first but superior fitness and good tackling enabled the R.M.A. to withstand the attack.

Team: J. Robson, S. Harris, J. E. Stevens, M. Britz, N. Birbridge, J. K. Bamford, C. A. C. Charlton, B. O. Thomas, M. Jennings, A. T. S. Knox, G. Halls, J. Hamilton, D. Richards, L. R. Thomas, A. R. Kilroy.

★ ★ ★

FOOTBALL

1st. XI v. Ealing Association Reserves (A.F.A. Junior Cup) Saturday October 3rd Drawn 0—0 (after extra time).

This is the first season that the club has entered for this cup and we met strong opposition in the first round. In the first half Bart's had most of the game, though the attack, due perhaps to an early injury to Philips, seemed to lack finishing power. The defence, especially Juniper, played well and Davis was safe in goal. In the second half, only the ability of the Ealing goalkeeper saved them from defeat at the hands of Prosser and Philips.

Team: J. Davis, G. Haig, F. Amponsah, B. Perris, C. Juniper, D. Prosser (capt.), L. Iregbulem, M. Waterworth, B. Hore, M. Philips, J. Kuur.

★ ★ ★

VICTORIOUS LADIES

One feels that the capture of the U.H. Cup by the Ladies' Tennis Club should receive more than a passing congratulation. The cup has been in existence for five years, and has always been held by St. Mary's Hospital. To hold both the U.H. Ladies' Hockey and Tennis trophies, the second after defeating the holder for the previous five years, not only adds to the women students' prestige, but also to that of the Hospital as a whole.

Book Reviews

SOCIAL WORK IN TUBERCULOSIS

By Margaret Coltart, Helen Raine and Elizabeth Harrison. Published by The Chest and Heart Association. Price 12s. 6d.

Miss Coltart has been Head Almoner of the Brompton Hospital for many years and in this book she offers others the benefit of her wisdom and experience. The book is simply and interestingly written and illustrated throughout with examples which make it lively and easy to read.

It is intended mainly for social workers and starts with a simple exposition of the medical factors of the disease, the types of treatment given, and the possibilities of cure and relapse.

Miss Coltart then discusses with deep understanding some of the social problems which the patient may have to face, according to his personality, family, and economic background, and some of the ways in which anxiety manifests itself in these patients. She gives detailed information of all the services available and stresses the value that prompt practical help can give, not only for its own sake but in helping to establish a good supportive relationship with the patient. The degree of support each patient needs varies greatly with his ability to cope with the knowledge that he has the disease and to face the long and disciplined treatment. She covers all aspects of illness from diagnosis through treatment and convalescence to rehabilitation and return to as near normal life as possible.

These chapters would be of great interest to students generally, many of the experiences covered being common to patients suffering from any serious illness.

The final chapters consist of an account of the way in which tuberculosis services were started in this country and their evolution to the present day. The statutory and voluntary services are enumerated in detail.

The book "aims to describe some of the personal and economic stresses which often accompany an experience of pulmonary tuberculosis, and how the methods and resources of social service in Britain can help individual patients to deal with them". It very successfully satisfies these aims.

A HISTORY OF THE MAIDA VALE HOSPITAL FOR NERVOUS DISEASES

By Anthony Feiling. With a foreword by Sir Ernest Gowers. Butterworth, 1958. 68 pp., 12 plates. 15s.

Founded in 1866 by Julius Althaus (1833-1900) as The London Infirmary for Epilepsy and Paralysis with Althaus as physician and Alexander Ure as surgeon, the famous hospital has had many eminent persons on its staff. Only outpatients were treated at first, but in 1868 a small number of in-patients were admitted, and a matron was appointed. Here in 1884 Sir Rickman Godlee performed the first operation for the removal of a tumour of the brain, his description of the operation as recorded in *The Lancet* being reprinted in this volume.

A new hospital building was opened at Maida Vale in 1903, but was not completed until ten years later, and in 1936 it was renamed the Maida Vale Hospital for Nervous Diseases. After the war it was amalgamated with the National Hospital and the Institute of Neurology. This small book is a very brief record of the history of an outstanding institution, and contains photographs and lists of members of the staff, among whom we recognise several Bart's men. Unfortunately there is no index.

J.L.T.

MODERN SURGERY FOR NURSES

(4th edition)

by

F. Wilson Harlow, M.B., F.R.C.S. (Eng.).

Published by Heinemann Price 30s.

It is easy to find the reasons for the popularity of this surgical textbook, which has had four new editions in eleven years. Though a large book (880 pages) it opens invitingly to display a clear text and a very good series of illustrations, ranging from photographs of clinical conditions and procedures to X-rays, diagrams, and drawings of instruments and equipment. It is encyclopaedic in its scope, and there must be few surgical topics on which a nurse might ask for information which are not mentioned here. Plenty of advice and help is given on nursing care, though not all of it will be accepted without reservation (e.g. the suggestion on page 504 that paralysed patients should be kept warm with hot water bottles).

All subjects in which change is rapid, such as antibiotic therapy, have been brought up to date. The section on insulin (page 831) has not been modernised, and should receive atention in the next edition, which will doubtless be needed fairly soon.

W. E. Hector.

PRINCIPALS OF MEDICINE FOR NURSES

By David Weitzman, M.D., M.R.C.P.
(Published by Faber & Faber, price 21s)

This book expressly produced for nurses and covering the syllabus set by the General Nursing Council, has a clean and straightforward style, with the exclusion of irrelevant detail.

The first two chapters on the causes and general features of disease are a carefully summarised introduction to the rest of the book, while a later chapter contains useful information on the social aspects of diseases.

It is well illustrated with excellent photographs and accompanying diagrams.

The book contains a clear index and a glossary which supplies all the necessary information.

Nurses approaching their State Registration Examination will appreciate the excellent information supplied in this book.

E. M. Harrison, S.R.N.

RECENT PAPERS BY BART'S MEN

*ABRAHAMS, *Sir* Adolphe. Stitch in the side. *Practitioner*, 182, June, 1959, pp. 771-772.

BADENOCH, A.W. Carcinoma of the bladder. *Practitioner*, 182, June, 1959, pp. 711-718.

*BANKS, T. R., TUPPER, R., WHITE, E. M. A., and WORMALL, A. Micro-determination of zinc in blood and other tissues by neutron activation analysis. *Biochem. J.*, 71, 1959, p. 21P.

*BARTHOLOMEW, M. E., TUPPER, R., and WORMALL, A. The intracellular distribution of ^{65}Zn in normal and tumour tissues after its injection into mice. *Biochem. J.*, 71, 1959, p. 15P.

BATTEN, I. W. Psychosomatic disorders in children. *Brit. med. J.*, April 25, 1959, pp 1109-1110.

*BETT, W. R. Doctor who created Sherlock Holmes: Sir Arthur Conan Doyle (1859-1930. *Nursing Mirror*, 108, May 22, 1959.

*——. The endemial colic of Devonshire. *Monthly Bull.*, 30, June, 1959, pp. 90-95.

——. Gustav Paul (1859-1935) of "Paul's Test". ***Med. Offr.*, 101, Feb. 20, 1959, p. 111.**

*——. Haffkine Institute, Bombay: Diamond Jubilee. *Nature*, 183, March 14, 1959, pp 725-726.

——. Mr. Cyril Barnard (obituary). *Nature*, 183, April 25, 1959, p. 1159.

BOURNE, Geoffrey, and WEDGWOOD, John. **Heart-disease and influenza.** *Lancet*, June 13, 1959, pp. 1226-1229.

BUCKLE, Richard M. Fluoxymesterone: a new oral androgen *Brit. med. J.*, May 30, 1959, pp. 1378-1382.

BUTLER, H. An early blastocyst of the lesser bush baby (*galago senegalensis senegalensis*); a preliminary account. *J. Anat.*, 93, April, 1959, pp. 257-261.

*CAPENER, Norman. British orthopaedics. *Lancet*, May 9, 1959, pp. 951-953.

*CASSON, F. R. C. The work of Kurt Hahn. *Int. J. soc. Psychiat.*, 4, 1959, pp. 197-203.

*CAVE, A. J. E., and PORTEOUS, C. J. A note on the semi-membranosus muscle. *Ann. roy. Coll. Surg. Engl.*, 24, April, 1959, pp. 251-256.

CUNNINGHAM, G. J., (and Winstanley, D.P.) Hyperplasia and metaplasia in the bronchial epithelium. *Ann. roy. Coll. Surg. Engl.*, 24, May, 1959, pp. 323-330.

——, (and others). Studies of the carcinogenic action of tricycloquinazoline. *Brit. J. Cancer*, 13, March, 1959, pp. 94-98.

*DALY, M. de Burgh, (and Luck, C. P.). The effects of adrenaline and noradrenaline on pulmonary haemodynamics with special reference to the role of reflexes from carotid sinus baroreceptors. *J. Physiol.*, 145, Jan., 1959, pp. 108-123.

DAVIDSON, J. K., and others. Radiological demonstration of enlarged retroperitoneal lymph-nodes. *Lancet*, May 16, 1959, pp. 1008-1010.

*DAY, George. The tardy convalescent. *Brit. med. J.*, May 2, 1959, pp. 1178-1182.

*DISCOMBE, George. Flocculation tests. *Lancet*, May 16, 1959, pp. 1005-1008.

EVANS, Frankis T. The anaesthetist's bag. *Practitioner*, 182, June, 1959, pp. 769-771.

FENTON, J. C. B., *see*, HAVARD, C. W. H., and ——.

FLETCHER, C. M., (and others). Sputum examination and the investigation of "chronic bronchitis". *Lancet*, June 13, 1959, pp. 1241-1244.

*GARROD, L. P. The chemoprophylaxis of gas gangrene. *J. roy. Army Med Corps.*, 104, 1958, pp. 209-215.

*——. *Chemotherapy of infections of the urinary tract.* 1959.

*——. Common errors in treatment with antibiotics. *Digestia Antibiotica*, Nr. 3, 1958.

*——. **The practical significance of sensitivity tests. *Report 3rd Cong. clin. Path., Brussels*, ... 1957, pp. 129-139.**

*——. Some difficulties in the sterilisation of surgical equipment. *Becton. Dickinson lectures on sterilisation*, **1st ser., 1957, pp. 7-14.**

*HANCOCK, P. E. Thompson. Reticulo-endothelial system. *In*, Raven, R. W., *ed. Cancer*, vol. 4, 1958, pp. 412-441.

HAVARD, C. W. H., and FENTON, J. C. B. Clinical evaluation of hydroclorothiazide. *Brit. med. J.*, June 20, 1959, pp. 1560-1565.

——. *see also* DAVIDSON, J. K., and others.

*HOPPER, P. K. Investigations on neutralising antibody to canine distemper virus in human serum from different countries. *Acta paediat.*, 48, 1959, pp. 43-49.

*HOWELL, Trevor H. Complications in cerebral thrombosis. *Med. Press*, 241, June 3, 1959, pp. 490-494.

*HOWKINS, John. Synchronous combined abdomino-vaginal hystero-colpectomy for cancer of the cervix—a report of fifty patients. *J. Obst. Gynaec. B. E.*, 66, April, 1959, pp. 212-219.

*HUNTER, Richard A. Some notes on the importance of manuscript records for psychiatric history. *Archives*, 4, 1959, pp. 9-11.

JONES, F. Avery (and others). Alimentary bleeding of obscure origin: a follow-up study and commentary. *Brit. med. J.*, May 2, 1959, pp. 1138-1142.

KEELE, K. D. The genesis of Mona Lisa. *J. Hist. Med.*, 14, April, 1959, pp. 135-159.

*KEYNES, W. Milo. Teratoma of the neck in relation to the thyroid gland. *Brit. J. Surg.*, 46, March, 1959, pp. 466-472.

*L'ETANG, H. E. J. Some observations on the Black Formosa Corruption and Tapanuli Fever. *Sherlock Holmes J.*, 4, Spring, 1959.

*LUMB, George, (and Shacklett, R. S.). The cardiac conduction tissue and its blood supply in the dog. *Surgical Forum*, 9, 1959, pp. 261-265.

*——, (and Shacklett, R. S.). The results of occlusion and narrowing of coronary arteries in the dog. *Proc. Fed. Amer. Soc. exp. Biol.*, 18, 1959, p. 491.

*——, (and others). Coronary flow related to cardiac conduction. *Proc. Fed. Amer. Soc. exp Biol.*, 17, 1958, p. 447.

*——, (and others). Jaundice occurring in a patient treated with chlorothiazide. *New Engl. J. Med.*, 259, Sept. 11, 1959, pp. 534-536.

MOURANT, A. E. Blood groups: introduction. Blood groups and anthropology. *Brit. med. Bull.*, 15 May, 1959, pp. 89-91; 140-144.

*NASH, D. F. Ellison. Abdominal hernia. *Hosp. soc. Serv. J.*, 69, March 20, 1959, p. 291.

*——. Ano-rectal disorders. *Hosp. soc. Serv. J.*, 69, March 13, 1959, p. 271.

*——. Goitre. *Hosp. soc. Serv. J.*, 69, March 27, 1959, p. 315.

*——. Organisation for surgery. (i), (ii). *Hosp. soc. Serv. J.*, 69, May 1, 8, 1959, p. 441; 469.

*——. Pain: its meaning and its relief. *Hosp. soc. Serv. J.*, 69, March 6, 1959, pp. 236-7.

*——. Surgical economy (i), (ii), (iii). *Hosp. soc. Serv. J.*, 69, April 10, 17, 24, 1959, pp. 359; 385; 413.

*OSWALD, N. C. Clinical aspects of chronic bronchitis. *Brit. J. Radiol.* 32, May, 1959, pp. 289-290.

*PARTINGTON, M. W. An English family with Waardenburg's syndrome. *Arch. dis. Child.*, 34, April, 1959, pp. 154-157.

*——, (and Quinton, J. F. P.) The pre-eruptive illness of measles. *Arch. dis. Childh.*, 34 April, 1959, pp. 149-153.

PORTEOUS, C. J., *see*, CAVE, A. J. E., and——.

*POSEL, M. M. The use and abuse of bed rest. *Medical Proceedings*, 5, May 2, 1959, pp. 191-193.

RACE, R. R., (and Sanger, Ruth). The inheritance of blood groups. *Brit. med. Bull.*, 15, May, 1959, pp. 99-109.

REES, E. G., *see*, SCOTT, A., and ——.

ROBERTS, G. Fulton. Haemolytic disease of the new-born. *Brit. med. Bull.*, 15, May, 1959, pp. 119-122.

——, (and Coombs, R. R. A.). The antiglobulin reaction. *Brit med. Bull.*, 15, May, 1959, pp. 113-118.

ROWNTREE, T. Congenital rectal prolapse. *Proc. roy. Soc. Med.*, 52, May, 1959, pp. 388-389.

SARMA, Vishnu. Chondrodystrophy (achondroplasia) of the foetus in ostetrics. *Brit. J. clin. Pract.*, 13, June, 1959, pp. 409-414.

*SCOTT, A. The behaviour of radioactive mercury and zinc after application to normal and abnormal skin. *Brit. J. Derm.*, 71, May, 1959, pp. 181-189.

*——, and REES, E.G. The relationship of systemic lupus erythematosus and discoid lupus erythematosus. *Arch. Derm. Syph.*, 79, April, 1959, pp. 422-435.

SCOTT, R. Bodley, *see*, DAVIDSON, J. K., and others.

*TAYLOR, M. G. The influence of the anomalous viscosity of blood upon its oscillatory flow. *Phys. in Med. Biol.*, 3, Jan., 1959, pp. 273-290.

THORNE, Napier A. The skin clinic. *Brit. J. clin. Pract.*, 13, June, 1959, pp. 454-456.

TUPPER, R., *see*, BANKS, T. E., and others.

——, *see*, BARTHOLOMEW, M. E., and others.

WALKER, Kenneth. Christ and Freud. *Med. World*, 90, June, 1959, pp. 573-575.

*WATERWORTH, Pamela M. Spurious growth inhibition by antibiotic discs having a lactose base. *J. med. Lab. Technol.*, 15, Oct., 1958, pp. 245-248.

*WEBER, F. Parkes. *Miscellaneous notes (second series)*. 1959.

WEDWOOD, John, *see*, BOURNE, Geoffrey, and ——.

WHITE, E. M. A., *see*, BANKS, T. E., and others.

WHITTLE, R. J. M. An angiosarcoma associated with an oedematous limb: a case report. *J. Fac. Radiol.*, 10, April, 1959, pp. 111-112.

WORMALL, A., *see*, BANKS, T. E., TUPPER, R., WHITE, E. M. A., and ——.

——, *see*, BARTHOLOMEW, M. E., TUPPER, R., and ——.

** Reprints received and herewith gratefully acknowledged. Please address this material to the Librarian.*

ST. BARTHOLOMEW'S HOSPITAL JOURNAL

Vol. LXIII No. 11 **NOVEMBER, 1959**

EDITORIAL

"The lifelong maintenance of a high standard of informed, critical and conscientious practice depends more than anything else on the avoidance of professional isolation." [1]

The paramount importance of the exchange of ideas in the development of the mind is the theme of both this Editorial and the whole of this Journal. Intellectual isolation not only impedes the development of the individual mind but may also lead to the stagnation of an entire community. It is encouraging to notice that to a very large extent the present generation has understood the evils of isolation, and the opportunities for the exchange of ideas present themselves not only in increasing numbers of books and journals, but also in an almost interminable series of Conferences at both National and International levels. The problems of medical education are also being tackled by national (Association for the Study of Medical Education, October 1959) and international (the 2nd World Conference on Medical Education, August, 1959) Conferences: it is interesting that the First World Conference made considerable impact on many medical schools, but that "in general the ancient medical schools of wealthier highly industrialised countries have been disinclined to alter their established curricula and teaching methods" [2]. This tendency to adhere rigidly to tradition is dangerous because it ignores the very wide range of mature experience offered by others.

One of the main criticisms of teaching at Bart's is its tendency to "isolationism" both internally and externally. Each "firm" represents an independent unit, and its students are often restricted to a few fairly limited fields. The idea of exchanges from one firm to another for a period in order to study different techniques, new cases and another approach, is in no way encouraged. This is a great loss to students in a Hospital where there would be so much to be gained from a visit to any other "firm".

The same argument may be applied on a wider scale to the absence of exchanges between the various London Hospitals. It is the ambition of most to study abroad, and most registrars and a few (too few) selected students spend some time in the U.S.A. (or more rarely, unfortunately, in the Scandinavian countries). Yet it seems that the wealth of knowledge and ideas developed in other London Hospitals goes un-noticed because there are no schemes by which it is possible to study elsewhere. Some time ago, inter-hospital ward rounds were attempted, but the idea has long been dormant. It seems

[1] W. M. Arnott, Professor of Medicine in the University of Birmingham.

[2] Ian Aird, Professor of Surgery in the University of London.

Both from addresses to the 2nd, World Conference on Medical Education, Chicago, July 1959.

so obvious that each Hospital should offer its best to students from other Hospitals by an extensive system of exchanges, which should be very simple to organise. At present, four Bart's students each year are able to go to Bristol for six weeks; more such places should be available, and it is difficult to see why this could not be organised on a National basis; in fact this is done elsewhere with considerable success. In Germany, for example, study in other universities is a very common practice among students of most subjects, and is one of the more important features to be retained in their very extensive reform of the medical curriculum. Similarly, in Denmark, after an initial six months, students do not belong to any particular hospital, but complete their clerkships (and other appointments for which they are paid) in several different hospitals. One can only hope that in years to come such ideas may be developed to a much greater extent in this country.

The principle of the exchange of ideas must also essentially apply to the methods of teaching, particularly in a subject such as medicine where there is always a wide range of opinion. It is indeed unfortunate that one of the most valuable and most interesting methods of teaching has disappeared from Bart's — namely, the Clinical Conference. "Consultations" were probably held as early as 1729 (Journal, May 1953): interesting or difficult cases were presented to staff and students, and each member of staff, in order of seniority, gave an opinion. The Consultations disappeared between the two world wars, but were revived again as Clinical-Pathological Conferences in May, 1953: discussions were between the chiefs who committed themselves to a diagnosis before the P.M. reports were revealed: but these too, popular as they were, have vanished into oblivion. Nor can it be said that such conferences have fallen into disfavour: they are held currently in the U.S.A. (see the article by Harvey Christiensen), in Canada, and also at the Hammersmith postgraduate school, and some other London teaching Hospitals, and are to be introduced into the reformed German curriculum under the title of "Communal Lectures" in which the discussion is between a physician, pharmacologist, pathologist and physiologist. This must be one of the most valuable ways of acquiring a critical mind and a sound judgment—qualities which can never be passed on by the text-books.

Dr. Charles Newman in his article elsewhere in this journal says: "Students often recognise the defects in their education before their teachers do, and take steps to remedy the defect." It is indeed unfortunate that their is almost no student representation on the many committees which discuss medical education of the future.

HEART-LUNG MACHINE IN CLINICAL USE

A cardiac operation using an artificial heart-lung machine was carried out for the first time at St. Bartholomew's Hospital on 22nd October, 1959. The operation, which was performed by a team at Hill End Hospital, St. Albans, was on a boy aged 10 years suffering from a ventricular septal defect. It lasted 5 hours.

A Melrose type of heart-lung machine was used to bypass the heart and allow the operation to be done in a "dry field". In this type of apparatus the patient's venous blood is diverted from the superior and inferior venae cavae into an oxygenator, which is essentially a rotating cylinder set almost horizontally. Within this cylinder blood travels under the influence of gravity from one end to the other, being spread over a multitude of surfaces formed by blades projecting into the lumen of the cylinder. The oxygenated blood is pumped back to the patient through a cannula tied into the femoral artery, the cannula being directed centrally so that the blood runs into the aorta and thence to the rest of the body

The heart was bypassed for 53 minutes and elective cardiac arrest with potassium was induced. The right ventricle was opened and the defect found to be about 1.5 cms. in size. It was situated high up in the interventricular septum, partially obscured by the tricuspid valve, and was closed in two layers with several interrupted mattress sutures of silk. At the time of writing this report ten days after operation the patient's convalescence had been very smooth.

The patient had originally been admitted on account of failure to thrive in infancy. A loud systolic murmur had been audible all over the praecordium and the heart had been considerably enlarged. At the age of five years, by which time he had reached a normal size, a large left to right shunt causing elevation of the pulmonary artery pressure had developed and a diagnosis of patent ductus arteriosus had been made This had been successfully divided in 1955. At operation a trial closure of the duct lowered the pulmonary artery pressure so little (128/85 to 125/70 mm. Hg.) that there was concern about the safety of dividing the duct. That the decision to divide the duct was correct was shown by the subsequent clinical improvement and fall of pulmonary artery pressure to 40/12 mm. Hg. He had improved considerably after this but a praecordial systolic murmur had persisted and a cardiac catheterisation had shown there to be a ventricular septal defect. There had thus been two congenital cardiac abnormalities, the ventricular septal defect having been masked by the large patent ductus arteriosus.

This successful operation was the culmination of 1½ years' laboratory work in the physiology department of the Medical College at Charterhouse Square. Considerable experience was gained with a Gaertner-Kay type of stationary screen oxygenator but early in 1959 a much more satisfactory type of heart-lung machine, the Melrose pump-oxygenator, was purchased and used experimentally on dogs as a preliminary to its clinical use.

[An article on Extracorporeal Circulation is to appear in the December Journal.]

★ ★ ★

Journal Staff

Following the retirement of Miss J. Chambers, Miss A. M. Macdonald has been appointed Women's Representative. We would like to thank Miss Chambers for her long service to the Journal.

The post of Assistant Editor becomes vacant at the end of this year. Applications should reach the Editor not later than December 14th.

Fifty Years Ago

In an article by A. Layman, some pungent lay criticism of the profession is set out, much of which is worthy of our consideration.

The author attacks the average practitioner for failing to keep abreast of the most recent advances in medical science while enjoying a monopoly in medical practice conferred by the state. He cites in particular the widespread ignorance of the recent advances in dietetics and asks how many practitioners could compile a diet sheet at short notice. He also complains that doctors have little enough advice to offer on prophylaxis and says that a state of public opinion is growing "in which we would rather pay you for keeping us well than for curing us when ill".

Mr. Layman also says "You are not healthy yourselves and die early and often. Why should we have any confidence in pilots who cannot keep their own boats off the rocks". The collection of fees, and "fashionable operations" are also criticised and doubts thrown on the maintenance of professional confidence. "Things occasionally seem to get about in country towns, and I am told that Mrs. Doctor has sometimes an air of 'I could and I would'... which suggests home discussion of patients... It should be legitimate grounds for divorce if any doctor's wife questions him about a patient"!

★ ★ ★

Harvey Society

On Monday, 19th October, the Harvey Society was honoured by a visit from Professor Sir W. E. Le Gros Clark, one time Professor of Anatomy at Bart's and now Professor of Anatomy in the University of Oxford, who spoke on the Piltdown Forgery. The story of the Piltdown Man must rank as one of the most extraordinary stories of the century, and the details of it are now familiar to most people; how somebody could perpetrate with considerable care a forgery, which could have no obvious gain, other than the deceiving of the eminent scientists concerned remains an enigma. As Professor Le Gros Clark stressed, we should not judge the authorities who were duped by the hoax harshly, for such a forgery had never previously occurred and there was no reason to doubt the authenti-

city of the specimens in this instance. In fact, many of those concerned were sceptical about whether the almost human cranium and the simian mandible, which were found together, belonged to the same creature, but their doubts were dispelled when other specimens were discovered nearby. Sir Wilfred lucidly described the methods by which he and other present day paleontologists had examined the fossils and pronounced them forgeries; they included fluoride estimations, radio-active carbon determinations, and chemical analyses of bones and stain, with which they had been dyed. In this way they had gained incontrovertible proof that the bones were modern, the skull human and the mandible from an orang-utang, and further study has shown that they could never have been long in the gravel beds in which they were found, as they were acid and therefore non-fossiliferous. As Professor Le Gros Clark suggested, the man who is to be most pitied in the whole affair is Smith-Woodward, who, having spent a good deal of his working life on the Piltdown Man, on his retirement bought a house at Piltdown in order that he might spend the rest of his life searching the Piltdown gravel for further specimens.

* * *

The Harvey Society arranged an "Open Day" on Thursday, October 29th for members to see the work which is being done in the pre-clinical laboratories at Charterhouse. For some it was a chance to see old tutors. Others looked at the laboratories with a critical eye for the first time. Everyone, however, must have realised how much work had been undertaken to show us so much of the research which is being done. It was a very successful evening and nobody could have come away without having found something which interested his newly found clinical mind.

The spectacular pieces of equipment such as the electron microscope and the linear accelerator which is being used in radiation studies drew a lot of people. Perhaps, though, a simple piece of apparatus and a simple clinical problem such as the study of the pharmacological properties of the α-toxin of staphylococcus pyogenes illustrated the important relationship between the laboratories and hospital best. We still remember about depolarising substances and after-potentials and we may think them less important now. It is nice, therefore, to be reminded to what extent research is the basis of medicine and the sort of problems which can be put to the test of the laboratories.

A topical subject was the effect of radiation both on the whole body (murine) and on SH-enzyme systems and unsaturated fatty acids. This was of obvious importance to all before the meeting. Afterwards most of the problems—however theoretical the perusing of a carotid sinus may seem—appeared to be important both to those doing work and to us from the hospital.

We must thank everyone who helped to arrange such an enjoyable and instructive evening. It seems a lot of work to arrange such a good demonstration for such a short time and we are all grateful for the opportunity we have had for seeing over the laboratories and having the experiments explained to us.

Christian Union

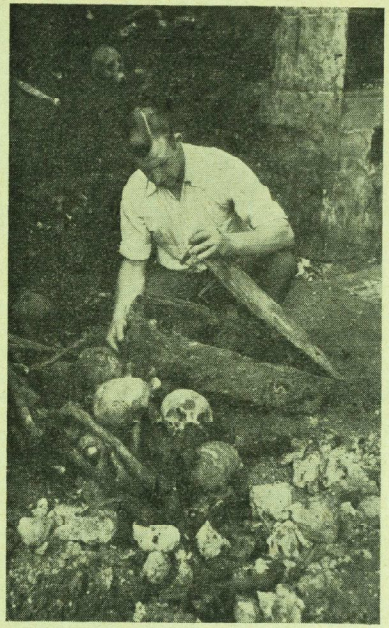
Hay Ling Chau, an island lying nine miles from Hong Kong, was the subject of an illustrated talk given by Dr. Neil Fraser at the Meeting of October 27. Uninhabited and without water supply when offered by the local government to the Mission to Lepers, the isle now accommodates over five hundred patients, has modern sanitation and electric light and this but seven years after our speaker landed there with twenty two pioneer-patients.

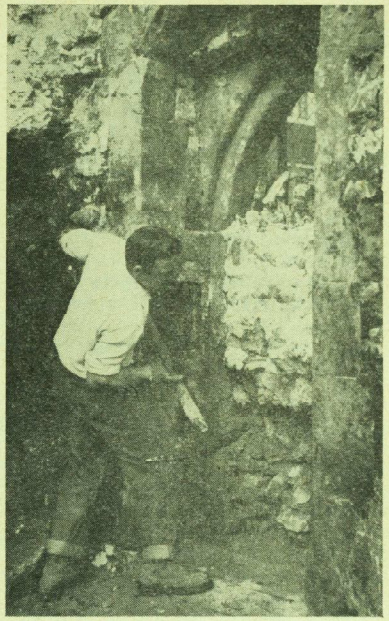
Modern sulphone drugs are curing patients and with the development of Dr. Paul Brand's tendon operations a new usefulness is being given to the Lepers' hands and feet. By rehabilitation, useless unwanted lives are being recreated. The whole man is being catered for—medical, social, occupational and spiritual. Each individual can find the comfort, strength and joy of Christ's presence. No wonder this is the Isle of Happy Healing!

★ ★ ★

Excavations in Charterhouse Square

Early this summer, while the foundations of a new building were being dug in the bombed site behind College Hall, the remains of a number of burials were uncovered, as is inevitable in ground so long covered by a warren of houses as the city has been. But of more particular





Excavations behind College Hall revealed a complete doorway of the Old Charterhouse, and an old burial ground

(Photographs by kind permission of Fox Photos Ltd., and Wates Ltd., of Norbury.)

interest, when the high brick wall dividing St. Bartholomew's property from the site came to be broken down, it was found to contain a core of mediaeval walling—no less than the wall of the eastern range of the cloister of the Carthusian monastery. In the wall were the doorways of two of the cells which made up the cloister. When the monastery was standing, there were some thirty of these cells around the court, which is the area now formed by the College Green. Previously, the doorways of another two had been found, one of which is now hidden in a cupboard in the Anatomy school. The other which stood across in the Western range of the cloister was also found earlier this year during repairs to the brick passage which falls onto the green.

Of the two doorways revealed in this wall, one consisted only of fragments of the jambs. But the other (illustrated above) cut in Reigate stone stands much as it did before the Dissolution. From documentary evidence it is known that this particular cell, together with its neighbour in the dissecting room, was given by Thomas Hatfield, Bishop of Durham, and built about 1381. Probably in the usual pattern of Carthusian houses each door led to a little two-storied house of about four rooms—a workshop, living and reading rooms, and an oratory—and behind this a garden surrounded by a high wall, all for one monk. In the photograph one can see a hatchway, built in the thickness of the wall, through which a lay brother passed the monk's meals. A groove has been cut in it, as if to admit a larger plate. Two iron catches are still in the right hand jamb, and also a groove worn by the latch as the door was opened and closed. The threshold was paved with ten inch yellow and black glazed tiles, and there were some smaller red tiles decor-

ated with patterns in yellow slip. Since their discovery the tiles have found their way to the threshhold of the identical doorway in the brick passage mentioned above, and so are again in the keeping of the Charterhouse.

After the Dissolution, the Eastern range of the cloister was apparently not incorporated into the house built by Sir Edward North from the despoiled monastery. It was perhaps let as tenements or used by squatters, and, falling into decay, was covered by the rubble of several centuries, as the pictures show. In this rubble the burials were found; they included four children's coffins of wrought iron, dating from the earlier nineteenth century. The bones were collected into boxes by the builders to be taken away for reburial. However in the night they disappeared—apparently to aid the study of anatomy in Bart's.

Much of the information for this note was supplied by the courtesy of Lord Mottistone, of Mr. S. K. Collins of the L.C.C., and of Mr. M. R. Cheval, agent for Wates Ltd. of Norbury, who watched the excavations and provided the photographs. The doorway is fortunately to be preserved in its original site.

Research at Bart's

DEPARTMENT OF ZOOLOGY AND COMPARATIVE ANATOMY

The research in progress in this Department might appear at first sight to have little to do with formal zoology. In point of fact, however, the study of zoology is the study of animals and their tissues in the widest sense. At Bart's the Zoology School employs a blend of cytology, histochemistry, embryology, radiobiology and a sort of physiological natural history to help sort out chosen problems. There are, however, no "teams". People do precisely what they like; but it is true to say that they have some vague idea of what the other fellows are doing.

Dr. Ruth Bellairs is one of the comparatively few biologists in this country who work in the field of experimental embryology. This is a curiously neglected subject in England when one thinks of its important applications to pathology. She is probably best known for her series of studies on the factors responsible for the movement and differentiation of the cells which make up the foregut in the early embryo. In collaboration with Dr. Michael Abercrombie, F.R.S. of University College, London, she has recently carried out a large series of experiments on chick embryos. Each of these involved altering the morphological structure of the embryo by taking tissues from one region of the body and grafting it into another. The results of these experiments are now being analysed and may be expected to throw new light on the tantalising problem of embryonic induction.

Dr. Bellairs' main work is now carried out by the use of the electron microscope, and is concerned with the changes taking place in developing cells. She has recently published papers on yolk absorption and on the differentiation of neuroblasts. She has been able to show that far from being a simple and "inert" material, as it is usually considered to be, yolk has a highly complex and membranous structure. She is currently studying how yolk is taken up by chick cells, a problem which may throw light on the whole question of the absorption of extraneous matter by living cells. Her studies are being supplemented by treating embryonic tissues growing *in vitro* with colloidal particles and subsequently examining these tissues by electron microscopy. As a sideline Dr. Bellairs works with her husband, Dr. A. d'A. Bellairs, on the embryology of reptiles. They are at present investigating the structure and function of the placenta in the adder, *Vipera berus*.

Dr. Dennis Lacy, in collaboration with Mr. B. Kingsley Smith and other research workers in this College and Hospital, and elsewhere, is investigating a variety of problems of biological and clinical interest. The work includes studies on the effects of radiation on the ultra structure of germinal and somatic tissue; the structure of the human amnion and chorion; the localisation of calcium oxalate and cellular changes arising during hyperoxaluria; the changes in lung epithelium due to mitral stenosis; the

structure of kidney tissue during diabetes; the mechanism of fat absorption in intestinal epithelium (with Prof. A. B. Taylor, University of Illinois); the relation between different cell types in islets of Langerhans (with Prof. E. J. W. Barrington, University of Nottingham) and structure of Acephaline gregarines (with Dr. H. Miles, University of Hull). In all cases the problems are being tackled by studying in great detail actual cells under normal conditions, or after controlled experimental stress, or during disease.

Much of this work has been made possible by a substantial grant from the Wellcome Trust and additional financial support from the Hospital and Medical College. This has enabled the purchase of an Electron Microscope, together with most of the auxiliary equipment indispensible to its efficient usage. The value of the Electron Microscope, of course, lies in its superior resolving power which is some three hundred times greater than that obtainable with the best light miscroscopes. This has made possible the study of very small structures in cells which are nearly of molecular dimensions.

Studies on the effects of radiation on germinal and somatic tissue have shown, more clearly than before, the great variation in sensitivity of different cells to high doses of radiation. Connective tissue cells of the boundary tissue of the seminiferous tubules, for example, show no apparent change in their fine structures even after a dose of 10,000r. Male germ cells, on the other hand, are rapidly affected by such a dose. During the above-described there has been obtained the first micrographs of haploid chromosomes in both normal and irradiated spermatids. The chromosomes of normal material contain many coiled fibrils only about 25 angstrom units thick: after irradiation, thicker coiled fibrils predominate. The latter may arise by the breaking, fusion and recoiling of the fine fibrils, a suggestion which may explain chromosome fragmentation as visualised by light microscopy.

Other results of this work may be briefly summarised. There has been shown the precise localisation of calcium oxalate in heart muscle of patients who have died as a result of hyperoxaliuria. Micrographs have been obtained showing fine canals in the human amnion with material passing through them. The precise route by which fat is absorbed by the intentinal epithelium of mammals has been discussed and, in a rather different animal (certain parasitic gregarines) it has been shown that the body surface is an elaborate honeycomb structure which probably aids absorption.

Dr. Brian Lofts, Miss Margaret Lamont and Dr. A. J. Marshall are all partly concerned with an investigation of the formation and distribution of progestogens in the vertebrate series by means of bioassay and chromatography. The presence of progestogens has already been shown in the post-nuptial "regressed" seminiferous tubules of male birds. Investigations are now being carried out with "lower" groups. In female birds (which do not produce a post-ovulatory corpus luteum), progestogens probably come from atretic follicles. Other departmental studies are in collaboration with zoologists in Uganda, Australia and the United States, a number of whom have spent sabbatical or other leaves at Bart's. These investigations concern the external factors involved in the control of breeding seasons in equatorial regions, the influence of internal rhythm in the migration of vertebrates, the evolution of the secretory Leydig cells of the interstitium, the factors governing the stupendous reproductive success of the plague-pest weaver-finch (*Quelea*) and (in collaboration with the Department of Physics) the effects of ionising radiations on wild and captive animals. These researches are being supported by the Nuffield Foundation, The Royal Society and the Research Committee of St. Bartholomew's Medical College.

In addition to numerous papers and publications incorporating the results of the above-mentioned studies, some rather more lengthy works are in the process of completion. Dr. Lacy has almost finished the editorship of the forthcoming edition of Bolles Lee's *Microtomists' Vade Mecum*. The seventh edition of Parker and Haswell's *A Textbook of Zoology* (Vol. II) and a new work of two volumes called *The Biology and Physiology of Birds* (Academic Press of New York) will appear early next year under the editorship of another member of the Department.

CALENDAR

DECEMBER

Sat. 26—On duty: Dr. G. W. Hayward
Mr. A. W. Badenoch
Mr. R. W. Ballantine

JANUARY

Sat. 2—On duty: Dr. E. R. Cullinan
Mr. J. P. Hosford
Mr. C. Langton Hewer
Rugger v. Rutlishians (A)

Sat. 9—On duty: Medical and Surgical Units
Mr. G. H. Ellis
Rugger v. Taunton (A)
Soccer v. O. Chigwellians 2nd XI (A)

Wed. 13—Soccer v. R.N.C. Greenwich (H)

Sat. 16—On duty: Dr. R. Bodley Scott
Mr. A. H. Hunt
Mr. F. T. Evans
Rugger v. Cheltenham (H)
Soccer v. O. Bradfieldians (H)

★ ★ ★

ANNOUNCEMENTS

Engagements

CONSTABLE—ELLISON. The engagement is announced between Michael David Constable and Marian Ellison.

GRAY—INSKIP. The engagement is announced between Dr. John Maurice Gray and Janet Fiona Inskip.

HUCKSTEP—MACBETH.—The engagement is announced between Ronald Lawrie Huckstep, F.R.C.S., and Margaret Ann Macbeth.

TAYLOR—BURDEN. The engagement is announced between Dr. James T. C. Taylor and Helen H. Burden.

Marriages

ALDER—MARTYN.—On 31st October, David Edmund Alder to Ruth Martyn.

BROADBENT—PAGET-WILKES. — On 25th September, Dr. Marcus Broadbent to Bridget (Biddy) Paget-Wilkes.

CARR—NICHOLAS.—On 3rd October, Dr. Conor John Carr to Audrey Nicholas.

GIRLING—PETERKIN.—On 5th September, at the Church of St. Bartholomew-the-Less, James Arthur Girling to Bridget Peterkin.

HEDLEY WHYTE—WALLER.—On 19th September, Dr. John Hedley Whyte to Elizabeth Tessa Waller.

KING—SINKER.—On 8th August, Hugh Alastair King to Beatrice Christine Sinker.

MILLWARD—WIGHT.—On 3rd October, at the Church of St. Bartholomew-the-Great, John Millward to Wanda Wight.

NEWTON—THOMAS.—On 5th September, Dr. Michael A. Newton to Jane Thomas.

SMITH—COCKELL.—On 5th September, Dr. Richard G. L. Smith to Elizabeth Rosemary Cockell.

Births

BACKHOUSE.—On 15th August, to Janet, wife of Dr. Ian Backhouse, a son (Paul Jonathan).

BLACKLOCK.—On 7th October, to Marjorie and Norman Blacklock, a son.

BOLTON.—In October, to Janette and Dr. Tom Bolton, a son (Christopher Mark Costin).

CHALSTREY.—On 4th October, to Aileen and Dr. John Chalstrey, a daughter (Susan Elizabeth).

DINGLE.—On 15th September, to Marion and Dr. Hugh Dingle, a daughter (Jacqueline Margaret), sister for Alison.

DOSSETOR.—On 3rd October, at Royal Victoria Hospital, Montreal, Canada, to Margaret, wife of Dr. John Dossetor, twins, brother and sister for Frances.

LAURENT.—On 12th October, to Maureen and Dr. J. Laurent, a son (Stephen Charles), brother to Richard.

MASON.—On 12th October, to Marion, wife of Dr. Seymour Mason, a third son (Anthony Colin).

MAURICE-SMITH.—On 15th October, to Joan and Norman Maurice-Smith, a son (Mark Jonathan).

MILLIGAN.—On 20th September, to Mary and Dr. H. E. Milligan, a sister for Nicola.

TAYLOR.—On 21st September, to Nora and Dr. W. N. A. Taylor, a son.

★ ★ ★

Deaths

GOSSE.—On 3rd October, Dr. Philip Henry George Gosse, aged 80. Qualified 1907.

JONES.—On 3rd October, Dr. Evan David Jones. Qualified 1926.

LEAVER. On 14th September, Dr. Robert Henry Leaver. Qualified 1930.

MELHUISH.—On 21st September, Lt.-Col. Herbert Michael Henry Melhuish, aged 83. Qualified 1902.

MORGAN.—On 3rd October, Dr. Clifford Jones Morgan, aged 35. Qualified 1947.

TIERNEY.—On 9th October, in Singapore, Dr. Thomas Fane Tierney, aged 52. Qualified 1930.

★ ★ ★

Changes of Address

DR. L. W. BATTEN, Grange Cottage, Crockham Hill, Nr. Edenbridge, Kent.

DR. A. CLARKE, 15 The Avenue, Branksome Park, Bournemouth.

MR. S. H. C. CLARKE, 104 The Drive, Hove 4, Sussex. Tel. Hove 70844.

DR. EDWIN GAWNE, 21 Ditton Lane, Cambridge. Tel. Teversham 2309.

DR. P. B. L. SALTMAN, 501 Security Buildings, Exchange Place, Capetown, S. Africa.

DR. JOHN L. STRUTHERS, Sunnyside, Baydon Road, Lambourn, Newbury, Berks.

★ ★ ★

Appointment

Dr. W. R. Bett has been appointed Medical Editor, Eaton Laboratories, Norwich, New York, U.S.A., as from 1st December, 1959.

Examination Results

CONJOINT BOARD

Final Examination, October 1959

Pathology

Francis, H.B.
Lyon, D.C.
Cassell, P. G.
Abell, J. D.
Fasan, P. O.
Pemberton, M. J.
Maurice-Smith, N. J.
Milburn, F. A.
Booth, D.
Gletsu, A.
Pettavel, J. P.
Hijazi, H. K.
Chambers, R. J.
Arnold, J.
Almeyda, J. J. R.
Gould, S. E.
Bonner-Morgan, B. M.
Vollum, D. I.

Medicine

Cox, T.A.R.
Peebles, D. J.
Hudson, M. J. K.
Davies, R. N.
Williamson, C. J. F. L.
Chambers, R. J.
Dymond, G. S.
Gould, W. A.
O'Hanlon, N. M. P.
Godwin, D.
John, R. W.
Francis, H. B.
Lyon, D. C.
Mather, J. S.
Robinson, J. S.
Marshall, R. D.
Fox, G. C.
Gabriel, R. W.
Maurice-Smith, N. J.
Arnold, J.
Alabi, G. O.

Surgery

Cox, T.A.R.
Peebles, D. J.
Godwin, D.
Roden, A. T.
Gould, W. A.
Marshall, R. D.
Fox, G. C.
Plant, J. C. D.
Robinson, J. S.
Hudson, M. J. K.
Chambers, R. J.
Richards, D. A.

Midwifery

Gould, W. A.
Marshall, R. D.
Fox, G. C.
Gabriel, R. W.
Plant, J. C. D.
Tooby, D. J.
Robinson, J. S.
Hudson, M. J. K.
Davies, R. N.
Chambers, R. J.
Richards, D. A.
Thompson, A. J.
Hobday, G. R.
Godwin, D.
John, R. W.
Roden, A. T.
Townsend, J.

The following have completed the examinations for the Diploma:

Chambers, R. J.
Marshall, R. D.
Fox, G. C.
Mather, J. S.
Plant, J. C. D.
Tooby, D. J.
Gould, W. A.
Hudson, M. J. K.
John, R. W.
Alabi, G. O.
Richards, D. A.
Thompson, A. J.
Robinson, J. S.
Godwin, D.
Gabriel, R. W.
Roden, A. T.
Townsend, J.

CASH ON DELIVERY ?

Dear Doctor,

I am going away to Lake Mweru—if at all my wife report to you for reproduction system, you will assist her Doctor.

I am willing to pay my accounts after she given birth. Thanks.

(A letter sent to Dr. P. B. P. Mellows in Kitwe, Northern Rhodesia.)

Medical Education

A SYMPOSIUM

This Journal has been devoted to the study of medical education on a comparative basis, and it is with this approach that this short summary selects various interesting features which are not part of our own curriculum, but might profitably be so. The historical approach is not the least important (Editorial, August 1959) and from the article by Dr. Charles Newman in this Journal it is easy to detect the disappearance of the cultured, literate doctor; his disappearance was commented on in 1920 by the General Medical Council who complained that three out of every thirteen "seemed unable to write good or decent English." This cry is still heard, yet little is done—even in some places Latin is withdrawn from the entrance requirements. One is pleased to notice that entrance to Bart's (and many other hospitals) is open to those with an entirely classical education.

The old German system of education which has had a very widespread influence throughout Europe, depended largely on lectures and lecture demonstrations. While this has had an important influence in assuring that clinical teaching must to a very large extent remain theoretical there is little doubt that it has given way to the idea of an "apprenticeship". Their lectures, however, continue to play an important part, and in their reformed curriculum are included subjects hardly mentioned in this country; for example, the history of medicine, theory of evolution and anthropology, genetics, medical statistics and ethics. Some of these subjects are very old, some very new, but all are of a basic importance which surely should not be neglected.

Anatomy is a subject which has been discussed at great length in recent years. The Germans consider the present extensive dissections as excessive (and describe it as "muscle cleaning"); at University College, London, the same feeling is prevalent, and already the course has been reduced by 100 hours. This is a subject much concerned with the various attempts (far more advanced in the U.S.A. and other countries) to integrate clinical and preclinical teaching: while there is a place for applied anatomy preclinically, there is considerably more purpose in giving it a place in clinical teaching, and surgical anatomy is studied in many countries (together with surgical pathology).

The place of research in medical education is discussed by Harvey Christiensen elsewhere in this Journal. In the U.S.A. it already occupies a prominent place, and is criticised because it tends to direct the attention to a few minute academic details, and away from the elements of good medical practice. On the other hand, it was pointed out at the recent World Conference on Medical Education, that a little research at some stage sharpens the mind, and makes it more alert "to the apparently inconsequential"; it provides a focus of interest which can be continuously developed, and it is the key to further successful work, for "a physician who has done no investigation by the time he has finished his postgraduate residency training is unlikely to make significant contributions to research in his subsequent career."[1] While research may be rather too prominent in the curriculum in the States, it is unfortunate that there is almost no place at all for it in this country.

It is to be hoped that this Symposium on Medical Education will stimulate some discussion (by letters to the Editor). The subject is one of immediate importance to both students and teachers, and it would seem most opportune to discuss it during this period of intended reform.

The Editor would like to thank those who contributed articles to this series, and also the following who sent views from their own countries: Professor G. Picinelli of Mantua, Italy; Dr. N. Steinhardt of Erlangen, Germany; and Mr. Ole Nielsen of Copenhagen, Denmark.

[1]Victor Johnson, Director, Mayo Foundation for Medical Education and Research, in an address given at the 2nd World Conference on Medical Education, 1959.

Medical Education in the U.S.A.

by HARVEY CHRISTIENSEN

(Stanford University)

Before coming to Bart's this summer, my understanding of British medical education was meagre indeed. As the British opinion of Americans is often based on impressions gained from our Hollywood diplomats, so too are we influenced by British productions. However, suspecting "Doctor in the House" to be not entirely representative of British medical education, I left the States with an open mind and not certain of my expectations. It was not long before I realised that some of you were confused about American medical education, and I therefore took pleasure in accepting your editor's invitation to correct some misconceptions. I must add that my ensuing discussion results from experiences at Stanford, although I doubt whether it is very different elsewhere.

American students finish high school at about 18, and on entering University with an inclination towards medicine must first complete a course designed to give him a "liberal education", with of course, the emphasis on the scientific subjects. Until recently, the pre-medical student in most universities was confronted by an array of required courses which he had to complete with high school grades in order to be eligible for admission to a medical school, and which left little time for liberal arts courses aside from the required year of Western Civilisation History, a year or two of English, perhaps a language, and a few elective courses in art, history, or the remaining humanities. Little time remained for sport or other extra-curricular activities, and so after a four year course and with a Bachelor of Science degree the pre-medical student invaded medical school with a relatively narrow outlook and education, both socially and academically. You may well suggest that pre-medical students should be well-prepared in the pre-medical sciences and I agree, but I think it is well to remember that medicine is still very much a humanistic art and it is imperative that the student be skilled in this realm too. This rigid pre-medical course may well be one of the reasons for the much too prominent position research plays in what should be our basic medical education.

Before you judge too harshly my attitude toward the narrow pre-medical education, you must understand that American schools do not offer to us an education as rich and intense in the humanities as do your own schools. Much of the knowledge we are expected to absorb in our four year college course you have already been exposed to in British schools. It is no secret that our schools lag far behind many European schools, in quantity and quality of a humanities education. Thus, while European students can academically afford to be narrow or to specialise during their university years, it is educationally unsound for American students to do likewise, if they desire a truly broad or liberal education.

Fortunately, in the past few years, a few American medical schools have recognised the possible undesirable trend toward the purely scientifically trained individual, and attempts were made to alter the entrance requirements. The student must still attain the high grade-point average, but he may now present a transcript showing excellence in the humanities of his choice as well as in the basic sciences. Furthermore, admission committees are taking a more favourable attitude toward the student who has been able to maintain a high grade-point as well as interest himself in extra-curricular activities. This new approach has been reflected in the curricular changes of several institutions, including Stanford, and although it is too early to pass judgment, I feel certain that its merit will be proven.

Medical School

Upon entering medical school, we are exposed to a two year period in the pre-clinical subjects, i.e., anatomy, physiology, bio-chemistry, histology, neuro-anatomy, pharmacology, bacteriology, and pathology. As we near our clinical years we also receive a conjoint course composed of physical diagnosis, laboratory medicine, introductory psychiatry, ob-gyn, and pediatrics. Surgery lectures on an introductory level are also begun and a brief course in dog surgery which gives us the practical aspects of operating room technique and

approach to operative procedures.

From talking with a number of Bart's students, I can detect very little difference in the pre-clinical studies in regards to the manner in which they are taught. American schools do not offer as much anatomy, but this is to some extent rectified in a short course of surgical anatomy and surgical pathology which we receive simultaneously with our third year dressing, and I believe this review at a time when we can relate more efficiently our anatomy to clinical cases is extremely valuable. The fact that our pre-clinical studies are confined to a shorter period of time also results in a more intensified course. It might be well to remind you that throughout our four years of medical school we retain our three month summer holiday period. Thus, when I speak of a year, it actually means an academic year of nine months.

If I were to criticise the pre-clinical training we receive, I should note the one lack which many of you seem to speak of in your own training and that is the absence of any clinical or shall I say any practical tying together of the basic sciences in the attempt to better relate them one to another. If such could be achieved, the learning of the basic sciences would be enhanced, and not looked upon merely as a lesson in rote. Obviously, the size of each subject prevents any great degree of conjoint teaching, and I fear that medical students will have to resign themselves to this as just another cross to bear.

Upon entering a discussion of our clinical years, perhaps the one factor contributing most to the many differences between our educations is the relatively brief time we spend (18 months) as opposed to three years for British students. Necessarily this results in a highly intensified, highly pressured learning experience from which you are relatively free. The third year in almost any American medical school means longer days, many sleepless nights, and almost no free time.

For the third or ward year, the class is divided into groups of about five individuals who remain together throughout the year. As groups we rotate in ten week periods on medicine and surgery, and in five week periods respectively on ob-gyn and pediatrics. On each service, ward rounds are at least once daily at which time one patient is presented and the illness discussed thoroughly. In addition to the ward work and rounds, each service has its special lectures usually confined to one or possibly two groups, and then several weekly sessions, which I will enumerate, which are open to staff, students, and community doctors. 1. Tumor Board; Profs. of several departments meet to discuss rare cases or cases presenting problems regarding treatment. 2. Clinical Pathological Conferences: Profs. from several departments meet to discuss in retrospect a case following death and in light of autopsy findings. 3. and 4. Medical and Surgical Grand Rounds; entire medical or surgical staff meets to discuss particularly interesting ward cases. 5. Daily clinics in various of the specialities at which the student presents the case for the day and discussion from the staff is entirely student oriented for teaching purposes. I mention these sections only because of the value and enjoyment they provide for the medical student. The discussions among the staff are always lively, as well as instructive, and the change from the dogmatic teaching of rounds and lectures is quite refreshing. I have not seen anything really comparable at Bart's.

When we have finished attending all the rounds, lectures, and various sessions, we are then free to clerk our patients. For each patient we are responsible for a more comprehensive work-up as we call it, than what I have seen expected of Bart's students. The additional work is reflected primarily in the laboratory tests and procedures which we are not only expected to do but also to be able to discuss thoroughly at the time of presentation. Routine laboratory work on each patient consists of WBC differential count, haemoglobin hematocrit, and often an ESR. The urinalysis includes a microscopic examination and gram stain if indicated. Of course, electrolyte studies and the tests requiring special equipment are done in the clinical laboratory, but any which may be performed by the students are done as needed. Thus depending upon the patients one is attending to, one or more hours a day may be spent in the laboratory. There is no doubt that the American student, by British standards, spends possibly many unnecessary hours in the laboratory, and at the time we were doing so, many of us were inclined to criticise severely the system. However, in retrospect I believe the time was well

spent from the standpoint of giving us greater familiarity with not only the laboratory procedure, but also a basis on which to judge intelligently when a certain test might be useful and how to analyse critically the findings. I cannot deny that often too much stress is placed on the laboratory findings and as a result, students tend to rely too heavily on the laboratory when making a diagnosis or planning treatment. Earlier in my studies at Bart's I was constantly being amazed by the insignificance attached to even the few laboratory studies performed, but I have learned to respect the greater clinical accumen of British students resulting from the importance given to alert clinical observation of the patient in almost every phase of your teaching that I have experienced. It remains, however, that you are not sufficiently acquainted with laboratory studies to know when they may be a useful diagnostic tool.

In regard to certain other diagnostic procedures, American students enjoy greater freedom and responsibility. I refer primarily to lumbar punctures, simple superficial biopsy, I/V cutdowns (e.g. femoral), inserting gastric tubes, etc., all of which are performed by students. Not only is the opportunity to perform these procedures valuable in a practical sense, but also results in the student taking a far greater interest in his patients. American students spend a far greater amount of time on the wards and are expected to be present when needed, almost to the extent required of the houseman, both night and day. I could not talk of the time we spent on the wards without at least commenting on Bart's Sisters and their rather rigid ward rules. In the States, there are few restrictions concerning when a student may enter the ward, and for our system of training it could hardly be any other way. The nursing staff at Bart's, however, is most efficient and superior to any I have yet witnessed.

Another glaring difference is the lack of grading pressure and relative ease with which the Bart's student is allowed to live his clinical years. While there is, I believe, something to be said for the incentive and competitive spirit inherent in a strict examination and grading system, I wonder if it does not present an unnecessary burden to an already difficult training. Your freedom, however, has its disadvantages, notably, that since you do not have examinations until near the end of your clinical studies, some of the incentive for concentrated study is lost and there is tendency to depend too much on months of revision. In our clinical years, examinations lose a proportion of their importance and the individual is graded to a large degree on his performance during the course. For the individual trained in intellectual self-discipline, the greater freedom of Bart's medical education offers great opportunities for independent learning, but unfortunately most of us have not attained that degree of self-discipline. Yet it still provides a more broadening and more tolerable existence than most American medical students experience, and I think studying and absorption of knowledge becomes more efficient and less a question of rote.

The question of the prominence of research in American education has been prsented to me on numerous occasions by British students and I will try to give briefly my impressions. Earlier I implied that the narrow pre-medical education tends toward producing individuals geared for research, and when these individuals enter upon a medical education highly impregnated by research teaching, the outcome is inevitable. At the present time, I am not opposed to the tremendous opportunities available to the American student concerning research, if they remain opportunities and not mandatory components of the education. I feel strongly that as students, we must master first the basic principles of clinical medicine before we can adequately absorb and relate the vast amount of research to our basic knowledge. Too often research knowledge is given pre-eminence over basic principle on our ward rounds and lecture teaching at Stanford, and it was in this facet of teaching that I recognized one of the greatest differences in our educations.

I have tried to give you some insight into American medical education and point out the major differences as I see them. To understand adequately the two systems, one must experience both and I sincerely hope that future years will allow greater exchange of students between our universities. May I express to the faculty and students of Bart's my very deep appreciation for the enjoyable, instructive, and unforgettable past three months. CHEERS !

The Hungarian System

by PETER BRUNNER

(Budapest and Bart's)

The Hungarian system of medical education is based on the German system which (in Germany) is at present undergoing extensive reform. It is an old system and in need of reform, but like all other systems, it has its more successful features. The purpose of this short article is to point out the main differences from the existing English system.

Its outstanding feature is that the emphasis is theoretical rather than practical, and the main method of teaching is by lectures and lecture demonstrations; for example, while there may be seven lectures in medicine in a week, only four hours are spent in the ward. This is by marked contrast with the English system, or the American, in which even more time is spent with patients, or in performing various laboratory tests. It might be argued that theory during the clinical years is still more important that practice, but in general, experience has shown that the very best way to learn medicine is at the bedside, provided that due attention is paid to theory. It is also true to say that many of the lectures during the early clinical years are aimed at co-ordinating the pre-clinical sciences with clinical methods, and subjects such as X-Ray and Surgical Anatomy, and Pathological Physiology play an early and a prominent part. This is supplemented with more of the tutorial type of teaching, in groups of about ten, in which discussion is the predominant note. Moreover, there are available facilities for almost as many additional tutorials as the student may wish to arrange.

The same emphasis on lectures applies to the pre-clinical teaching, in which practical work plays a very small part indeed. Particularly in Chemistry, the theoretical detail which has to be learnt seems rather excessive, but unfortunately it is probably a fault of many of the Eastern European Medical Schools that they depend for much of their reputation on a minute study of some of the pure sciences.

That it is possible to pass exams after such concentrated teaching is by virtue of the fact that they are taken at the end of each year, and once passed, each particular subject need never be repeated. This system is continued until the sixth year is reached when four clinical appointments are undertaken (equivalent to house jobs in medicine, surgery, paediatrics and midwifery) and after each of these a final exam is taken. Such a system clearly has the inherent disadvantage that each subject is taken in isolation, studied intensely, and then dropped, which is probably not the best system. It is interesting to notice on this subject, that exams are never written; they are entirely viva voce, which is obviously advantageous to those with confidence and alertness of mind. Is it, perhaps, a successful way of selecting the potentially successful doctor at an early stage? — for selection has always been the subject of much discussion, especially recently in England and Germany.

Political influence on the pattern of University courses in Hungary is considerable. The individual is a non-entity, rarely known by his professors or teachers; indeed, this suppression of the individual is a most lamentable state of affairs. Entrance into the Universities, while bearing some relation to ability, is made relatively very easy for the peasant classes, and extremely difficult for those of professional families and this mixture of social classes makes the course extremely difficult for some, while for others it is intellectually less stimulating. The State pays for the entire course, and the complete absence of any kind of financial sacrifice has resulted in considerable complacency, apathy, and sheer disinterestedness. Even the teaching is at times politically coloured, and the work of many of the less well known East-European scientists is given a place out of all proportion to its importance. In passing, it is interesting to add that lectures and discussions in military knowledge and political philosophy (Marxism and Leninism) are compulsory in all University courses.

I have tried to show in this brief discussion just where the main differences from the English system lie, and have indicated some of their possible faults and merits. At the basis of the whole system lies the principle of "Academic Freedom", and compulsion is always minimal.

Comments on the Spanish System

by R. DE ALARCON

(Madrid and Bart's)

Countries differ not only in the practice of Medicine but also in its teaching. This is due to a series of factors among which the most important are the economical and social structure of the country, the cultural background and trends and the character and outlook on life of the people.

In Spain the social status of the medical student is much lower than in England where to be a medical student is a glamorous affair, full of distinction and with brilliant prospects for the future. At least that is the way it is regarded by people out of the profession. In Spain this place of distinction, up to some recent reforms, has been held by the engineers, a privileged few who after much hard studying and very stiff competition manage to enter one of the Engineering Colleges. To be an engineering student meant that not only you had a high IQ but that a good job was awaiting you on qualifying. Alas, in Medicine it has been the other way round! No special examination was required to enter a Medical School apart from the equivalent to the G.C.E. at advanced level, and after qualifying there are few immediate openings in proportion to the number of applicants. If one stays in the teaching hospital world it will mean many years of hard study and work coupled with minimal pay before you can become a senior lecturer or be ready to enter the open competitions for a University chair which will bring prestige and a flourishing private practice. The other openings are to sit competitive examinations for the equivalent of the N.H.S., the Forces Medical Corps and the Rural Services. In the latter, as a country G.P. a certain amount of local prestige is shared with the squire, the priest, the chemist and the village teacher. The practice, often under difficult conditions, will be rewarding from the professional point of view and in large villages a certain amount of specialisation and group practice can be obtained.

There are about eleven medical schools in Spain, all attached to a University and never more than one per University. This will mean that in the larger towns like Madrid and Barcelona, more than 2,000 students start Medicine each year. In order to reduce this unwieldy number of students and increase the individual material and clinical facilities, a competitive entrance examination was started three years ago, and the number is further reduced in the yearly pre-clinical exams. The good old days when one could go on with a backlog of failed subjects to be dispatched at leisure are over.

The Medical Schools, except from certain Units, often lack material facilities. Spain is basically a poor country and this natural poverty was enhanced when all its gold reserves were taken to Russia and Mexico by the Communists during the Civil War, leaving the country without any currency for international trade. The impossibility of importing medical equipment and certain drugs, due to lack of currency, has spurred national industry and drugs and equipment produced in Spain are now available though not yet in the quantity required. To this can be added the fact that the Universities in Spain are practically free and tuition and examination fees are purely nominal.

In an effort to overcome these handicaps and set new standards, the first independent medical school was opened two or three years ago in Pamplona, as part of the Estudio General de Navarra. It is run on the pattern of the British medical schools, with a restricted number of students, well organised practical and clinical tuition and a carefully selected teaching staff formed by Professors and lecturers from other Universities who have left their previous chairs and posts. In a few years it will undoubtedly have an international prestige.

Degrees are conferred only by the Universities and there are no such bodies as the Conjoint Board and Apothecaries' Halls.

The curriculum at the University consists of lectures and clinical work as in England, but the old concept of University still prevails: a centre where students acquire a broad and humanistic education and outlook on life, and not a technical College churning out technicians by the dozen.

No direct control by means of tutors, reports from the consultants, etc. is kept over the students, and their knowledge and capacity is assessed by means of yearly examinations.

This free and easy attitude is found even

in the smaller provincial universities where there is much more personal contact between teaching staff and students. To be called to see the Dean or one of the professors is practically unheard of, unless one has disturbed the peace or done something really horrid.

This "University attitude" can be very formative as it stimulates personal initiative. There are many facilities for clinical experience but unless the student actively makes use of them, nobody will pick him up by the scruff of the neck and see to it that he attends and makes the most of the opportunities available.

This means that those who go ahead and get to the top are people who have not only learnt Medicine but have also learnt to fend for themselves and if afterwards they go abroad to countries where facilities and stimulus are given in the framework of an organised system, they will do well and make a name for themselves as many have done in the U.S.A. and even in this country.

On the other hand, those with less drive will fall by the wayside, or—if they have the knack to get through exams easily—will qualify with many gaps in their training and knowledge. This group would probably have fared better in the protected atmosphere of a British medical school where their lack of ambition and drive would have been counteracted by the discipline and control of the Medical School.

On account of this I would say that the average professional standard on qualifying could be higher in this country than in Spain, though the individual standard may not necessarily be so.

So far most of the teaching and state hospital appointments are competitive and the same applies to the Rural Services and the rest of the N.H.S. This means that on qualifying a student will attach himself to one or more Units—without a salary—for a year or more till he can get a post. During this time he will try to fill up the gaps left in his training and prepare himself for the job he has in mind.

There is a fair amount of emigration to the South American countries, Canada, etc. and there is a general tendency among those who are thinking of a teaching hospital career to spend a couple of years abroad.

Since the middle of the last century, Spanish Medicine has tended towards Germany; most of the important German and Austrian textbooks have been translated into Spanish which at times can be very useful, for instance in Psychiatry—and German was considered a necessary part of a complete medical training. Since the last war the interest has switched towards the English speaking countries.

When comparing Medical teaching it is interesting to look also at the medical textbooks from different countries: the German books are heavy to hold and heavy to read but exhaustively complete if one gets down to them; British books are practical and simple—often to the degree of oversimplification—with vague and scant theoretical background and blindly oblivious of the valuable things that have gone on and are still going on in other countries; the French are clear and systematic, pleasant to read and to learn, though one may sometimes question the solidity of the system; the American books with their glossy paper and excellent illustrations could well be reduced to half the number of pages without losing anything; and the Spanish books with an eclectic approach, will give you the different approaches and theories prevalent in the main scientific circles. You can get from them a worldwide view of what is going on in Medicine but sometimes there are so many possibilities you do not know which one to follow.

However, they all have their valuable points and I wish I knew one single one of them well, and the same applies to Medical Schools: some may give more facilities than others, some need improvement in some particular aspect, others in just the opposite one, but they all serve a purpose and do a useful work.

JOURNAL COVER: COMPETITION

The closing date for this competition is to be advanced to December 14th.

Readers are reminded that designs for a new cover should be drawn in black ink on white paper of the correct size. Five guineas are offered for the successful design.

Travelling Fellowships for Students

by PROFESSOR A. WORMALL

There are several organisations which provide funds to enable senior teachers and research workers to visit other countries to acquire a wider experience of medical education and research, but it is only rarely that such facilities are provided at the student level. Many students, certainly medical students who have successfully overcome their preclinical hurdles and have also spent an extra year completing their B.Sc. in Physiology, are sufficiently mature and have had enough experience to benefit greatly by a period of study or research abroad, and it may interest readers of the Journal to know that during the past three years we have been able to arrange for four of our B.Sc. students to visit important medical schools in the U.S.A. to help with research projects during the summer vacations. I feel sure that the experience they have thereby gained will be of tremendous value to them in their careers in medicine, and I know that they have already brought considerable credit to our Hospital and Medical College.

Naturally, a trip to the U.S.A. offers many attractions, and the students who are able to go there for a period of vacation work thoroughly enjoy the hectic life of research assistants to various groups engaged in biochemical, physiological and pharmacological investigations. The development of this scheme for travelling fellowships for Bart's students owes much to the enthusiasm and active assistance of Professor Arnold Schein of the Department of Biochemistry, the University of Vermont. Professor Schein, as many readers of the Journal will know, came to my Department to serve as Senior Lecturer in Biochemistry during the year 1956/57, replacing Dr. Wills who went to the U.S.A. for a year as Associate Professor of Biochemistry at the University of Vermont.

Now we have a close link with the very attractive University of Vermont and a very good friend of Bart's there who will always be happy to look after any Bart's' student who goes to work in the Department of Biochemistry at Vermont. Other friends of ours in various well-known Medical Colleges in North America are also prepared to receive in their laboratories any of our B.Sc. students who can go to work there for a minimum of three months after taking the B.Sc. examination in June. These visiting students are paid a sufficient number of dollars to allow them to live very comfortably in student accommodation on the University Campus, and also to save a sufficient number of dollars to allow them to visit selected centres in the Eastern part of the U.S.A. The remaining problem for us is to make provision for the trans-Atlantic journeys. We have been able to solve this problem in a few cases, but I shall be much more satisfied when we are able to arrange these foreign visits for a greater number of B.Sc. students. I have had excellent reports about good work carried out by all four of our student U.S.A. Fellows, and all have deservedly created a very good impression in America. Michael Besser was very popular at Burlington, Vermont, and Miss Margaret Childe had a very successful period as a research assistant in Professor Colowick's Department in The Johns Hopkins University.

In June this year, we had nine students who took a B.Sc. degree in Physiology and who had taken our B.Sc. courses in Biochemistry and Pharmacology. All nine wished to be considered for any travelling Fellowship available, but only two could be selected. Professor Daly and I, with the help of our colleagues in Physiology, Biochemistry and Pharmacology, had the difficult task of selecting two of these B.Sc. students for the trips to the U.S.A., and our choice fell on Mr. Brian Perriss and Mr. David Shand. For the next few weeks after the selection had been made, the "unsuccessful" candidates may have tried their best to assure Messrs. Perriss and Shand that they were apparently suffering from some major disease which would necessitate prolonged treatment in this country, but our selections remained healthy ("disgustingly healthy" according to some of the other seven), and they made the trip.

Brian Perriss literally received a lift across the Atlantic by the U.S. Navy and he went to Burlington, Vermont to assist Professor Schein on research, subsidised by a U.S. Navy grant, on the chemistry of some purine derivatives. I am hoping that there will be other occasions in the future when we can send students to Vermont for what I like to refer to as the "Schein Fellowship". I know

that many American biochemists, besides Dr. Schein, are prepared to give good support for our plans for interchange. For example, Professor H. B. Pierce, Chairman of the Department of Biochemistry in the University of Vermont, said in a letter to me a year ago, "I keenly regret that we do not have more interchange of both students and faculty members". He also expressed the view, and this is a sentiment which entirely agrees with my own, that discussion of problems as they exist in America and Britain undoubtedly leads to a better mutual understanding.

The cost of travelling to the U.S.A. and back for another Fellow was covered this year by a very generous grant from Mr. Ellis Stanning of the pharmaceutical firm of Lloyd-Hamol, and Mr. Stanning has assured me that he is prepared to provide a similar grant (for a Lloyd-Hamol travelling student Fellowship) next year. Our Dean has already expressed his thanks to Mr. Stanning for the generous gift he made this summer, but I should like to take this opportunity of putting on record in the Journal how greatly our Departments of Physiology, Biochemistry and Pharmacology appreciate the splendid and timely assistance given to the Fellowship scheme by Mr. Stanning. We hope and firmly believe that Lloyd-Hamol Fellows will bring much credit to Bart's and to the donor of the Fellowship. After trial for a couple of years, this Fellowship may become a general one for all B.Sc. medical students in the University of London, but at my suggestion (and I am not ashamed of it), it is limited to Bart's students for the first two years.

The first Lloyd-Hamol Fellow, David Shand, went to Emory University, Georgia, to work with an old friend of mine, Professor Geoffrey Bourne (Professor and Chairman of the Department of Anatomy!), and interesting work on the action of radiations on tissues was carried out during the summer vacation. Perriss and Shand both had very thrilling experiences in the U.S.A. and I hope that the Editor of the Journal will be able to persuade them to write articles for the Journal, describing some of their experiences in the laboratory and elsewhere. Perhaps Shand can be persuaded to say something about watching a swimmer give a demonstration of "mixed bathing" with sharks, and Perriss something about the cricket match which he and Professor Schein organised as a demonstration in Burlington. I know that this cricket match was duly reported in one of the Vermont newspapers, with an account of the game given by an American reporter who knew little about orthodox cricket terminology and was obviously more familiar with another type of ball-game.

As I have indicated above, Professor Daly and I would have been very much happier, and so would our B.Sc. students, if we could have sent nine students to North America, and I am sure we could have placed all of them in suitable laboratories in Medical Colleges in Vermont, Philadelphia and New York, or at Johns Hopkins, Yale, and Harvard, but there were difficulties in addition to the arranging of the Transatlantic journeys. A few months ago, Professor Lehninger, Professor and Director of the Department of Physiological Chemistry at Johns Hopkins School of Medicine, wrote to me and said that he and the Dean of their Medical School were prepared to provide Fellowship stipends (each of 200 dollars per month, for a period of up to four months), to allow two of our B.Sc. students to work in Professor Lehninger's Department if we could arrange to offer analogous hospitality at Bart's for two of the students from Johns Hopkins. Unfortunately, our College was not able then to provide this hospitality, so that we had to abandon for the time being any idea of an interchange of students with the great school at Baltimore. However, I have asked that the offer should remain open, and it may be that such an exchange will be possible in the not too distant future. I know that Mr. Michael Besser created a good impression when he paid a short visit to Professor Lehninger's Department.

Many readers will wonder why in my remarks I have mentioned specifically B.Sc. students, and why we have not considered travelling fellowships for other students. My own experience has taught me (and I have expressed these views in a letter I wrote to the Journal in January, 1954), that an individual usually derives the maximum benefit from a period of research abroad after he has completed his graduate course and, if possible, has supplemented this with a period of postgraduate research at home. Of all our students, the B.Sc. students come closest to satisfying these conditions, for they have completed a comprehensive scientific training, culminating in a stiff B.Sc. examination, and they have had stimulating contact with modern research investigations in our Preclinical Departments. I do not wish to suggest that the interchange of clinical students is not worthy of a similar encouragement, and in fact, I am a strong believer in interchange of students at many levels. However, I am fully convinced that our B.Sc. students, by virtue of the training they get in their final B.Sc. year, and because of the three months gap between the B.Sc. examination and the start of their clinical work, are the best students we could send to the U.S.A. to fill the student research assistant posts which our friends in America are able to finance during the summer vacations.

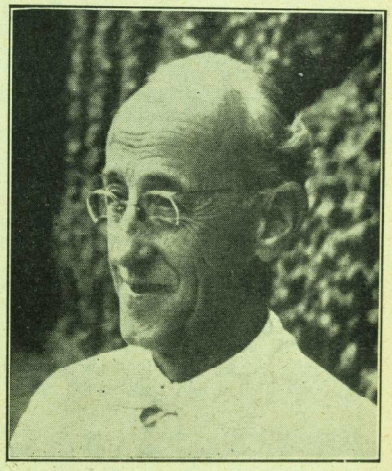
The Kommune Hospital, Copenhagen

A CLINICAL CLERKSHIP IN DENMARK

by J. C. Crawhall

The British Medical Students Association co-operate in an international scheme to encourage the exchange of medical students between different countries, generally for periods of a month or more, although sometimes two weeks is sufficient. Two of the requirements of this scheme are that the student shall have some clinical experience and have a knowledge of a language that would be understood in the country of his choice. In the case of the Scandinavian countries many of the people speak English and a knowledge of the native language is not expected. I was advised that the Danes are extremely helpful in arranging these visits and I applied to go to Copenhagen.

There are numerous hospitals in Copenhagen but the Kommune Hospital is the city hospital, now one hundred years old, and draws its patients entirely from the city and not from the suburbs. As has happened to a certain extent in London, many of the younger people in Copenhagen have gone to live in the suburbs so that 60 per cent of the patients in the Kommune Hospital were over sixty-five and there seemed to be no discrimination against geriatric cases. It is a teaching hospital affiliated to the University and I attended as directed at the 2nd Department at 8 o'clock in the morning to meet the Professor of Medicine, Hans Heckscher. One of my aims in going to Europe had been to see some medicine that was still influenced by the old Viennese traditions and in this I was not disappointed. Professor Heckscher is an active man of sixty-seven with a long sensitive face who commences his duties each day at 8 o'clock with a round of all his patients, totalling about 120. He passes from ward to ward with his little retinue of students and his wooden stethoscope. This is largely a social round in which he says a few words to each patient and assesses their progress. Occasionally he finds it necessary to use his stethoscope and as only one ear is applied to it there must be absolute silence in the ward. Nobody must talk or whisper, nobody much walk about and the windows opening onto the road outside are closed to keep out the noise of the traffic. Occasionally he would address a few words to a Canadian student and myself in English. "This young man is a little tired and a little anxious and if a patient is tired and anxious you must



Professor Heckscher

think first of all of the struma*." We saw several patients with the struma for which the drug of choice was methylthiouracil. To all the patients under his care he was prepared to be a father and spent much time explaining to them that their chance of future health lay largely in their own hands. This in many cases was literally true as he was not an advocate of modern therapeutic methods and employed the older techniques with considerable success. One recollection of my first day in the hospital was the number of patients with chronic nephritis, a condition only occasionally seen in the wards at Bart's. The professor's round was completed in about one hour and a half and his assistant physician and registrars now attended to his patients in a more extensive manner. This was a valuable time for the visiting students as all the staff spoke excellent English and would carefully explain the condition of the patient and the treatment as we went along. The command of English is partly explained by the fact that the Scandinavian text-books of medicine are not regarded as sufficient for the medical course and the more advanced students frequently read "Boyd", "Cecil and Loeb" and so on, in English. Their medical course lasts for about seven and a half years after entering the pre-clinical school, three and a half years there and four years in clinical medicine. In their final year they often hold temporary hospital appointments for which they are well paid. It is a curious anomaly of the Danish law that medical students are not able to carry out their own dissections in Anatomy, where teaching is entirely by demonstration but most students find time to go abroad generally to Sweden, but sometimes to Germany, France or England for a short six weeks course in individual dissection.

On four days of the week the staff and students assemble with the Professor again later in the morning for a conference at which various points of interest in the history or treatment of the patients is discussed. Some difficult problems arose in the treatment of the aged chronic patients, and he was not in favour of extensive therapeutic measures which would only enable them to lie in a hospital bed for a little longer. One of the Professor's main interests was in chronic respiratory disorders and he held a short clinic for male cases on Tuesday mornings and for females on Friday mornings. These were attended by his staff and students and also three physiotherapists. The basis of his treatment was that violent respiratory movements, as in asthma or chronic bronchitis, lead to emphysema and loss of functioning lung tissue and this must be avoided at all cost (H. Heckscher. *Act. Med. Scand 120*, 349, 1945). To counteract this tendency he insists that they adopt the "gorilla" position with a slightly flexed lumbar spine and shoulders brought forward to collapse the chest. As much respiratory movement as possible is then carried out abdominally. The success of the treatment depends partly upon the faith which the patient has in the professor and his method so that when they feel respiratory distress coming on they don't stand up straight and start struggling for breath. As another Danish doctor suggested to me, these patients who decide to go to Professor Heckscher must have faith in his treatment and by the unintentional method of selection his patients get considerable respiratory relief.

One morning at 8 o'clock we were met by the Professor accompanied by a middle aged lady who was troubled with lower abdominal pain. The Professor explained that he would have to carry out a vaginal and rectal examination, during which he also passed a sigmoidoscope! I was very impressed by this combination of medical and surgical outpatient treatment carried out by a physician as he was then able to reassure her that there were no abnormal findings after only about a quarter of an hour's examination.

At the end of the conference in the morning it was usual for most of the staff and students to go up to the Roentgen Ray room where recent radiographs of patients were displayed. These had previously been loaded into racks above a large screen and on pressing a button, the appropriate rack was lowered in front of the screen so that numerous pictures could be seen simultaneously. The resident radiographer then gave a detailed analysis of the findings such as there being a possibility of a bronchial carcinoma in a thoracic view, or showing the poor movements taking place in serial photographs of a stomach in which there might be an infiltrating tumour. When this demonstration had been seen the party moved off to

*Struma. The River Struma rises in Bulgaria and flows into the Aegean Sea. Goitre is endemic in this region and the "struma" has become synonymous with pathological thyroid function, viz. Struma ovarii.

the post-mortem room where a pathologist described the post-mortem findings on any patient from the 2nd department who had died the previous day. In Denmark it is necessary for relatives to register an objection to a post-mortem being held and as this is seldom done, post-mortems are carried out on over 90 per cent of the patients who die in hospital.

From the students point of view the teaching finished about mid-day after four hours of intensive clinical work and I was able to relax with a game rather like bar billiards and have a free lunch in the hospital. The rest of the day was then free to see the sights of the City, the Kunst Museum or the Carlsburg brewery, the Glyptotek or the Tivoli gardens.

This account of my stay in Copenhagen would not be complete without some mention of a visit to the ultramodern hospital at Glostrup. This hospital is on the outskirts of the city and has only been in partial use since last September. It was designed by Finnish architects, who were required to design a hospital having "concentration of services and functions with the shortest possible lines of communication". This marvellous building dominates the landscape and the internal design is both beautiful and at the same time represents the most advanced thought in hospital planning. The greatest of these marvels are undoubtedly the egg-shaped operating theatres. Air is drawn in through an air conditioning plant on the roof to minimise cross infection; the upper surface of the egg is studded with 48 lights, each of which has a separate control so that beams of light can be brought on to the operating table from any angle. At the completion of the operation the patient and the table are removed from the operating theatre and also the anaesthetic trolley so that nothing remains and the theatre can be washed out at intervals with a hose. No ward has more than six beds and each patient has a private "intercom" system to the sister's office so that he or she can have attention whenever necessary. We were accompanied round the hospital by an American architect who was a specialist in this work and he seemed convinced that Glostrup would serve as a model for all enlightened hospital design for many years to come.

THE TRIALS OF A G.P.

The following lines have been extracted from a Journal of about 70 years ago (probably the B.M.J. or the Lancet). The sentiment expressed is still a very real one.

Dr. J. Johnson of Bolton, who learns (perhaps) in suffering what he teaches in song, is credited with some amusing verses on the wrongs of the general practitioner: for doctors, like Shelley and other poets, are cradled into poesy by wrong. A too small selection must serve as a sample of Dr. Johnston's lyric complaint. Of the unhappy country doctor, he says that

He must not walk his rounds for fear his patients think him poor,
And dearly do they love to see a carriage at their door;
And if his horse is fat—"He must have little work to do,"
And if it's lean the reason is: "He starves the poor old screw."

Should he call upon his patients every day when they are ill,
His motive plainly is "to make a great big doctors bill;"
If he visits them less frequently—thus lessening their expense—
The chances are he'll be accused of wilful negligence.

About his own afflictions he must never say a word;
The notion of a doctor being ill is so absurd!
And when, perhaps from overwork, he's laid upon the shelf
His sympathising patients say: "Physician, heal thyself."

(Sent by Dr. Llewellyn Pridham.)

The Teaching of Medicine in the Nineteenth Century

by CHARLES NEWMAN

(Dean of the Postgraduate School of Medicine, Hammersmith)

The state of medical practice in England, and of the education which prepared for it, in 1800 was this; medicine consisted of diagnosing largely hypothetical states by history-taking, relying on what the patient complained of and himself observed, with practically no physical examination. Treatment was by a traditional and violent, but already simplifying, polypharmacy. The physicians were the general practitioners of the rich, rather than consultants. They were a very ancient profession, proud, arrogant and narrow at their worst, but claiming to be 'profound, sad, discreet, groundedly learned and deeply studied in physic'. They thought, and did not use their hands except for writing. They did not make medicines and were in theory not paid. They were educated by graduating (in classics) at a university, and although there were rules for obtaining medical degrees, they were very laxly observed, and it was possible to become a M.D. without ever having treated a patient, the essential training being obtained by reading. But the physicians did better than they need have done, by attending the London hospitals or going abroad, especially to Paris, for postgraduate education.

Surgeons were just emerging from what had once been a very inferior position, but in the era before anaesthetics and antiseptics operative surgery was restricted and horrible. They were essentially skilled craftsmen, and so, having little need for a literary education, had seldom been to the university. They often started by apprenticeship, and they finished their training in hospitals, the place where practical surgery could be seen.

Apothecaries, the general practitioners of all but the rich, made up their own medicines and were paid in theory only for drugs supplied, not for opinions. They were educated by a five-year apprenticeship, sometimes with a terminal period in a medical school.

Work for medical degrees at Oxford and Cambridge in 1800 was not so good an education, or so useful professionally, as it was at Edinburgh. It consisted of taking an ordinary B.A. degree, in the humanities, and then, in theory, attending further lectures in medicine (which was impossible, because the Regius Professor of Physic did not lecture for a hundred years) and in fact simply involved waiting the prescribed number of years and then performing the requisite disputations and arguments, of the mediaeval kind, or compounding for them by payments. Although the universities had been constantly reformed, they always got round the regulations, and during the 18th century had relapsed into complete inertia. The preliminary education of surgeons and apothecaries was less organised, and less classical. They were taught in local grammar-schools, and by the clergy: it was a usual thing for a country parson to augment his income by teaching a few lads. Public schools were practically non-existent, and what there were would have seemed to us more like concentration camps. Apart from the 'three Rs', apprenticeship was the preliminary education of the apothecaries and of most surgeons. Boys were apprenticed at about 13 to an apothecary, for 5 years, the latter part of which was being more and more often remitted to allow hospital study. There were great advantages in apprenticeship: as Sir James Paget stressed, it instilled a practical knowledge of medicines; of account-keeping; of business-like habits; care, neatness and cleanliness in minor surgery; gave opportunities for learning anatomy slowly; of taking up some science which taught observation, and of observing cases. But it was not always the sound training it should have been: the student who wrote to the 'Lancet' in 1847 was not exceptional in finding that 'the period of apprenticeship is passed in menial servitude instead of obtaining professional knowledge', and no less an educationalist than T. H. Huxley agreed with George Eliot that it was "that initiation in makeshift". But when it was under a good master, all was well, and Dr. James Douglas (the father of the notorious journalist) left

an interesting record of such a one. The difficulty was that a successful doctor was not necessarily a good master of apprentices, and that is was extremely difficult for a parent to find out which doctor would be.

The subjects of the subsequent professional education were medicine, surgery, some obstetrics, chemistry, anatomy, materia medica, botany and pharmacy. There was no order or arrangement of subjects, except that the clinical subjects were included from the beginning, and anatomy tended to be taught in the winter because corpses could not be preserved. The clinical subjects were taught mainly by lecture, and medicine consisted largely of what we should call physiology, of a very speculative and erratic kind. What we should call clinical medicine and surgery were also largely taught by lecture. Clinical practice still consisted of taking a detailed history and applying treatment by drugs, especially purges, emetics and diuretics, by bleeding, cupping, blistering and the establishment of 'issues', (artificial suppurations produced by implanting threads or other foreign bodies under the skin in sites of esoteric significance). All this could be taught by lecture, and clinical medicine in our sense was represented by 'walking the wards', an exercise of so little relative importance that it is not easy to find out what it actually consisted of. At St. Bartholomew's, in 1818, according to an eye-witness, who told Sir Norman Moore, there was still an old physician "who did his rounds in the ancient way. He came in and sat down, with the apothecary on one side of him, the sister on the other, and the matron holding the towel. He saw each patient in turn, and the apothecary took down the prescriptions." A teacher in 1810 "called the attention to every symptom and watched every change": "walking the wards amounted to little more than looking at the cases and hearing the remarks of the medical attendant". It is clear that there was no physical examination in our sense: all the physician did was to ask about symptoms, decide what was going wrong and prescribe the appropriate treatment. He accepted the patient's opinion about lumps, tendernesses and other physical changes: the only physical examination he made was to feel the pulse, look at the tongue, the face, the urine, the blood shed by venesection, and sometimes the faeces. Even these interested him from the point of view of the state of the humours, not that of the heart or other organs. The shed blood was equivalent to the erythrocyte sedimentation rate, because the thickness of the layer of yellow clot (the "buffy coat") depended on the extent to which the corpuscles had settled before the blood clotted, and they knew that a thick buffy coat meant something serious.

The teaching of surgery included attendance on operations in addition to lectures and 'walking the wards'. There was much less operative surgery than is generally supposed, but what there was, was more than enough to be more impressive than any of the other hospital activities. 'Watching operations' was not only a major part of a surgeon's training: it was an interest of the lay public till late in the 19th century: see, for instance, the habits of Charles Bravo (who was poisoned in 1876).

Obstetrics was taught by lectures, mostly of an unbelievably indecent kind.

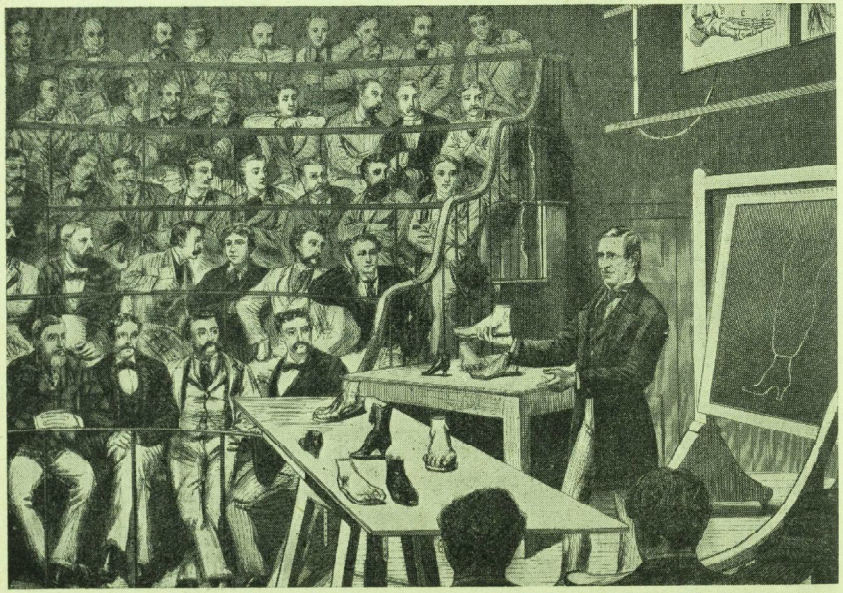
Chemistry had been taught since 1772 at least, not, as now, as an aspect of physiology, but in relation to drug treatment, the subject which of all others most interested doctors. The inclusion of mineral remedies, as well as the old vegetable and animal ones, must have been important to the profession in those days. It was an odd sort of chemistry: what might be described as 'chemical natural history' rather than scientific chemistry, and 'practical chemistry' meant demonstrations in the lecture-theatre, not laboratory work, of which there was none. But with the discovery of oxygen, the final abandonment of 'phlogiston', and the advances in chemical engineering brought about in France by the needs of the Revolutionary Wars, chemistry began to develop fast in its own right, though it still had little relation to medicine until almost a hundred years later.

Anatomy had ever since the Renaissance been a most important subject for medical students. Until the 18th century they did not themselves dissect: they attended 'anatomies', which meant demonstrations by a physician on four consecutive half days (two on the 'natural', and one each on the 'vital' and 'animal' parts). The demonstrations were held on the body of an executed criminal, dissected and pointed out by a surgeon (if it did not come to life under the stimulus, as it sometimes did). Anatomy not only included a great deal of what we include as physiology, it was itself two subjects: 'spe-

cial anatomy', which was the study of bones, viscera, vessels, etc. as such, and 'general anatomy', meaning topographical relations, which was the basis of surgery: in fact, when speed and accuracy were the essence of surgery, special anatomy practically was surgery.

The revival of science at the end of the 18th century led to a great enthusiasm for dissection. The hospital schools provided for it in winter sessions only, because the staffs would not teach in summer and said that bodies would not keep except in cold weather (which was true). Such, however, was the demand that enthusiastic teachers, or men who could not get into hospital staffs, started private schools, which flourished because they provided dissection in summer as well as winter, and arranged for more and better demonstrators. The increase in dissection led to a shortage of bodies, and so to the scandals of body snatching and ultimately murder, until Warburton's Anatomy Act of 1832 put things right.

Materia medica and practical pharmacy were the essence of the education of an apothecary, and although surgeons were not allowed to give internal medicines, there was plenty of the pharmacy of external remedies, and even the physicians were expected to know about the drugs they used, although they had not the same practical need for the knowledge as they had in the 17th century, when they gathered their own herbs, and when the law empowered physicians to raid druggists' shops to see if their drugs were genuine. Botany was taught as the scientific basis of materia medica, a highly characteristic instance of the stupidity of educationalists: it was of the merest theoretical interest from their point of view but it would have been most valuable if it had been taught as a descriptive science, because the great advance which was just beginning was the recognition and description of "diseases" as though they were natural entities like the classes of plants described and named by Linnaeus. Sir James Paget said of the practical botany on which he spent so much of his time early in life "the knowledge was useless: the discipline of acquiring it was beyond all price".



". . . the most gentlemanly class I have ever seen." (Elizabeth Blackwell)

Sir James Paget lecturing at Bart's

Except for dissection and surgical operations, the whole of medical education before 1800 could be done in the lecture theatre. That was what made it so easy to set up a private medical school. The hospital schools provide very few demonstrators in the dissecting rooms, the accommodation was terrible—Sir Henry Thompson describes it in his novel "Charley Kingston's Aunt" as: "the half-lighted vaults in which (in 1825) this course of study was followed under conditions which were loathsome and unwholesome to a needless degree". Moreover, the staffs would not teach in the summer. Now students were unwilling to waste time, so private schools of anatomy were started by energetic teachers, who taught anatomy all the year round and by collecting dried plants, diagrams and so on, and by bringing in colleagues in other subjects, soon built up medical schools complete except for the teaching of practical medicine and surgery, of which there was very little anyway. It was all very easy, because it involved no new idea: even the hospital schools were built largely or wholly at the expense of members of the staff, so that even they were looked on as almost the property of the staffs: so, almost, were the hospitals. The only teaching hospitals in London in 1800 were St. Bartholomew's, the United Hospitals (St. Thomas's and Guy's) and the London (the first complete school, 1785), with some teaching at the Middlesex and St. George's. The private medical schools did very useful work in their time, although foreigners were horrified that they existed "undisturbed by Government, which pays little attention to such things". They were in some instances the origins of hospital schools: Lane's Grosvenor School became St. Mary's, and they were the model on which the medical schools of the United States were constituted.

One other very important change happened early in the century. Students often recognise the defects in their education before their teachers do, and take steps to remedy the defect. The students at St. Bartholomew's, who were provided by the authorities with no accommodation but a small library in a room next to the operating theatre, started a reading club for themselves in a room over a baker's shop, and so took the first step towards the subsequent foundation, both there and in other hospitals, of the students' medical societies which played an essential part in disseminating new scientific ideas and in reforming clerkships and resident appointments.

It may be felt that medical education in 1800 was lamentable. So it was, on paper. But what is taught in the process of education is not half so important as the way it is taught: the essence of good education is what Sir Richard Livingstone clarified as "the bringing of the students into contact with the first rate". If a teacher aims at the very highest ideals, and constantly, when in the presence of students, does his very best, he is educating. And as medicine is, to the patient, how the doctor does it rather than what the doctor does, this is particularly true of medicine.

The first change in medical education after 1800 was brought about by the Apothecaries Act of 1815. The renaissance of scientific method, which arose from the same ferment that produced the French Revolution, led to a renewed applicaton of science to medicine (in France) and to a complete reform of the medical schools in Paris. Victorious nations always imitate the defeated, and such events were bound to affect England. Moreover, periods of scientific revival are always accompanied by popular superstition, the Renaissance by an increased belief in witches, modern science by belief in astrology, charms, osteopathy and so on, and the late 18th century revival was the era of Katterfelto, Cagliostro, Graham and a vast horde of quacks. It was said that at the beginning of the 19th century there were, in Lincolnshire, nine unqualified doctors to every one qualified. This flourishing of unqualified practice roused an outraged profession to demand reform, and was the main cause of the agitation which started in 1804 and led to the Apothecaries Act of 1815. This Act specified the principles (very wisely), rather than the details, of the education and qualification of apothecaries, and virtually handed the profession over to the Society of Apothecaries for half a century, on the whole to everyone's advantage. The improvement in education can be seen from the curriculum required by Apothecaries' Hall when, by 1835, things had become settled:

First Winter Session: Anatomy and Physiology. Chemistry. Materia Medica and Therapeutics.

First Summer Session: Botany and Vegetable Physiology.

Second Winter Session: Anatomy and Physiology, Dissection, Principles and Practice of Medicine.

Second Summer Session: Medical Practice, Forensic Medicine, Practical Chemistry, Morbid Anatomy and Clinical Medicine.

Third Winter Session: Dissection, Principles and Practice of Medicine, Morbid Anatomy and Clinical Medicine.

Not at all a bad curriculum: plenty of the more advanced-minded teachers today would, with leave play with the first summer session, be delighted to bring up an experimental group on it.

This advance was followed almost immediately by the real scientific revolution in medicine, consequent upon the publication of Laënnec's *"Traité del'Auscultation Médiate"* in 1819. This started the practice of auscultation, and although, as Dr. East pointed out in his FitzPatrick Lectures, Corvisant had been using palpation and percussion in the diagnosis of cardiac enlargment by 1818 (as had Albertini used palpation in the 1640's) it was the use of the stethoscope which popularised inspection, palpation and percussion. At St. Bartholomew's, Peter Mere Latham was in the forefront of the disciples of Laennect in England, in the early 1820's, and physical examinations are noted in the earliest surviving records in the hospital, in 1826. At Guy's, auscultation, and with it physical examination, was introduced by Hodgkin in 1822 (Dr. Terence East) although there are no records in the earliest surviving case-notes (1823). The establishment of physical examination was largely due to the organised enthusiasm of the students' societies. The Abernethian Society was refounded as a students' society in 1832 and the Guy's Society for Clinical Reports in 1836.

By the middle of the century the new diagnostic proceedings were in general use in the London hospitals. The older generation who had been antagonistic to the innovation was passing away, and a new generation which had taken it up was in control, and the comparison of the results of physical examination with post-mortem findings had borne such rich fruit in the description of 'organic diseases' that the practice of medicine was revolutionized. It became a deductive science, not an abstract speculation, directing attention away from the history to the physical signs (and away from the patient to his 'disease', unfortunately), substituting accurate diagnosis for theoretical pharmacotherapy as the chief intellectual interest and making medical education practical instead of literary.

Once the evolution of the scientific theory and practice of medicine had got under way, it proceeded at an extraordinary speed. By the middle of the century medicine in the restricted sense had become recognisably the same as it was in 1920: similar in spirit, though incomplete in detail. Surgery had got to the stage of anaesthetics, which so opened up its possibilities that it was a matter of a few years only before antisepsis removed its now intolerable disability. Pathology had taken a firm place as the basis of the whole subject: indeed Virchow's "Cellular Pathology", the key work of the century, was published in 1858, the year best known for the much less important Medical Act.

The Medical Act of 1858 is, in fact, so often regarded as the origin of modern medicine, that it is interesting to compare the last curriculum before the General Council of Medical Education and Registration affected it, with the Apothecaries' curriculum given above.

First Winter Session: Anatomy, Physiology, Surgery, Chemistry, Light and Electricity.

First Summer Session: Practical Chemistry, Botany, Zoology, Surgery, Materia Medica.

Second Winter Session: Anatomy, Physiology, Surgery, Medicine.

Second Summer Session: Comparative Anatomy, Materia Medica, Forensic Medicine, Midwifery, Surgery.

Third Winter Session: Surgery, Medicine, Medical Outpatients, Midwifery (including 'the district').

Third Summer Session: Midwifery, Medical wards, Vaccination.

So far from being defective, many teachers would feel that this curriculum was overburdened. Actually even more subjects were available in schools before 1858: ophthalmology, histology, pathology, dental surgery, aural surgery, public health, military surgery and hygiene. The medical schools, the hospitals and licensing authorities had certainly put their house in order before the Medical Act. It is also worth remembering that students a hundred years ago were, on the whole, extraordinarily 'well-educated' before they started medicine: the style of case-notes written then was vastly better than that of 20th century case-notes. But then so were the light novels, the sort of thing the more frivolous enjoyed: the most conspicious thing to us about the novels of Ouida is their wealth of classical and literary allusion. In the last forty years of the century medical education was largely influenced by the General Council of Medical Education and Registration set up by the Medical Act of 1858. The chief effect of the Act on education was unintentional. It said that recognised qualifications were to be registerable, in a single register. This meant that all who were included were 'Registered Medical Practitioners', not physicians, surgeons, general practitioners and so on. This meant that anyone who was registered was legally entitled to engage in any sort of medical practice, so that the General Medical Council and the public, and therefore the medical schools, became more and more obsessed with the need to ensure that every doctor, on the day he qualified, was safe to practice on the public. This meant that he must be in possession of that body of knowledge which was necessary for every doctor. Such a body of knowledge had existed in the youth of the men then in control, and it was more or less true in the middle of the century, but as time went on it became progressively less true, until now the very best medical work of today is certainly outmoded by next year, if not sooner. The accepted aim of trying to make all medical students into 'safe general practitioners' was therefore, in the long run, a misguided aim, and did a great deal of harm. The most important harm was the setting up of a false ideal, but in the immediate practical sphere it inevitably led to a progressive overcrowding of the curriculum. As each new speciality developed, its proponents became convinced of its supreme importance, and pressed for its inclusion in the students' curriculum (and their own consequent aggrandisement), and at the same time the General Medical Council and the public clamoured against the omission of something which might effect the young doctor's safety as an adviser. The result was the gradual inclusion of so many subjects that education went by the board, and the student was so overwhelmed by the details of the multifarious subjects that even the teachers and examiners started a despairing demand that students should be taught general principles, not facts. That this ideal was impossible was, in the end, their own fault; but although the teachers and examiners were the same people, they tended to behave in two different ways according as they were teaching or examining, and both the teaching of, and examination in, general principles is easier asked for than done.

The other way in which medical education went wrong was in its attitude to the general education which preceded it. There was a feeling that medical students were hardly the Christian gentlemen whom the Victorians regarded, very rightly, as the proper people to fill professions. They all knew that the reformed public schools were following the example of Arnold and Kennedy and trying to turn their boys into Chistian gentlemen: why not insist on this same thing for all who were to become medical students? They could not all go to public schools, but they could be taught the same things, and tested by examination. Unfortunately, they misunderstood the process: it was not the things taught, but the life lived, in a public school that mattered, and the scheme missed fire. It did worse than that, because the well-intentioned notion of substituting 'useful knowledge' for subjects which would be of no 'use' to a doctor fairly soon destroyed the cultured literacy so many of them had possessed, and complaints increased every year of the medical students who could not express themselves, write English or spell. In 1890 the Army claimed the right to reject candidates for the medical service on grounds of illiteracy: in 1920 the G.M.C. complained that "only three out of 13 seemed able to write good or decent English" in an examination.

The important thing in medical education in the latter part of the century was the beginning of the change from simple clinical medicine at the bedside to the medicine of the laboratory. This started with the revolution in surgery: after the introduction of antiseptics a large development became possible. This increased the volume of the subject to be learned, but did not add a great burden to the student because for one thing it was antiseptic technique which mattered, and for another the details of operative technique concerned only surgeons, though the tradition of standing and watching in operating theatres lingered as a minor educational pest till the 1930's. Antiseptic surgery, however, also started bacteriology, and from the

time of Lister's laboratory under the stairs in the old King's College Hospital in the late '70's laboratory bacteriology, and ultimately bacteriology teaching laboratories, developed steadily. The change-over from simple clinical medicine, in which the doctor found the signs for himself, to laboratory medicine, in which he made his diagnosis from the reports which pathologists and radiologists sent him, did not develop till the next century, largely because the accessory sciences were not sufficiently elaborated until then. The first science, oddly enough, to be given provision, was chemistry, a subject far too under-developed to be of major value to medicine. In the first half of the century any reference to "practical" chemistry (or any other subject) means demonstrations in the lecture theatre; and "laboratories" mean labratories in which the teacher prepared his demonstrations, as in the case of the laboratory built for the Professor of Chemistry at Cambridge in relation to the new lecture theatre in 1832, or did his own original work. Laboratories in which students worked came much later. At St. Bartholomew's the first laboratory was the one for practical chemistry built in 1886, followed by a bacteriological laboratory in 1890, and in 1891 by laboratories for public health, the pathology of preventable diseases, and biology. The physiology and physics laboratories were not added until 1899. The great effect of medical school laboratory work in the 19th century was the change they produced in the minds of the medical profession. As Hector Cameron said in 1948: "in 1867 the number of surgeons with minds educated to appreciate the value of scientific evidence was small. Scientific habits of thought were not then, as now, diffused throughout the medical profession" (Life of Lister p.71). There may be plenty of non-scientific doctors still, but the profession, as such, is now essentially scientific, and with the increasing power and danger of specific remedies it is a good thing that the scientific foundations were laid so long ago. The other half of a doctor's business is the handling of people, which is not scientific, and there will always be something to be learned from the example set in this respect by the 19th century which produced the great healers, of one of whom it was said that when he left the bedside of his patient and said in measured tones "You will get well", it was like a message from above.

References

Except where given in the text, the references will be found in "Evolution of Medical Education in the 19th Century". Oxford University Press, 1957.

Book Reviews

RECENT ADVANCES IN OTO-LARYNGOLOGY, by F. Boyes Korkis. Third Edition, pp: 438, figs. 144: Published by J. and A. Churchhill Ltd. Price 60s.

Otolaryngology has advanced so far and so fast in the nine years since the previous edition of this book that it is virtually a fresh book. It retains the form of a review of the literature and present practice on certain fields of the speciality. In some, notably that on benign nasal polyposis and acoustic trauma a careful description of the pathology of the lesion preceeds the section on treatment. Particularly to be recommended, and worthy to be studied by neurologists and general physicians, is the wonderfully clear chapter on Otoneurological tests and labyrinthine disease, in which the status and varying techniques of testing are clarified with authority. The chapters upon malignant disease, its classification and treatment as carried out in this country will be of particular interest to readers from countries who are not fortunate in sharing our high standard of radiotherapy, who find our emphasis on this form of treatment puzzling.

The territory of the otolaryngologist is expanding, and the sections upon the facial nerve, the oesophagus and the salivary glands emphasise that these subjects are within his province and that he has definite contributions to make.

There are a number of important fields that have been left out of this volume and it is to be hoped that we shall not have to wait another nine years for the next edition to be forthcoming.

BIOCHEMISTRY IN RELATION TO MEDICINE, by C. W. Carter, R. V. Coxon, D. S. Parsons and R. H. S. Thompson. 3rd Edition. Longmans, Green & Co. Ltd., pp. 600. Price 50s.

For this third edition the original authors, Carter and Thompson, have been assisted by two of their colleagues and produced a book of far greater scope than the previous editions. They claim in the preface that the book is now designed for students of biochemistry and physiology as well as of medicine, although whether the requirements of all these students can be combined in a relatively small book is doubtful. In fact this book still contains a strong medical bias and although the chapters on intermediary metabolism are now much fuller and more critically written, this only brings them up to the standard of modern medical school practice. Although this book is not intended as a novel, one is struck by the fact that it improves as one reads further through it. The early chapter on physical principles and methods is so condensed that it is really a chapter suitable for revision rather than initial learning, and the next three chapters on the chemistry of the carbohydrates, liquids and amino-acids and proteins are also brief. From this point onwards the book improves and reaches its peak with the chapter on the digestion and absorption of fats in which the previous theories are reviewed and the modern theories (post-Frazer) are presented with remarkable clarity. It is a pleasure to see that the authors have included sections on oxygen and carbon dioxide transport, body fluids and electrolytes and kidney function. These subjects are included in the biochemistry curriculum in the United States but in this country they are usually taught by the physiologists in a manner that might be described as "classical" and generally found confusing by the student who has been taught the modern theories of electrolytes in his biochemistry course. Apart from its scientific content this book can be recommended for the clarity of the language and of its formulae and diagrams, although the reader will find the scheme of the Krebs cycle on page 308 misleading, as all the stages of the cycle are shown as being reversible whereas, in spite of careful investigation, the decarboxylation of α-ketoglutarate is apparently irreversible so that the cycle as a whole cannot function in an anticlockwise manner. This edition is also supplied with a bibliography which will serve as a useful introduction for anyone wishing to read further on a particular topic.

J.C.C.

SYNOPSIS OF TREATMENT OF ANORECTAL DISEASES by Stuart T. Ross, M.D., F.A.C.S. London: H. Kimpton. pp. 240, 1959. Price £2 8s. 6d.

This well produced book gives a clear account of the management of diseases of the anal canal but only a sketchy description of the treatment of diseases of the rectum, since it is not concerned with abdominal surgery. The surgery of the rectum is usually and correctly linked in this country with that of the colon and mostly involves an abdominal approach. A better title for the book would have been "The Treatment of Diseases of the Anus and Anal Canal" and there would then have been no need for the use of the misleading word "synopsis". It might still have included its comments on the diagnosis of rectal disease. In America the "anorectum" is often defined as the anal canal and distal 2 cms. of the rectum but the author evidently has not accepted this narrow definition.

The treatment of diseases of the anal canal as described differs only in minor details from the common practice in this country. It advocates use of a special "proctologic tip table" for sigmoidoscopy and describes the useful left lateral position. In addition, it advises 2 enemas one hour before sigmoidoscopy, something which may alter the appearances to be seen and adds presumably to the discomfort of this often simple procedure. The author does not appear to have heard of the work on the anatomy of the anal canal published from St. Mark's Hospital in 1955 and 1956 and mentions the subcutaneous external sphincter muscle in many instances when he means the internal sphincter, a difference important since it is the difference between voluntary and involuntary muscle.

W.M.K.

HEALTH PERSONAL AND COMMUNAL by John Gibson. Publishers: Faber & Faber. Price 12s. 6d.

That this book should be called "Health" rather than the conventional "Hygiene" raises hopes of an original approach to the subject, and these are not disappointed. Though simple in style and presentation, Dr. Gibson is original in concept and material. Descriptions of the curious mechanisms by which our forefathers introduced air into houses, of outmoded sewage traps and by-gone grades of milk have been omitted, and the author writes of prevention of infectious disease and of the nurse's specific health problems. Simplification has been carried to extremes in some cases; for instance, the vitamins (page 30) should have their individual functions ascribed to them, and the reviewer would like to see more than one paragraph given to the pressing problems of mental health. The author is not afraid, however, of presenting his views firmly, as when he advises nurses not to smoke at all, and tells us of the alarming consequences of wearing in bed a wristwatch with a luminous dial.

W. E. Hector.

PSYCHOLOGY, THE NURSE AND THE PATIENT (3rd Edition), by Doris M. Odlum, M.A. (Oxon.), B.A. (Lond.), M.R.C.S., L.R.C.P., D.P.M., Dip. Ed. Published by Iliffe & Sons Ltd. Price 15s.

Miss Odlum sets out, in the third edition of "Psychology, the Nurse and the Patient", to cover the psychological requirements of the Preliminary and Final Examinations for the State Registered Nurse. She has revised and expanded this edition and has produced a book which would interest all grades of nursing staff in general hospitals.

She discusses the part psychology has to play in the everyday life of nurse and patient. The psychological make-up of the individual is considered from an inborn and developmental point of view. The chapters concerned with psychological theory are interesting and well written. I would like to have seen this section expanded further as McDougall receives the lion's share while other equally important schools of thought are referred to only briefly.

The simple, clear account of normal emotional development should help nurses appreciate the needs of patients of all ages who come within their care. Psychosomatic disorders are well illustrated with patient's histories.

Patient's emotional reactions to illness and hospitals are described. The author thinks most patients fall into the "tough" category, accepting and adapting to their changed circumstances with comparative ease. The "tender" patients constitute 30-40 per cent. These can be further sub-divided into "anxiety-prone", "obsessional", "histrionic"

and "inadequate". Whilst making each type recognisable, I think a nurse reading this chapter might fall all too easily into erroneous "pigeon-holing" and "labelling". This practice is both inaccurate and to be deplored.

Miss Odlum describes, with insight gleaned from obvious personal experience as a patient, the many practical problems peculiar to the patient. She stresses the psychological as well as the physical effect of noise at night; draughts down the patient's neck, lack of privacy, etc. All these are well-known to the nurse, yet frequently forgotten in practice.

The author does a service to the psychiatric patient, whose care is increasingly frequently carried out in the General Hospital. A brief description of psychoneurosis, psychosis, current treatment and advanced mental care are given, and act as an excellent introduction, which may stimulate the reader to enquire further into this field.

This book will be of use to different nurses for varying reasons. Student Nurses will find a simple, lively description of material which will help them on the wards and in the Examination Room. Tutors should find many sections useful, especially the chapters concerned with psychological theory. Ward Sisters might think some of the examples as "stating the obvious" which has been well known over the years. This is true yet the full psychological impact is not always appreciated. They may think Miss Odlum's idea of a "mature, wise, tolerant, devoted, consecrated "mother figure", difficult to live up to. A more realistic approach to the senior sister's difficulties and problems, in the same way that patient's and student nurse's problems were considered, would have enabled student nurses to reach a better understanding and thus co-operation with the Sister in the work on the wards.

E. Skellern.

The Challenge of General Practice

With this as his title, Dr. T. O. McKane of Dunmow, Essex gave a lecture to final year students on June 5th. He began by saying that about 50 per cent of Bart's men go into general practice and a large part of the remainder into public health, industrial or hospital medicine. Many such specialists are no longer familiar with the problems confronting the family doctor, being completely without experience in that field themselves, but it would be well for all to work in close accord. The problems of today offer a challenge to attain a high standard of medicine. In former days, the family doctor knew most of the people in his district, knew the local gossip and a great deal of the background, but there was a barrier between doctor and patient. As travel, by horse and trap, was slow, and communication, by letter or messenger, was slow also, and as the doctor charged a fee for each visit or consultation—though he did not seem to worry if his account was not paid— many major conditions were often relatively advanced when first brought to him, and minor conditions were hardly seen at all. But today, new remedies have made it possible, and indeed advisable, to treat at home many patients who would previously have gone to hospital. Hence amongst others the number of old people and chronics who require constant care has greatly increased. Public health measures and improved standards of living have wiped out much disease, and protective innoculation especially has almost eliminated smallpox and diphtheria and has greatly reduced whooping cough. It is to be hoped that poliomyelitis will similarly disappear.

In 1948, the introduction of the National Health Service meant that the doctor was paid by the State, and now neither he nor the patient have any worries on that score, but on the other hand, there is practically no limit to the demands the patient may make. Hence the general practitioner is consulted more frequently and by more people, often for very early illness and for comparatively mild infections. The importance of early diagnosis can hardly be overstated, and this is another aspect of the challenge of general practice. The more care and sympathy he gives up to a point, the more consultations he has, not necessarily from new patients, but from his chronics and neurotics. The number of psychological difficulties and near neuroses is legion. One must learn to introduce *some* resistance, a barrier of a different kind, between oneself and some of these patients, in order to have time to deal with the important issues of the day, and to have something to spare for one's family and for other interests. Hospitals are used by the family doctor to investigate serious illness, to confirm a diagnosis, or to obtain treatment and skilled nursing care which may be beyond his own resources. One of the great differences between general and hospital practice is that, in the former, the patient has to be treated in his own home, and his family, his work and his environment are all part of the picture, whereas in hospital he is away from all these troubles until his treatment is complete.

Dr. McKane then described his own rural practice of three partners, based on a village of 3,000 to 4,000 inhabitants, and extending for a radius of five miles, with further extensions along four main roads to a distance of eight or nine miles.

The area probably holds about 14,000 people. There is another surgery in a smaller village, and two call-houses at strategic points. He and his partners are on excellent terms with a similar three-man practice in the same area. He travels between 400 and 450 miles a week by car, allows one hour to visit four patients, and one hour to see eight or twelve in the surgery. He showed some tables from Vol. 1. of the "Morbidity Statistics from General Practice" published by H.M. Stationery Office in 1958. In one year 15,738 consultations were given, an average of 2.4 for every patient on the list, or of 4.5 per patient consulting, 53.2 per cent of all patients being seen in the course of the year, and having between them 6,018 illnesses. Admissions to hospital were 214, which was 32.4 per 1,000 patients on the list, and 35.6 per 1,000 illnesses—a relatively small number out of the 6,605 patients in the practice.

The medical student preparing for general practice should realise that most of the cases he will see are not those with which he is familiar in hospital. He has been taught the principles of medicine and surgery, and physical signs and symptoms have been studied often on cases that offer well-marked and obvious examples. Many of these are rare in any single general practice. The most important every day subjects with which he must be familiar are the psychology of the normal and of the physically ill patient, the neuroses and the tension states, the common difficulties in handling the normal and the sick child, dermatology, and upper respiratory infections including otitis media. The young doctor starting in practice is soon confronted with the time problem, and will have to work out for himself a careful system of priorities. That is the challenge to good medicine in the general practice of today.

In conclusion, he referred to the Student Attachment Scheme, in which 1,300 doctors up and down the country are willing to allow students to "sit in" on their work for anything up to three weeks at a time. Every student, no matter what his future may be, would be well advised to take advantage of this scheme, and to see, in the type of practice and the part of the country most congenial to him, something of what the general practitioner does, and of the variety of clinical material. On the second Wednesday in September, Dr. McKane is arranging a visit for senior students to his own practice, where they will be able to meet other practitioners, the County Medical Officer of Health, Secretaries, Dispensers, Health Visitors, District Nurses, and the Duly Authorised Officer and apart from all that, they will be in the hands of an excellent host.

Sports News

VIEWPOINT

It is a recognised fact that every sporting club in the hospital must have both a president and vice-presidents. They are elected entirely from the staff of the hospital, and on the whole have either been proficient in the sport concerned, or otherwise have shown a lively interest in the game. The duties of the president and vice-presidents towards any club are not defined, apart from the fact that the president has to preside at any meeting that may be held. Recently, there seems to have been a certain amount of discontent amongst a few clubs at the seeming lack of interest, not only by the presidents but also by the hospital staff in general, in the activities of the club. Perhaps a recent example of this trend was the U.H. cricket cup final, which took place in September on three perfect days. The total support from the hospital on those three days, excluding students was four housemen, one registrar and one vice-president, in spite of the fact that the event was widely advertised in the hospital, and that the ground was only a fifteen-minute journey from the hospital.

It must be said that some clubs are more than satisfied in the support they receive. But it seems a great pity that hospital sport does not attract as much attention as it formerly did.

RUGGER

Cornish Tour, 1959

The opening match of the tour against Penzance and Newlyn was played under good conditions despite a slight drizzle. Both packs appeared evenly matched in the early stages, but the speed and penetration of the Penzance three-quarters were a constant danger. The opening score came after a break by G. Lush who sent his winger in for an unconverted try. Bart's fought back, and G. Halls kicked a long penalty goal from the half-way line to equalise. However, a further converted try by Penzance made the half-time score 8-3.

In the second half, the Bart's tackling became erratic, and the three-quarters line never got moving. Penzance scored two further tries through bad marking, and then Bart's forwards struck back, and forced Penzance into cross, a penalty was awarded under the Penzance posts, but the kick was taken too quickly in an attempt to score a try. The final score was 14-3 to Penzance.

The team then travelled to Devonport for the Monday game against the Services XV. With Stevens injured, Britz was brought up to the centre position, with Ross at full-back, and Clive Charlton returning to scrum-half. Soon after the start of the game, a quick break by the Services' centre led to a try, which was quickly followed by another. This unsettled the Bart's team to such an extent, that after this they were never really in the game. The Services maintained a fast pace throughout the match, with backs and forwards interpassing delightfully. Scores were frequent, and only a great solo run by G. Halls enabled Bart's to cross the Services' line. The final score was 39-3. Reasons for the defeat were not hard to find—lack of cohesion between the pack and three-quarters, shadow tackling and poor defensive covering. Even the loss of A. P. Ross through injury in the second half, could not account for everything.

For the final match of the tour against Brixham R.F.C., Bart's had to put out a much changed team. Stevens, Ross, Britz, Hamilton and Jennings were not available, so L. R. Thomas made his debut as full-back, with Neely, Kilroy and Chapman playing their first game on tour.

For the first half-hour, Bart's played well. The pack were lively, and the halves saw plenty of the ball. However, no score resulted and the game gradually swung in Brixham's favour. They scored one before half-time, and afterwards took advantage of some erratic kicking and tackling, to score a further 18 points without reply. R. R. Davies, the Bart's captain, was injured early on, and spent most of the game hobbling on the wing.

Despite their defeats on tour, the prospects for the rest of the season are not as black as they may seem. Many new players have been tried and will have benefited from the experience gained. G. Halls has proved an outstanding success at wing-forward and M. Jennings and P. Niven have been excellent acquisitions. However, the second row positions have yet to be filled adequately, and the three-quarter line so far possesses little thrust.

1st XV v. Woodford, on 10th October, at Chislehurst.—Lost 6—16.

With the first rain of the season, making the top surface of the ground greasy, Woodford kicked off, and were soon attacking in the Bart's 25. The play for the first 10 minutes was fairly even, but Woodford soon scored a try which was duly converted, so giving them the lead. Bart's were playing very badly at this time, but a good three-quarter movement to the left wing gave S. Harris a good run with Stevens taking the final pass to score. Pennington was unsuccessful with the kick. Woodford were soon on top again, and a penalty gave them an 8-3 lead at half time.

Just after the start of the second half, Stevens kicked a penalty, but from then on Bart's deteriorated and Woodford ended with a victory 16 pts. to 6.

Team: M. Britz, S. Harris, J. Stevens, J. Bamford, N. Burbridge, R. R. Davies, A. P. Ross, B. O. Thomas, M. Jennings, J. Pennington, G. Halls, J. Hamilton, L. R. Thomas, A. Kilroy, P. Moynagh.

1st. XV v. Cambridge LX Club, on 14th October, at Cambridge. Lost 6—28.

The Hospital kicked off and immediately the LX Club were in possession and carried the ball right to the Bart's line. Some very keen defence kept them from scoring, but their constant pressure produced a fine try which was unconverted. Bart's slowly began to settle down, but were soon a further 3 points down before Burbridge went over in the corner after a very good three-quarter movement. Stevens failed with the conversion. Bart's began to play more as a team, and levelled the score 6-6 with a penalty kick by Stevens. Just before half-time, Cambridge scored once more, so the teams crossed over, Bart's 6, Cambridge 9. After half-time, play was all in favour of the LX Club, and their superiority in every aspect of the game was very soon apparent.

Team: P. Niven, S. Harris, J. Stevens, J. Bamford, N. Burbridge, R. R. Davies, A. P. Ross, B. O. Thomas, M. Jennings, J. Pennington, J. Hamilton, J. Irvine, L. R. Thomas, R. Jones, G. Halls.

1st. XV v. Old Blues, on 24th October, at Chislehurst. Lost 3-6.

The club, after their promising display against Rugby, were anxious to record their first win of the season, and playing with the wind were very soon in command of the game. However, the attack was never quite strong enough to cross the opponents line, and it was midway through the first half before G. Halls opened the scoring with a very fine long penalty kick.

The second half began in a similar manner, but the Bart's superiority tailed off, and the O. Blues forced a line-out on the goal line from which they levelled the score with a try.

Bart's immediately went back into the attack, and were unlucky not to score in the corner. The game was slowly drawing to a close, when the O. Blues in the last minute gained a scrummage within the Bart's 25. From the scrum, they scored a good try in the corner.

G. Halls at open side played a very fine game both in attack and defence, whilst M. Britz entertained the spectators with some unusual but effective methods of fielding the ball.

Team: M. Britz, C. Richards, J. Stevens, J. Bamford, P. Niven, R. R. Davies, A. P. Ross, B. O. Thomas, M. Jennings, A. Knox, J. Irvine, J. Hamilton, A. Kilroy, L. R. Thomas, G. Halls.

LADIES' HOCKEY

Bart's v. London Hospital, on Saturday October 10th.—Won 2—1.

Bart's v. St. Mary's Hospital, on Saturday, October 17th.—Won 3—2.

Bart's v. Queen Mary College, on Saturday, October 24th.—Won 6—1.

This was the preliminary round of the University of London tournament and Bart's lived to fight another day. We were delighted to have Dr. and Mrs. Blunt supporting us from the touchline.

Our opponents were unfortunate in being one short until just before half-time. Bart's were on the attack most of the time. In the first half Miss Hartley scored twice, and Miss Swallow, in her inimitable way, shot a splendid goal from the edge of the circle.

In the second half Bart's maintained the pressure. Miss Hartley scored again and Miss Minns shot one which bounced into the net off one of the Q.M.C. defence; the captain, too, surprised herself and the rest of the team by scoring. The Bart's goal ably kept by Miss Tomkins was penetrated only once.

Team: I. Tomkins, P. Kielty, J. Tufft, T. Coates, E. Knight, S. Cotton, S. Swallow, S. Minns, E. Clements, J. Hartley, J. Arnold.

ASSOCIATION FOOTBALL

1st XI v. Royal Naval College, Greenwich, (Away) on Wednesday, 7th October. Lost 1—5.

A considerably re-shuffled team, mainly due to injuries from the previous match, took the field at Greenwich. The Bart's goal was soon under pressure and Bart's were unlucky to see the ball reach the net via a defender. The whole team, however, were generally far too slow on the ball, tackling was poor and distribution hazy. Consequently before half-time the Naval College had added to their score.

Things were no better in the second half; two more goals went against us before Iregbulum ran the ball into the net for a consolation goal. Play was generally scrappy allowing our opponents to notch another one before the final whistle went.

It was evident from this match that Bart's lacked fight and any desire to win, qualities which are necessary to bring out the talent which is undoubtedly latent in the team.

Team: J. Davies, F. Amponsah, G. Haig, B. Perris, D. Prosser, M. Williams, A. Andan, P. Watkinson, L. Iregbulum, T. Herbert, M. Waterworth.

1st XI v. Lancing Old Boys (Home), on Saturday, 10th October. Lost 0—3.

After a promising start, Bart's lapsed badly and

Last year's victorious Hockey Team: there are only a few changes this year.

Back Row: J. Tufft, J. Hartley, J. Chambers, S. Minns, J. Arnold, T. Coates, E. Knight.
Front Row: Dr. Lehmann, Professor Wormall, I. Tomkins, Dr. Blunt, J. Hall.
On the ground: J. Swallow, M. Childe.

turned in a rather poor display. Pressing hard in the early minutes we forced three corners from one of which Phillips headed on to the bar. Following this the Bart's goal was almost continually under pressure mainly because of the lack of cohesion in the team especially between the half-backs and forwards; counter-attacks were rarely launched. At half-time the score sheet was still blank but in the second half Lancing pressed even more strongly and were rewarded with a goal following a succession of corners. Their score was soon added to, which instead of stimulating the Bart's team into activity seemed to make them more apathetic. Davies again gave a good display while Amponsah was strong in defence.

Team: J. Davies, M. Noble, F. Amponsah, B. Perriss, D. Prosser, M. Williams, J. Jailler, B. Hore, L. Iregbulum, H. Phillips, P. Savage.

A.F.A. Junior Cup—1st Round Replay

1st XI v. Ealing Association Reserves (Away) on Saturday 17th October—Won 2—1.

This was our first win of the season appropriately allowing us passage into the 2nd round of the A.F.A. Junior Cup. Kicking off with a blustery wind in our favour the team settled down quickly and produced its best football so far this season. Less individuality was apparent, our efforts being soon rewarded with a goal. A typical long ball from Prosser started the move which incorporated Hore and Phillips before Iregbulum was sent away to score with a powerful left-footed shot. Bart's soon got another goal when Iregbulum rounded his man and half-volleyed the ball into the net. Bart's continued to play good football and at half-time the score was still 2-0.

Turning round, we seemed to lose a lot of our cohesion and Ealing came much more into the game. The defence, however, remained firm, Prosser being especially prominent, but some ten minutes from the end, Ealing scored following a corner. Within minutes the ball was again in the Bart's net but, luckily their right winger was offside. With this let-off we managed to hold out until the final whistle.

Team: J. Davies, G. Haig, D. Prosser, J. Jailler, C. Juniper, B. Perriss, P. Savage, B. Hore, L. Iregbulum, H. Phillips, J. Kuur.

1st XI v. Swiss Mercantile College (Home), on Saturday, 24th October. Lost 2—6

We again welcomed this attractive team to Chislehurst who besides displaying a crisp, continental style of football also gave us our annual language test. Unfortunately during the first half the Bart's team seemed fascinated by the repeated verbal commands between the members of the opposition, that little effort was expended trying to counteract the quick, incisive moves of the Swiss. So little wonder that at half-time we were 4-0 down. However, a stern disciplinary talk by our captain, Prosser, infused some determination into the team during the second half. Although the Swiss soon notched another goal, straight from the kick-off Kuur burst down the left wing and while cutting in towards the goal was fouled inside the penalty box—Iregulum scored from the spot. Soon after, during a goalmouth mêlée, Iregulum again propelled the ball into the net. At this time Bart's seemed to be holding their own but hopes of a great comeback were squashed when in the closing minutes the Swiss College scored again.

Team: J. Davies, F. Amponsah, D. Prosser, J. Jailler, C. Juniper, B. Perriss, B. Hore, P. Savage, L. Iregbulum, H. Phillips, J. Kuur.

Other Results: 1st XI v. Chartered Accountants (Home)—Lost 0—2. 2nd XI v. Guys Hospital 2nd XI (Away)—Lost 0—6.

RECENT PAPERS BY BART'S MEN

*ABRAHAMS, Sir Adolphe. The use and abuse of drugs by athletes. *Brit. J. Addict.*, 55, July, 1958, pp. 23-27.

ADRIAN, Lord. Our concern for the mind. *Brit. med. J.*, July 25, 1959, pp. 78-81.

ASTON, J. N. Bilateral club hands. *Proc. roy. Soc. Med.*, 52, July 1959, p. 576.

—— Multiple and grossly comminuted fractures left tibia—amputation on the right. *Proc. roy Soc. Med.*, 52, July 1959, p. 576.

*BETT, W. R. Carl Ludwig Schleich. *Nursing Mirror*, 108, 11th September, 1959, p. xiii.

Henry Hancock (1809-80): the first successful operation for appendicitis with spreading peritonitis. Eugene Aram (1704-59): scholar and murderer. *Med. Press*, 242, 5th August, 1959, pp. 116-117.

*—— Johann Malfatti Elder von Montereggio (1775-1859). Physician to Beethoven and the Duke of Reichstadt. *Med. Press*, 242, 9th September, 1959, p. 217.

*—— Narcolepsy and its treatment. *Med. Press*, 242, 9th September, 1959, pp. 215-216.

*—— Oliver Wendell Holmes. *Nursing Mirror*, 108, 28th August, 1959, p. xiii.

—— Phenothiazine derivatives in the treatment of mental disorders: a review of recent work. *Med. Proc.*, 5, 22nd August, 1959, pp. 359-362.

—— Sir George Adlington Syme (1859-1929). *Med. Press*, 242, 15th July, 1959, p. 47.

*—— Sir Marc Armand Ruffer (1859-1917): pathologist, Egyptologist and administrator. *Med Press*, 242, 19th August, 1959, pp. 159-160.

—— Theobald Smith (1859-1934): the Pasteur of American medicine. *Med Press*, 242, 22nd July, 1959, pp. 84-85.

—— Thomas Masterman Winterbottom (1766?-1859) of 'Winterbottom's sign'. *Med. Press*, 242, 8th July, 1959, p. 32.

*—— Trends in medical literature: a retrospect. *J. Indian med. Prof.*, 6, June 1959, pp. 2674-2675, 2678.

BICKFORD, J. A. R. (and Miller, H. J. B.). Exchange of patients by mental hospitals. *Lancet*, 8th August, 1959, pp. 96-97.

BORRIE, Peter. Sturge-Kalischer-Weber syndrome (encephalotrigeminal angiomatosis). *Proc. roy Soc. Med.*, 52, July 1959, p. 553.

—— (and Jones, B.) Staphylococcal granuloma, rosacea, uveitis and conjunctival cicatrization. *Proc. roy Soc. Med.*, 52, July 1959, 553-554.

*BROWN, J. R. (and Thornton, John L.) William Odling as Medical Officer of Health to Lambeth. *Med. Offr.*, 102, 21st August, 1959, pp. 77-78.

CATES, J. E. (with others). Carcinoid heart diseases. *Brit. Heart J.*, 21, July, 1959, pp. 369-380.

*COHEN, E. Lipman. Cosmetics and the skin. *Brit. Encyclop. med. Pract.*, Interim Supp. 202, July 1959.

*COPPLESTONE, John F. The employment of diabetics. *Brit. J. industr. Med.*, 16, 1959, pp. 170-175.

CRADOCK-WATSON, J. E. (and others). TRIS buffer for the demonstration of haemoglobin A2 by paper electrophoresis. *J. clin. Path.*, 12, July, 1959, pp. 372-373.

de MOWBRAY, R. R. (and others). Steroid therapy in hirsutism and virilism. *Brit. med. J.*, 19th September, 1959, pp. 456-459.

DISCOMBE, George. The differential diagnosis of haemolytic anaemias. *Postgrad. med. J.*, 35, Sept. 1959, pp. 448-493.

*DONALDSON, Malcolm. Cancer and the family doctor. *Med. World*, 91, August 1959, pp. 109-112.

*—— Cancerphobia and the medical practitioner. *J. Coll. gen. Pract.*, 2, August 1959, pp. 293-295.

*FALLIS, L. S. (and Barron, J.). Colostomy closure by intra-peritoneal method. *Dis. Colon Rectum*, 1, November - December 1959, pp. 466-470.

* (and Barron, J.). Management of post-gastrectomy syndrome. *Proc. Wrld. Congr. Gastroent.*, 1958, pp. 1063-1066.

FENTON, J. C. B., *see* CRADOCK-WATSON, J.E., and others.

*FLETCHER, C.M. (and others). The significance of respiratory symptoms and the diagnosis of chronic bronchitis in a working population. *Brit. med. J.*, 29th August, 1959, pp. 257-266.

*FRENCH, G. E. Toxoplasmosis. *Canad. med. Ass. J.*, 80, 1st June, 1959, pp. 910-912.

*GILLIES, Sir Harold. Plastic surgery in naval cases. *J. roy. Nav. med. Serv.*, 45, Winter, 1959, pp. 7-46.

*HADFIELD, John. The effect of hormone deprivation upon breast cancer. *Ann. roy. Coll. Surg. Engl.*, 25, July 1959, pp.1-19.

*HADLEY, R. M. The life and works of Sir William James Erasmus Wilson (1809-84). *Med. Hist.*, 3, July 1959, pp. 215-247.

HAMBLY, E. Primary tumour of the patella. *Proc. roy. Soc. Med.*, 52, July 1959, p. 576.

—— Yaws osteoperiostitis of fibula. *Proc. roy. Soc. Med.*, 52, July 1959, p. 575.

HAMILTON, W. J. (and others). Another case of quadruplets. *J. Obstet. Gynaec. Brit. Emp.*, 66, June 1959, pp. 409-412.

*HANBURY, W. J. Pathological factors in the prognosis of bronchial carcinoma following surgical excision. *Tubercle*, 40, August 1959, pp. 257-264.

*HINDS-HOWELL, C. A. Gas-poisoning. *Med. Press*, 242, 5th August, 1959, pp. 107-109.

*HOWELL, Trevor. Some physical causes of mental symptoms. *Geront. clin.*, 1, 1959, pp. 132-136.

*—— Work study in a long stay hospital. *The Hospital*, July 1959.

HUBBLE, Douglas. William Ogle of Derby and Florence Nightingale. *Med. Hist.*, 3, July 1959, pp. 201-211.

HUNTER, Richard A., and MACALPINE, Ida. An anonymous publication on vaccination by John Conolly (1794-1866). *J. Hist. Med.*, 14, July 1959, pp. 311-319.

*JONES, R. F. McNab. Destruction of the superior maxilla in Felty's syndrome. *J. Laryngol.*, 73, June 1959, pp. 388-391.

KING, R. C. (and others). Chronic ulcerative colitis in childhood. *Arch Dis. Childh.*, 34, June 1959, pp. 257-261.

LEHMANN, H. (with Santos, W. D. dos) Acetazolamide in sickle-cell anaemia. *Brit. Med. J.*, 8th August, 1959, pp. 139-140.

—— (with others). Persistence of haemoglobin "Bart's" beyond infancy in a child with thalassaemia. *Brit. med. J.*, 5th September 1959, pp. 248-349.

*—— (with others). A simple colorimetric method for estimating serum pseudocholinesterase. *Clin. chim. Acta.*, 4, 1959, pp. 384-390.

—— (with others). Stanleyville I and II. Two new variants of adult haemoglobin. *Brit. med. J.*, 29th August, 1959, pp. 282-284.

—— *see also*, CRADOCK-WATSON, J. E., and others.

LOXTON, Geoffrey E. Concerning the cause of cancer. *Med. Press*, 242, Part I, 12th August, 1959, pp. 130-133; Part II, 26th August, 1959, pp. 174-178; Part III, 2nd September, 1959, pp. 191-196.

*LUMB, George (and others). The cardiac conduction tissue and its blood supply in the dog. *Amer. J. Path.*, 35, 1959, pp. 467-487.

MACALPINE, IDA, *see* HUNTER, Richard A., and ——.

McILROY, M. B. The clinical uses of oximetry. *Brit. Heart J.*, 21, July 1959, pp. 293-314.

McINDOE, Sir Archibald. Development of plastic surgery in Great Britain. *St. Mary's Hosp. Gaz.*, July-August, 1959, pp. 111-114.

*MacKENNA, R. M. B. Acne vulgaris. *J. med. Wom. Fed.*, 42, July 1959, pp. 136-140.

MEDVEI, V. C. *see* de MOWBRAY, R. R., and others.

*MOURANT, A. E. The use of haematological data as a source of anthropological information. *Proc. 7th Congr. Int. Blood Transfusion, Rome*, 1958, pp. 259-262.

*MUNRO-FAURE, Honor. Necrotizing arteritis of the coronary vessels in infancy; case report and review of the literature. *Pediatrics*, 23, May 1959, pp. 914-926.

MURRAY, P. D. F. The voyage of the "Beagle". *New. Biol.*, No. 28, 1959, pp. 7-24.

*O'CONNELL, J. E. A. The place of surgery in the management of intractable pain. *Brit. J. Surg.*, 46, May 1959, pp. 608-615.
*OSWALD, N. C. Morale at the Base. *J. roy. Army med. Cps.*, 105, July 1959, pp. 97-101.
*PERKINS, E. S. Discussion on low-tension glaucoma. *Proc. roy Soc. Med.*, 52, June 1959, pp. 429-436.
*QUILLIAM, J. P. Paraldehyde and methypentynol and ganglionic transmission. *Brit. J. Pharmacol.*, 14, June 1959, pp. 277-283.
*—— (with others). Some pharmacological properties of the α-toxin of staphylococcus pyogenes. *Brit. J. Pharmacol.*, 14, March 1959, pp. 59-67.
*REES, Lindford. An evaluation of the role of emotional factors in miners' nystagmus. *J. Psychosomatic Res.*, 3, 1959, pp. 291-302.
*—— The role of emotional and allergic factors in hay fever. *J. Psychosomatic Res.*, 3, 1959, pp. 234-241.
*—— The role of stress in the aetiology of psychosomatic disorders (abridged). *Proc. roy. Soc. Med.*, 52, April 1959, pp. 274-278.
*RENBOURN, E. T. The history of sweat and the sweat rash from earliest times to the end of the 18th century. *J. Hist. Med.*, 14, April 1959, pp. 202-227.
*—— The history of sweat and prickly heat, 19th-20th century. *J. invest. Derm.*, 30, May 1958, pp. 249-259.
*ROBINS, R. H. C. The ankle joint in relation to arthrodesis of the foot in poliomyelitis. *J. Bone Jt. Surg.*, 41B, May 1959, pp. 337-341.
ROBINSON, A. M., *see* de MOWBRAY, R.R., and others.
ROSS, Sir James Paterson. The scientific approach to surgery. *Brit. Med. J.*, 11th July, 1959, pp. 26-29.
RYAN, E., *see* LEHMANN, H. (with others).
SPENCE, A. W., *see* de MOWBRAY, R. R., and others.
*TODD, Ian P. The treatment of haemorrhoids. *Practitioner*, 183 July 1959, pp. 33-37.
*TURNER, J. W. Aldren. Carcinomatous neuropathy. *Brit. J. clin. Pract.*, 13, July 1959, pp. 499-502.
*VARTAN, C. Keith. Breech presentation and delivery. *Clin. Obstet. Gynec.*, 2, June 1959, pp. 390-399.
*WEBER, F. Parkes. Miscellaneous notes (Third and Fourth series). 1959.
WEITZMAN, David (and Smith, E. B.). Ischaemic electrocardiograms in symptomless men, with a note on the serum lipoproteins. *Brit. Med. J.*, 15th August, 1959, pp. 162-166.

*Reprint received and herewith gratefully acknowledged. Please address this material to the Librarian.

ST. BARTHOLOMEW'S HOSPITAL JOURNAL

Vol. LXIII No. 12 DECEMBER. 1959

EDITORIAL

Efficiency is a word much used in our 20th century vocabulary. Everything in an expanding population, in overcrowded cities where work seems to increase (according to Parkinson's Law?) must run efficiently if there is not to be a considerable wastage of quantities of time, temper and ultimately money. This principle must apply not least to hospital organisation, where the increase of work in an expanding Welfare State is real (and not according to Parkinson's Law!) and for which there is not a limitless supply of all kinds of staff.

Efficiency in hospital administration has recently been reviewed by the methods of Work Study which have long been used in industry. Attention to this matter has probably been stimulated by the sight of endless wage spirals with which the administration cannot cope indefinitely. The Westminster Hospital has been at the forefront of these developments, and according to the principles of Work Study the syringe service was examined: five technicians were employed and their output averaged 500 syringes and needles a day. The work was broken down into 101 "operations" which on analysis could be reduced by 42 (which were shown to be unnecessary operations). The estimated result: the production of 900 syringes and needles; the result in practice was the production of 1,300 a day with a reduced staff of three. The saving: £1,200 recurring annually and £736 from a reduction of syringe stocks.

A figure of this order may seem small, but there are few limits to the expansion of Work Study methods. Langthorne and Whipps Cross Hospitals (totalling 1,950 beds) viewed with dismay the prospect of a 10 per cent wage increase for domestic staff: a Work Study investigation showed an estimated saving of several thousand pounds. At Guy's, the laundry was investigated and among the results achieved was a reduction in the time cycle per machine of 25 per cent. Again, the Westminster Hospital reviewed the state of washing up in their largest nurses' home: this is a process involving many people for hours. Reduced handling of crockery made the procedure quicker and breakages fewer, and with improved equipment resulted in an annually recurring saving of £1,170.

The success of Work Study at the Westminster Hospital has resulted in widespread interest. A most satisfactory outcome is the delegation of authority to Regional Boards to appoint one Work Study officer. While one such officer per region may appear to be little more than an acknowledgement, it is a recognition of the fact that these methods have come to stay. A brief survey of 12 hospitals throughout the country (11 of them

teaching hospitals), chosen at random, has shown what might be considered representative of the interest in this subject. Without exception, they all have some scheme under way, and several already have results. Edinburgh reported that "... there is no doubt that the whole department is much more alive and much more on its toes than it ever has been before ..."

The limitations of the methods must also be realised. Human frailties do not permit man to work like a machine, and there will always be inefficiency and increased numbers of "operations" through forgetfulness and fatigue and for this reason the application of work study must necessarily have a limiting factor.

One has also become aware of the fact, that with increased availability of equipment, for example, there is an increase of usage, and consequent reduction of the apparent efficiency. The example to hand is that of the syringe service already described: production rose considerably, but so did consumption which certainly suggested that now that they are available, more syringes are used than absolutely necessary. In fact, in this case the needles were not always sharp, and this instance provides a warning that quality should not be sacrificed to quantity even for the sake of efficiency.

It is most important, too, that the organisers of Work Study schemes, in hospitals or anywhere else, should always remain aware of the fact that a scheme successful one year may be useless the next. The introduction of new techniques and machines can alter the picture very quickly, and Work Study schemes must keep abreast of such developments, or they will become outdated very rapidly. It can therefore become an extremely expensive occupation in itself and must be organised so efficiently that the cost of the services rendered does not equal or exceed the savings effected by its methods.

Ultimately the methods of Work Study will be extended to a detailed investigation of the ward unit, which is essentially the most important and the most complex unit of any hospital. Already some hospitals have investigated nursing methods: the London for example, was able to introduce the new 44-hour week smoothly and without upset. Following the ward unit, the logical conclusion is the design of efficient new hospitals. Bristol Infirmary has investigated an acute surgical ward in this way, and intend to plan their hospital extension accordingly. It is after all important that the entire space relationships of any building should be governed by the principles of Work Study—which cannot be said for many recently constructed buildings. It is most fortunate that Work Study methods are being established at a time when many major building schemes are being initiated, and it is only a pity that the Ministry of Health cannot be persuaded to take more interest in the opportunities they afford.

One does not need a very acute power of observation to notice where Work Study might be useful. The nurses trail to the Dispensary and wait; the students spend hours walking to the Path. Lab.; the patients spend hours waiting to be seen by students then by doctors; the working of the "coloured" boxes in which apparatus is ill-placed, and instruments in short supply leaves much to be desired. These are just a few instances which spring to mind—there are many others. When will Work Study visit us?

* * *

Another important development of efficiency in hospitals is the introduction of various forms of Call Systems. Some of these are described in an article to be found elsewhere in this Journal.

GENETICS AND MEDICINE

The emphasis of this issue of the Journal is on some of the genetical aspects of medicine. It is important that members of the medical profession should maintain some interest in current genetics which advance with great rapidity. As our knowledge of heredity increases, the possibility of predicting the acquisition of disease is becoming much more frequent; as such predictions become more certain, so a new and very real social problem is going to arise in which married couples wanting children may be faced with some difficult decisions, and doctors and advisory councils will find it increasingly difficult to give helpful or constructive advice. This may seem rather futuristic, but the trend is rapidly in this direction, and certainly cannot be prevented. It may also be possible that with an increased knowledge of heredity, there may evolve ways of controlling it, indeed one might well expect this to be the case. The first task, however, is to acquaint ourselves with the facts before us.

Fifty Years Ago

A report appears in the Journal of a case of rheumatoid arthritis treated by bee stings. The patient, who was a married lady of 32, had involvment of the wrists, elbows, knees and ankles. There was gross deformity and limitation of movement together with much pain and muscle spasm.

Dr. Herringham, having started the patient on a régime of electric baths, hot douches, massage and carbonate of guaiacol gr. xv t.d., tried the effect of bee stings:

August 26: "I got six bees and made them sting her left knee."

August 31: "Eight stings".

September 3: "Twelve stings, six to each knee . . . from that time she had a dozen bees twice a week until September 18, when I left off under the impression it did no good."

The patient was then put on formic acid injections but on October 1 asked for the bee stings to be started again as she found relief in them, although no permanent improvement resulted.

This appears to be the case already mentioned in these columns as being the subject of concern in the "halfpenny press". It seems that at the time of this case there was a Beekeepers' Exhibition in which an instrument for applying bees was shown and it is thought that the *Daily Mirror* learnt from this source of the use of bees at Bart's: "Anyway, the *Daily Mirror* was about our bed, and spying out all our ways in less than no time, and the Secretary of the Hospital looked at me from under his eyebrows, like Zeus, for he had to answer a sheaf of letters inquiring about it!".

Ruddigore

The Gilbert and Sullivan concert on November 20 was this year produced and conducted by Christopher Hood, and certainly does him considerable credit. If one considers that the basic material which he has had to mould into a chorus is very largely composed of those who on the whole have very little to do with music, the achievement is all the more remarkable. The whole performance was alive and spirited, and presented the audience—which on the whole was rather slow to respond—with a most enjoyable evening. The Gresham Hall was packed to capacity, and one was pleased to see a large number of staff there. It is a pity that more domestic productions of this kind are not seen at Bart's: "G. and S." is all that is left of the many theatrical productions and concerts which used to be seen and heard during each year.

The chorus this year was again a good size (almost 100 strong), but perhaps rather lacking in vitality. The women outnumbered the men considerably, but for all their size the body of sound was disappointingly weak; by contrast, the smaller band of men were much more alive and seemed to have much more control over the music. The balance of the whole was therefore good.

The talents of the soloists—an all Bart's cast—were remarkable indeed. Congratulations must go to Gwilym Michael, singing for the first time at a Bart's concert, for his outstandingly spirited and yet controlled performance as Richard Dauntless. George Hobday as Sir Ruthven Murgatroyd sang with a power and vitality which were even better than last year, and Wendy Roles singing the part of Rose, the village maiden, once again delighted the audience. *In sailing o'er life's ocean wide*, sung by this trio in the first act was one of the highlights of the evening, and deserved more response from the audience than it in fact got. John Creightmore, now familiar to the Bart's "G. and S" productions, sang the part of the wicked baronet, and excellent as his singing was, he was not wicked enough, nor was Mad Margaret convincingly mad as portrayed by Nancy Watts, who has a pure and too gentle voice for a hysterical woman. The Murgatroyd ghost was excellently sung by Nick Roles, and one was sorry not to hear a little more of him—or of Sally Clarke who sang the part of the bridesmaid Zorah exquisitely. David Wells as Old Adam Goodheart sang most competently, and Vanessa Jones in the part of Dame Hannah, after a rather shaky start, found her form in *There grew a little*

flower. The whole production was held together by the talent of Dr. Lehmann who delighted the audience with his inimitable delivery of the story.

The orchestra, larger than ever before, under the able leadership of Sylvia Watkins, accompanied admirably, although there was a tendency (so common among amateurs) to drown the soloists, despite the sometimes audible efforts of the conductor to keep it down. One was pleased to notice that although it was supplemented by outsiders, many of the players were from Bart's.

The evening ended with the traditional party, at which the spontaneous cabaret was quite outstanding.

This same evening, the engagement of Christopher Hood to Alison Clair was announced, and we would like to take this opportunity to congratulate them, and wish them every happiness.

Abernethian Society

"A new approach to diagnosis" was the theme of the lecture given by Mr. de la Warr of Oxford on November 19. A new approach it is indeed. Its basis is the power of mind over matter (a common enough phenomenon), the connection between them being some form of "vibration" of fixed (and empirically determined) frequency. The usefulness of this technique is to be found in diagnosis, in which one can "tune in" to the affected organ, and discover the disease. All that is required of the patient is a specimen of blood, a hair, or a photograph, which is inserted into the machine.

Mr. de la Warr continued to demonstrate the power of mind over matter with a series of photographs apparently made by exposure in the machine to the sample from the patient, and pictures resembling tuberculous lungs or cancerous stomachs made in this way were shown.

The power of the mind to affect cellular multiplication was also demonstrated by series of photographs of plants: the control plants consistently proved to be smaller than those which had been stimulated by thoughts mediated through this "machine".

These ideas are certainly new and strange. One is disappointed to find that systematically planned and controlled scientific methods do not seem to have been employed in many of the experiments. However, it is important that one should have an open mind when reviewing new phenomena, for many important discoveries have been suppressed for unnecessarily long periods because people have taken a dislike to their novelty.

The Harvey Society

On Monday, November 16, the Society enjoyed a rather gruesome lecture given by Dr. F. E. Camps, a Home Office Pathologist, entitled "Greed or too many Women!" The two cases discussed by Dr. Camps were those of Christie and Jack the Ripper. Although the victims in both cases were women the motives behind each group of murders were vastly different: Christie murdered while satisfying his sexual desires, whilst Jack the Ripper appears to have been a complete sadist with no sexual motive at all.

Two interesting medical points arose from the Christie case. All of the bodies were well preserved and as a high concentration of carbon monoxide was found in the blood stream of each victim it appears that this may act as a preservative. Also live spermatozoa were found in the last three victims which means that spermatozoa can live up to nine weeks in an environment with no enzyme action.

In the Christie case the murderer was caught and brought to justice, but the identity of Jack the Ripper still remains a mystery. Dr. Camps suggested that he might have been a member of the London Hospital Staff but it appears that guesses have become rather wild and even a counter espionage Russian spy has been considered.

That Dr. Camps has accustomed himself to the horrors of murder is apparent from his remark that "the only *really* macabre" part of the Christie case was the human femur used to prop up the trellis work in the back garden! In spite of, or because of this, the lecture was very well received by a large audience.

Christian Union

The first of the main Mission meetings in Bart's was the Lunch-Hour Service on Friday, November 13, addressed by a lively South London minister, The Rev. Brandon Jackson. The body of Bart's-the-Less was full to hear him talk on the claims of Jesus Christ to the ownership of our lives.

The second, on Tuesday, November 17, was equally well attended. The original speaker being unable to come, the noted solicitor, Mr. J. F. Wallace, was invited in his stead. He came willingly and, after a slow, hesitant opening, warmed to his extemporary task.

He took us through his life as a youngster around our age and made us think of the escapisms in which the modern world indulges, and how Christians in particular face up to realities. Very tellingly he spoke of the way he realised his own foolishness in living apart from Jesus Christ and, eventually, had thrown in his lot with Him. In a most challenging way he reminded us that none could sit on the fence, either one is for Christ, and all He stands for, or against Him, being pawns in the hands of Satan. He gave no quarter for the agnostics for, as he said, this in latinised form becomes "ignorami" and who wants to be known as an ignoramus?

B.J.S.

The Journal

We would like to wish our readers a very Happy Christmas, and a most successful New Year.

We are pleased to be able to present this Journal in the correct month, very nearly back to its schedule. This has been made possible by the very close co-operation of the printers, Messrs. Groves, Brodie and Co., Ltd., of Slough. We hope that the January issue will appear on time.

The omission of a Calendar in this Journal is because the November issue was published only a little while ago and already covers the necessary period.

IN OUR LIBRARY—THE NEW LOOK

by John L. Thornton

When I entered libarianship thirty years ago I found that the requirements for part of the examinations to be passed before one became a chartered librarian included a study of library planning. Apparentlyit is the ambition of every librarian to design and plan his own library, to arrange the various departments in accordance with generally accepted rules, to provide adequate lighting, heating, furniture and fittings, and to preside over a library attractive in appearance, superior to any other similar building. Unfortunately, few librarians achieve this ambition, and particularly since the war few new library buildings have been erected, modifications and adaptations being the rule. Special libraries are generally housed in buildings devoted to other purposes, so that external planning in relation to site seldom comes within the province of this type of librarian. However, internal planning is most important, and who better than a trained librarian to design and furnish a library?

Twenty-one years ago I came to Bart's, and at a meeting of the Library Committee suggested improvements in the lighting and heating of the Library. I requested lights in four alcoves where for some obscure reason none had previously been provided, and one over the clock above the fire, around which readers were wont to congregate. A member of the Committee visited the Library the very next day, declared that "they never had lights there when *I* was a student; why should they want them now", and departed. With the aid of a length of wire and the necessary gadgets I proceeded to rig up the light over the clock, which remained in that position until recently.

During the war all the opaque panes of glass in the windows except two were destroyed, and I hoped that clear plate glass might now be introduced. I was informed that the windows had to be reinstated as before, failing which war damage money would not be forthcoming!

Working in the Library for twenty years provided ample time to study the problem of its renovation without destroying its essential character, which dates from the erection of the building in 1879. I visited every medical library of note in this country, and many special and public libraries, looking forward to the day when the turn of our library should come. In official quarters it was always "next"! Eventually plans were prepared, revised, scrapped, and re-made. Work was actually started on June 30, and the Library re-opened on October 5.

The Library was rewired, which made possible the provision of extra lighting units, power points, and a flourescent display over

one end of the gallery, which was extended to cover two new offices, one for the librarian, and the other for library staff. The old desk was removed from the centre of the Library, modernised, extended by means of a counter, and placed near the exit, around the offices. The two radiators in the centre of the room and the two gas fires were removed, to be replaced by five Flexaire heating units. These are heated by hot water, the warm air being fanned out at one end of each unit. Three chandeliers suspended from former ventilating shafts in the centre of the room provide general lighting by means of eight bulbs to each unit, and adequate light for both reading and illuminating bookcases is provided in every alcove, with two fittings over the fireplace. This latter has been cleaned, and an electric fire placed therein as a centrepiece. The clock has been converted to electricity.

All the large tables in the centre of the room have been removed, and the catalogue and current periodical display racks have been placed on the heating units. New lino has been laid in squares of alternate grey and rosewood marbled tiles, which suggests greatly increased width on the ground floor; the gallery floor was covered with sheet rosewood-coloured lino. All the lino was laid on hardboard to deaden noise.

The ceiling was painted in pale grey with the supporting girders in white, and the majority of the oak woodwork was stripped and polished. The opportunity was taken of dusting the books and rearranging certain of these. The current textbooks and reference books, together with the volumes for the past five years of the most used journals, are now located on island stacks just inside the Library.

These alterations obviously entailed great expense, and the refurnishing of the Library was not executed concurrently. We hope to have new chairs throughout the Library, a few study desks, two exhibition cases and certain office equipment in the near future. The Library will then be more comfortable for readers, better lighted and heated, and the provision of extra shelving space will facilitate the better display of the stock.

It is generally agreed that the library premises are a great improvement upon what was previously provided, particularly as regards lighting and heating, although there are naturally criticisms of certain features and details. One is astonished to discover how many people have ambitions to plan and design libraries. The problems involved are not merely questions of colour and decor, although the aesthetic aspect cannot entirely be neglected. Librarians must be even more concerned with the distribution of lighting; the best use to be made of available space for readers, stock and display; the dimensions of counters, staff rooms and furniture; and space for future growth, as libraries expand at an astonishing rate, mainly by means of annual additions of periodicals. One cannot lightly discard these costly items, which often increase in monetary value as the sets lengthen.

The ideal library has yet to be planned. It must remain a dream in which walls can be made of elastic, furniture and fittings never date or wear out, and every reader has immediately to hand all the information he requires. The librarians' ambition must remain just that—a dream!

THE TEACHING OF PSYCHIATRY AND PSYCHOLOGICAL MEDICINE

*An Extract from the B.M.S.A. Annual General Meeting, November, 1959**

After the results of the 1956 questionnaire into the clinical curriculum had been studied, the seventeenth Annual General Meeting of the British Medical Students' Association directed its Education Officer to investigate the teaching of Psychiatric and Psychological Medicine in Great Britain.

Data for this report, just published, was collected by means of a questionnaire, the factual information for which was obtained as far as possible from official sources at schools, while the student opinion was assessed from discussions either with large groups of students or with as many individuals as possible. Of the twenty-seven medical schools in Great Britain, replies were received from seventeen, among which Bart's was not included.

Eleven schools reported that a course in normal psychology was given, while the pattern of the teaching of psychiatry in different schools varied enormously according to the apparent importance attached to the subject. The most regular feature of the teaching programme was the lecture, but half of the schools indicated that no formal in-patient ward rounds were arranged and attendances at psychiatric out-patient clinics varied between 0 and 26. In no school was a period of compulsory residency in a mental hospital or unit instituted.

The subject matter in the teaching of psychology centred on human behaviour and therefore served to introduce the student to clinical psychiatry techniques. Courses in psychiatry were devised to cover the more common mental disorders, the detail and degree of emphasis on each aspect of the subject depending on the time available for the teaching of psychiatry.

Student opinion as to the value of this teaching correlated closely with the time spent on the teaching. Where only short courses in psychiatry were given, students attached little value to them, while the opposite opinion was expressed by schools where the time given to psychiatric teaching was above the average. However, opinion was unanimous in the need for a more prominent place being given to psychology and psychiatry in medical education.

To every student the part that the mind plays in any disease is a factor with which he must reckon from the start of his training and thereafter as long as he practises medicine. It is recognised that physiology and anatomy are the basis of all medicine yet training in the functioning of the mind, which is often a controlling factor of physical disease, leaves much to be desired. Students recorded their experience of numerous cases of mild neurosis or psycho-neurosis in out-patient clinics and this undoubtedly led to the most outstanding criticism of psychiatric teaching, namely that the basic knowledge had not been provided. The incorporation of the teaching of both normal and abnormal psychology into the preclinical curriculum would prepare the student for the psychiatric teaching he ought to receive throughout his clinical training.

The General Medical Council in their recommendations on the Medical Curriculum in 1957 stated: "Instruction should be given in the elements of normal psychology . . . During his study of all clinical subjects the attention of the student should be continu-

* From a report compiled by Dr. R. N. M. Macsween.

ously directed by his teachers to the importance of the inter-relation of the physical, psychological and social aspects of disease.

These recommendations provide a sound basis for the teaching of psychological and psychiatric medicine. Without prior knowledge of the G.M.C. report, many students supplied suggestions incorporating these recommendations. With these in mind it is interesting to note the principal features of the new course in psychiatry and psychology to be introduced in Sheffield. Ten pyschology lectures will be given to preclinical students by the Head of the Psychology Department and these will be supported by lecture seminars on normal and abnormal psychology, with patients. (One is pleased to note the re-introduction of a psychology course into the preclinical curriculum at Bart's). During clinical training the greater part of the psychiatric teaching will be left to the final two terms when there will be weekly lecture demonstrations in mental hospitals. However, the students' introduction to psychiatry will be made during the introductory course. In the fourth year two social psychiatry seminars as part of the social medicine clerkship will be given and each student will take a clerkship in the Department of Psychiatry, as part of a Neurology-Psychiatric Clerkship, for one month. During both the fourth and sixth years weekly rounds in medical wards by the Professor of Psychiatry, will be held. The only psychiatric teaching in the fifth year will consist of two lectures to students doing midwifery.

With regard to examinations, the 2nd MB physiology paper will contain one obligatory question on psychology and the Professor of Psychiatry will examine with the Professor of Medicine in the final examination.

The "Sheffield Plan" introduces radical changes in the teaching of psychological medicine. Several years must pass before the results can be assessed, but ought the rest of the medical schools to wait for this assessment before bringing their own teaching programme up to date ?

J. A. H. BOOTES.

★ ★ ★

Change of address

MR. J. C. SPREY-LEVERTON, Cedar House, Barnack, Stamford, Lincs.

ANNOUNCEMENTS

Engagements

BALL—ROWE.—The engagement is announced between Dr. Michael J. Ball and Jacqueline M. Rowe.

CROSFILL—STEWART.—The engagement is announced between Dr. Martin L. Crosfill and Jean Stewart.

DOWIE—BUTTAR.—The engagement is announced between Dr. Lance Newton Dowie and Sine Buttar.

MANSELL—CHARVET.—The engagement is announced between Peter William Anson Mansell and Anne Caroline Dashwood Charvet.

PRICE—WOOLF.—The engagement is announced between Dr. David Glynne Price and Dr. Audrey Joyce Nadine Woolf.

Marriage

TRAPNELL—GRAY.—On November 14, David Hallam Trapnell to Mary Elizabeth Gray.

Births

GRETTON.—On June 20, to Dr. and Mrs. A. Howard Gretton, now of Daysland Alberta, a son (Adrian Ross), brother for Anne and Stephen.

HARCOURT.—On October 22, to Margaret and Dr. Brian Harcourt, a daughter (Jane Elizabeth).

MONKS.—On October 26, to Phyllis and Peter Monks, F.R.C.S., a third daughter.

PAGE.—On November 4, to Elizabeth and Dr. Arthur Page, a daughter (Susan Margaret), sister for Christina.

ROFFEY.—On November 9, to Anne, wife of Dr. Peter Roffey, a son (James Crispin).

ROXBURGH.—On October 25, to Muriel, wife of Robert Roxburgh, a son.

SHAIRP.—On November 4, to Jean, wife of Dr. Brian E. Shairp, a son (David Brian).

SINGER.—On November 9, to Mary and Dr. Geoffrey Singer, a daughter (Claire), sister for Alison and David.

Deaths

BREST.—On November 4, Dr. Simon Brest. Qualified 1925.

RIGBY.—On November 7, Dr. M. N. J. Rigby. Qualified 1894.

SATOW.—On September 29, Dr. Lawrence Lancaster Satow. Qualified 1911.

Research at Bart's

DEPARTMENT OF PHYSIOLOGY, I

Research work in several fields of physiology is in progress at the present moment and it is the purpose of this article to give a brief account of the work being carried out by each member of the staff.

Chemoreceptors

Studies of the cardiovascular reflexes initiated by stimulation of the chemoreceptors situated in the carotid and aortic bodies are being made by Professor M. de B. Daly and Dr. Mary J. Scott. They showed that when the carotid bodies, isolated from the circulation and cross-perfused from a donor animal, were stimulated by hypoxic blood the characteristic reflex hyperventilation occurred in the recipient animal together with variable changes in heart rate. The usual response was tachycardia, but sometimes bradycardia or no change in rate occurred. The cause of these variable responses was that the primary or direct reflex effect on the heart of stimulation of the carotid bodies was a bradycardia, but that this response was often masked by secondary cardioaccelerator mechanisms resulting from the concomitant reflex hyperventilation. These accelerator mechanisms are a stretch reflex from the lungs, being initiated by an increase in depth and rate of respiration, and a lowering of the arterial blood pCO_2

Mechanisms governing the changes in cardiac output (measured by the dye-dilution method) and total peripheral vascular resistance in response to stimulation of chemoreceptors are similar. The observed increase in cardiac output and fall in total peripheral vascular resistance are not the result of a primary reflex from the chemoreceptors, but are secondary to the effects of the accompanying reflex increase in respiration.

The changes in heart rate associated with stimulation of the carotid bodies are the same both in animals breathing room air and in those with induced hypoxia. These results are of interest with regard to the mechanism of the tachycardia occurring in systemic hypoxia produced, for instance, by inhalation of low oxygen gas mixtures because it has been generally assumed that it is the result of stimulation of chemoreceptors. It is evident from the above experiments that this cannot be the case.

Current work is continuing along similar lines. The mechanism of the tachycardia in hypoxia is still obscure because it has been found that it cannot be entirely accounted for by secondary effects of hyperventilation; the response still occurs under conditions of controlled ventilation. The mechanisms underlying the increase in cardiac output associated with this condition are also not yet fully understood.

The fact that emerges from this work is that although under controlled experimental conditions it can be shown that the chemoreceptors exert profound *primary* reflex effects on the circulation, these may be masked under normal conditions by events secondary to changes in respiration. This emphasizes the importance of taking into account effects from accompanying changes in respiration as potential mechanisms determining the observed responses of the cardiovascular system.

Haemodynamics

Other problems concerned with the circulatory system are being investigated separately by Dr. D. A. McDonald and Dr. D. H. Bergel. A study of the pulsatile pressure and flow in arteries is being carried out by Dr. McDonald. The work he has in progress is designed to provide a quantative basis for the analysis of the form of the pulse wave. With the rapid advance in technical equipment since the war efficient manometers are in general use and a large literature has grown up which shows how greatly the form of the pulse wave varies in various parts of the arterial tree and with varying physiological or pathological conditions. There is, however, relatively little agreement as to the cause of these changes, and without an understanding of the underlying physical principles relatively little information can be got from the records compared with the technical skill and effort involved.

The first step in such an analysis is to establish the relationship between pulsatile pressure and flow; the fact that measurement of pulsatile flow is much more difficult than that of pressure is the main reason that better progress has not been made previously. Physiologically it is the flow of blood

that is important and its pressure is only a secondary consideration. Ten years ago few reliable arterial flow measurements were available. Dr. McDonald and his colleagues developed a simple, but rather tedious, method of measuring flow in which bubbles of oxygen were injected into an artery and the rate of travel recorded by high-speed cinematography (a taking speed of about 1,500 frames/sec is necessary). These showed that the pulsatile variations in flow during the cardiac cycle were much greater than were supposed, and even involved a period of backflow in many arteries. They were fortunate at that time to secure the collaboration of a distinguished mathematician, Mr. J. R. Womersley, who derived the theoretical equations relating an oscillating pressure and flow in a tube. This is a general solution related to the well-known Poiseuille formula for constant flow. It is more complicated to apply because with the odd-shaped waves that the heart produces it is necessary to work out the flow for each frequency (or harmonic) component of the wave. However, they were able to show that the pulsatile flow could be predicted remarkably well from the pressure-gradient in an artery. Thus the gradient can be used as a method of measuring flow, without inserting a flowmeter.

The next set of problems were concerned with the behaviour of the waves as they travel along arteries. As blood has a considerable viscosity one would expect the waves to be damped out as they travel. Instead of that it is well-known that the size of the pressure-wave usually increases: for example, the pulse-pressure in the femoral artery may be over 50 per cent larger than that in the ascending aorta and in smaller branches it is larger still. This is due to the reflection of the pulse-wave from sites of branching, and by a series of experiments it has been shown that most of this reflection is in the region where the small arteries divide into arterioles. On present estimates some 30-40 per cent of the wave is reflected under normal conditions and ranges from about 20 per cent with marked vasodilation to 75 per cent with extreme vaso-constriction. One effect of this is that where the pressure pulsation is increasing the flow pulsation is markedly reduced.

The effects of the interaction of waves travelling away from the heart with reflected waves travelling towards the heart are complicated and the great part of this analysis has been due to Dr. M. G. Taylor, who has recently returned to Australia. However, it is possible to express the net result in terms of the "input impedance". This term was borrowed from electricity because the corresponding usage of "peripheral resistance" for the ratio of the mean pressure to the mean flow is so familiar. By analogy, the input impedance is the relation of pulsatile pressure to pulsatile flow, just as one talks of impedance in alternating current circuits. It is rather more involved, however, for the impedance is different for each frequency component of the pulse. To get more precise information from the impedance it is also necessary to know the effect of frequency on arterial elasticity—work which Dr. Bergel has in progress. By applying similar measurements of impedance at the root of the aorta it is also hoped that a satisfactory method of estimating the stroke output of the heart from pulse-wave recording in the proximal aorta can be developed.

Dr. Bergel's work in more detail is as follows. It has long been known that the pulse wave velocity is related to the elasticity of the arterial wall, but that in additon several other factors may be concerned. It is therefore important to know the elasticity of the vessel wall so that the influence of these other factors may be more clearly assessed *in vivo*. It might be thought that such measurements had already been made, but in fact most published work on vascular elasticity cannot be used owing to the absence of important data, for example the wall thickness of the specimen. For these reasons the following work has been carried out.

For a thin-walled tube of radius (R) and wall thickness (h), made of a material with Young's modulus of elasticity (E), the velocity of propagation (c) of a pressure wave is given by the formula:

$$c \equiv \sqrt{\frac{Eh}{2R\rho}}$$

which is known as Moens-Korteweg equation (ρ is the density of the liquid in the tube).

The question arises as to the proper value of (E) to be used in this equation. In common with other substances a piece of artery cannot extend instantaneously when loaded: the internal viscosity of the wall will result in a retarded response. The faster one attempts to stretch such a material the more force will be necessary, that is, it will be stiffer, and the further its movements will lag behind the force. The elastic constants of the artery have therefore been measured under both static and dynamic conditions, since the pulse wave itself is a rapid event.

The experiments so far carried out have been on excised specimens, but studies on vessels *in vivo* will be made later. An apparatus has been devised by which simultaneous measurements can be made of the diameter of a vessel and the pressure within it. These quantities are first measured during a very slow inflation to 240 mm Hg and then under dynamic conditions. This is done with a pump which develops small pressure oscillations of 5-10 mm Hg on a mean pressure of 100 at speeds up to 20 cycles per second. In brief the results show that most arteries are considerably stiffer even at 2 cycles per second than when measured statically. The dynamic modulus can be expressed as a percentage of the static and in round figures the average values for the four types of vessels studied are as follows: thoracic aorta 100 per cent, abdominal aorta 120 per cent, femoral artery 140 per cent and carotid artery 160 per cent. This means that the dynamic stiffness increases towards the periphery and would seem to be related to the amount of smooth muscle in the wall, and the actual figures obtained fit very reasonably with the pulse wave velocities quoted in the literature (4-5 metres/sec. in the aorta, which is about half that in smaller and more muscular arteries). The amount of phase-lag between pressure and dilation is remarkably constant in the different vessels and is also quite small, rising to about 10 degrees at 20 cycles per second, this will have the effect of attenuating the propagated oscillations by a small amount.

Literature covering some of the work described in this article may be found in the selected references given below.

(To be continued)

REFERENCES

DALY, M. DE B. and SCOTT, MARY, J. (1959) "The effects of hypoxia on the heart rate of the dog with special reference to the contribution of the carotid body chemoreceptors." *J. Physiol.* 145, 440-446.

SCOTT, MARY J. (1959) "The reflex control of the circulation by chemoreceptors." *Ph.D. thesis.* University of London.

MCDONALD, D. A. and TAYLOR, M. G. (1959) "The hydrodynamics of the arterial circulation." *Progress in Biophysics and Biophysical Chemistry*, eds. J. A. V. Butler and B. Katz, 9, 105-174.

AID TO PHARMACY

When Dilling made his novel law,
He overlooked a tiny flaw,
So Evans in his helpful way
Modified it thus to say—
An infant's need is very close
To the product of the adult dose
And child's next birthday age plus four.
Divided by, for luck, a score.
Though Evans had his share of fame,
The law still carries Dilling's name.

Capricorn.

ANIMAL FARM or DUCK EGG BLUES ?

Professor G-rr-d: We have all I suppose, been quacks at some time in our lives.
Dr. Sh--t-r: I can't pass duck eggs.

* * * *

INFLAMED WITH DESIRE

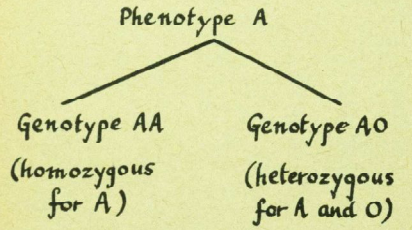
Kekulé . . . abandoned architecture for chemistry after hearing Liebig give evidence at an inquest on a hard-drinking countess whose death had been ascribed to spontaneous combustion.
(from the Proceedings of the Chemical Society, October, 1959.)

The Chemistry of Inheritance

"ONE GENE, ONE POLYPEPTIDE CHAIN"

by H. Lehmann

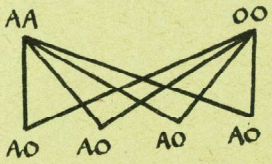
The discovery of sickle-cell haemoglobin (haemoglobin S) by Linus Pauling and his colleagues has been a most important step in the scientific progress of the 20th century. Of its many important aspects, not the least is the light it has thrown on the inheritance of a character determined by a single Mendelian gene. It has usually not been possible to know without study of the family whether a person who showed a dominant character was heterozygous or homozygous for the gene determining his character. For instance, it is not possible to say whether a person with blood group A is homozygous or heterozygous for the blood group A gene. The reason for this is that a person's phenotype may be different from his genotype. The phenotype A is what we see, i.e. it comprises those inherited characters which find expression in the living individual. The genotype comprises the genes a person has inherited, and which he can transmit to the next generation. It is not necessary that all these genes find expression in the phenotype. Thus, if a person has blood group A, this phenotype A may be associated with the genotype AA or AO respectively. If inherited with the gene for blood group O, one gene for blood group A can do the work of two.



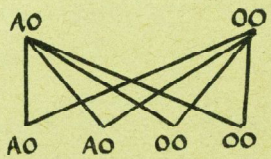
The Phenotype for blood group A may be based on either one of the two genotypes

Only family study can decide which of the two possible genotypes, AA and AO, is responsible for the phenotype A. For example, if a person with blood group A is married to one with blood group O and they have only blood group A children, it is likely that he is homozygous for the A gene. If, however, some of the children have blood group A and some have blood group O, he must be a heterozygote, possessing genes for both blood group A and blood group O. Similar considerations apply to the inheritance of the abnormal haemoglobins. Most adults only possess normal adult haemoglobin—haemoglobin A. These people are homozygotes for the gene controlling the production of haemoglobin A. There are some people who possess two adult haemoglobins, for example, the normal A and the abnormal sickle-cell haemoglobin—haemoglobin S.

In the case of the sickle-cell gene it had been recognised by clinicians that there were two distinct phenotypes, both possessing the gene for sickling, those who were healthy, and those who suffered from the disease of sickle-cell anaemia. Family studies carried out independently by J. V. Neel in America, and by E. A. Beet in Northern Rhodesia had made it likely that sickle-cell anaemia was the homozygous state, and that the symptomless sickle-cell trait was the heterozygous condition. These conceptions were put on a firm biochemical basis when sickle-cell haemoglobin was discovered. Pauling and his associates showed that the sickle-cell anaemia patients were indeed free from haemoglobin A—the normal adult haemoglobin—and that the sickle-cell trait



I. Genotype AA (homozygous). All the children have blood group A

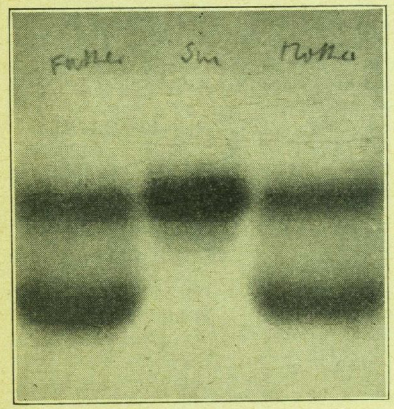


II. Genotype AO (heterozygous). Not all the children have blood group A, therefore the A parent must be a heterozygote

carriers possessed both normal adult and sickle-cell haemoglobin. It was thus possible to make a genotype diagnosis in the laboratory without a family study.

For practical purposes, this diagnosis of a genotype by examining the blood of a sickler for the presence or absence of haemoglobin A came to grief because of the existence of a gene which can cause suppression of the production of haemoglobin A, but not of haemoglobin S. This gene, the thalassaemia gene, can be inherited together with haemoglobin A, and the resultant condition, sickle-cell thalassaemia, may show an absence of haemoglobin A although a gene for this pigment is present. The phenotypes of the sickle-cell homozygote and of the heterozygote for haemoglobins S and A who have also inherited the thalassaemia gene may therefore be virtually identical.

Haemoglobin S was discovered by electrophoresis. In this technique, proteins are dissolved in a buffer solution, and an electric current is passed. When the pH is alkaline, the protein will then move towards the pole carrying the positive



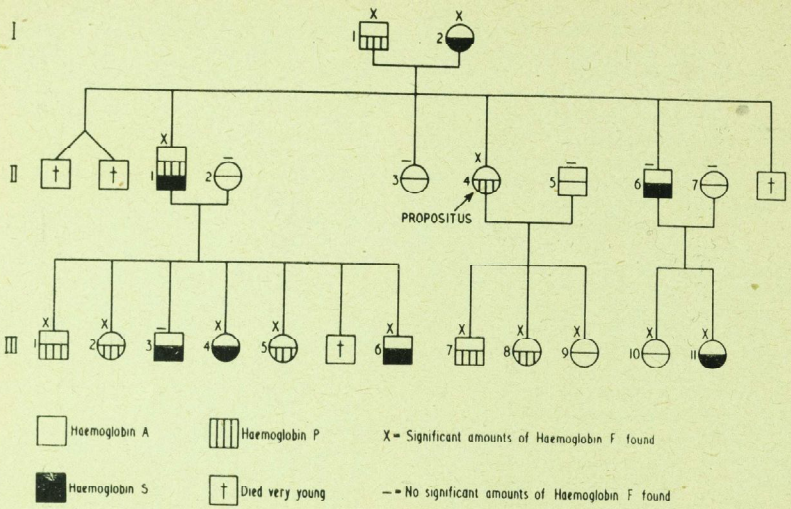
Electrophoretic pattern in Haemoglobin C Disease.
Patient (CC) middle, parents (AC) either side.

charge, and the speed of its movement will depend on the over-all charge of the particular protein. Haemoglobin S is less positively charged than haemoglobin A and will, at a pH on an alkaline side of this iso electric point, move more slowly towards the positive pole

By the technique of electrophoresis, haemoglobin S and numerous other abnormal haemoglobins, D, E etc. were discovered. Nearly all of them were inherited on strict Mendelian lines, just like the sickle-cell haemoglobin, but there were some exceptions. Foetal haemoglobin did not fit in the pattern of inheritance of adult haemoglobins. It is present at birth, and normally disappears in the first months of life. It cannot be controlled by a gene situated at the same locus of a chromosome which is occupied by those for haemoglobins A, S, and C. These haemoglobins are "allelomorphs", because they are inherited characters controlled by allelic genes, i.e. by genes which, though different from each other, occupy the same locus of a chromosome. One chromosome can carry only one of these genes, and two chromosomes no more than two. As the chromosomes are inherited in pairs, one from each parent, an individual cannot have more than two allelomorphic characters. As foetal haemoglobin is found in addition to haemoglobins A and S, or A and C, or S and C, or in homozygotes for A, S, or C, the gene responsible for its production cannot possibly occupy the same locus as the A, S, C genes. Haemoglobin F is, in fact, chemically quite different from all the adult variants. It has a different ultra-violet spectrum, it is more resistant to alkali denaturation, and whereas the adult variants cannot be differentiated by immunological methods, antisera can be prepared which specifically precipitate either the adult haemoglobins, or foetal haemoglobin. Not all the adult haemoglobins, of which there are now some two dozen known, are allelomorphs of S and C. With colleagues from the Congo, we studied a family where three adult haemoglobins were present in one person, namely haemoglobins A, S, and P. Thus, P and S cannot be allelomorphs. (see family tree, p. 331) Similar observations have been made by Neel and his colleagues, as well as by some workers in Baltimore and in North Africa, which already suggested that there was more than one gene responsible for adult haemoglobin.

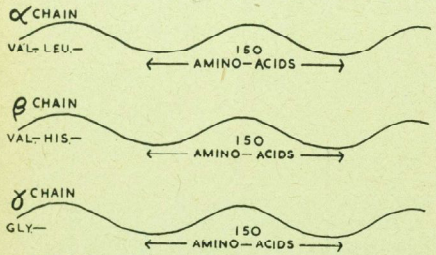
New light has been thrown on the genetical relationship of human haemoglobins by the study of the haemoglobin molecule, largely by Ingram in Cambridge, and Schroeder in California, and their associates.

Horse haemoglobin is an ellipsoid of the following dimensions: 55 x 55 x 70 Angström Units. Human haemoglobin is thought to have a rather similar shape, with a mole-



A family with the adult haemoglobins A, S, and P.

cular weight of 66,700. X-ray crystallographic studies have shown that the molecule is composed of two equal parts, symmetrically arranged. In each half molecule there are approximately 280 amino-acids each arranged in two polypeptide chains α and β. Haemoglobin S differs from haemoglobin A only by one amino-acid: one glutamic acid in haemoglobin A is replaced by a valine in haemoglobin S. The loss of the positive charge associated with glutamic acid, and not present in the neutral valine, explains the difference in electrophoretic behaviour of the two haemoglobins. In haemoglobin C, the same amino-acid is replaced by lysine. Other haemoglobins are substituted at different places of the same β- or α-chain. Haemoglobin F has either the α-chain as haemoglobins A, S, C and so forth, but the other chain is quite different from the β-chain of adult haemoglobin. The difference is so marked that this chain of foetal haemoglobin has been named γ-chain. It is now possible to understand why the differences between haemoglobins A, S, C, and so forth cannot be picked up by immunological methods. They involve only one of some 280 amino-acids. But, in the case of foetal haemoglobin, at least one-half is entirely different from adult haemoglobin. The change-over from foetal haemoglobin to adult haemoglobin is the change from combining the α-chain with the γ-chain to combining it with the β-chain.



The three polypeptide chains of human haemoglobin

One molecule of globin contains four chains

Normal adult haemoglobin = $\alpha_2\beta_2$
Normal foetal haemoglobin = $\alpha_2\gamma_2$
Haemoglobin H = β_4
Haemoglobin Barts = γ_4

Ingram has proposed that adult haemoglobin production is controlled by two genes rather than one, one gene responsible for the α-chain and the other responsible for the β-chain. This would explain that haemoglobins S and C are allelic. One cannot possess haemoglobins A, S and C together, because one can only inherit two β-chain genes from one's two parents. If, for example, one of these is that for a normal β-chain the other can only be one of the other possible β-chains—A, S, C etc. There is no room for three types of β-chain. On the other hand, if one inherits from one parent an adult haemoglobin with an abnormality of the β-chain, and from the other parent a haemoglobin with an abnormality of the β-chain, one should be able to produce three haemoglobins, or even possibly four. In the case of the family (see family tree) where one individual possesses three different adult haemoglobins, namely A, P, and S, this could be explained if, unlike in haemoglobin S, when the abnormality is in the β-chain, that of haemoglobin P was in the α-chain. In this particular instance, the man with the three haemoglobins would then have inherited a normal β-chain and an abnormal α-chain with haemoglobin P, and a normal α-chain and an abnormal β-chain with haemoglobin S. He could thus form his three adult haemoglobins P, S, and A as follows:

abnormal α-chain + normal β-chain = haemoglobin P
normal α-chain + abnormal β-chain = haemoglobin S
normal α-chain + normal β-chain = haemoglobin A

There seems to be, in this case, no combination of abnormal α-chain + abnormal β-chain.

An entirely different type of haemoglobin abnormality has recently been elucidated. The abnormal adult haemoglobin H did not fit in with the other adult variants. It was not inherited in strict Mendelian fashion. It has now been shown, by Schroeder and his colleagues, that haemoglobin H is in fact normal adult haemoglobin without the α-chain. People with haemoglobin H produce more β-chain than α-chain and have, therefore, in addition to haemoglobin A ($\alpha + \beta$), sufficient β-chain left over to form a pure β-chain haemoglobin by itself.

An abnormal foetal haemoglobin was discovered at St. Bartholomew's Hospital, and therefore called haemoglobin Bart's. It is now known that this abnormal foetal haemoglobin is not rare, and occurs fairly frequently in Chinese and Siamese. For instance, in a recent survey of 415 specimens of cord blood from Bangkok, 5 per cent showed haemoglobin Bart's. This pigment is now known to be a pure γ-chain haemoglobin. It is, therefore, an exact foetal counterpart of haemoglobin H. A family has been studied recently, in collaboration with Dr. Ramot and her colleagues in Israel, in which in two members, a mother and her daughter, haemoglobins H and Bart's occurred together. This suggests that there exists a gene which suppresses the formation of the α-chain and causes a surplus of the two others.

Most of our present knowledge on the biochemical genetics of pigments has been derived from plants, but one can truly state that the discovery of the sickle-cell haemoglobin by Linus Pauling, and its chemical analysis by Ingram, have called forth an advance in the studies of human protein which widens, or possibly overtakes, the progress made by the plant biochemists.

Family Histories

SOME OBSERVATIONS MADE IN GENERAL PRACTICE

by L. S. Castleden

The other day a colleague interested in the treatment of infertility wrote to me about an old patient of mine who had moved into his area and sought his help. The gynaecologist said that the girl had mentioned that five of her brothers had died of an obscure disease when quite young—was this disease a familial one?

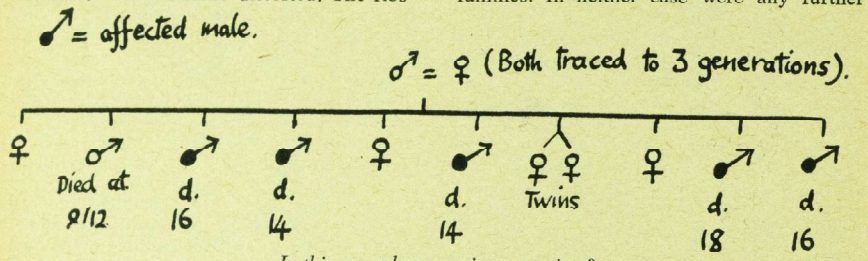
I had no difficulty in recalling the family. I remembered calling to see the last two of these boys some ten years ago. Propped up in a corner of the room were two pathetic paralysed and distorted figures. They were unable to feed themselves or do anything except talk and swallow with difficulty. The boys were then aged 16 and 18 years. Three other brothers were already dead at ages 16, 14 and 14 years and the survivors, being fully intelligent, realised their position. The five sisters were unaffected.

In all cases the history was the same. At the age of 6 or 7 the boys, previously healthy, noticed that they could not climb stairs or ladders. In two cases they had fallen in the school playground and sustained fractures—femur in one case and humerus in another. There was evidently not much actual pseudo-hypertrophy noticed. Quite rapidly wasting

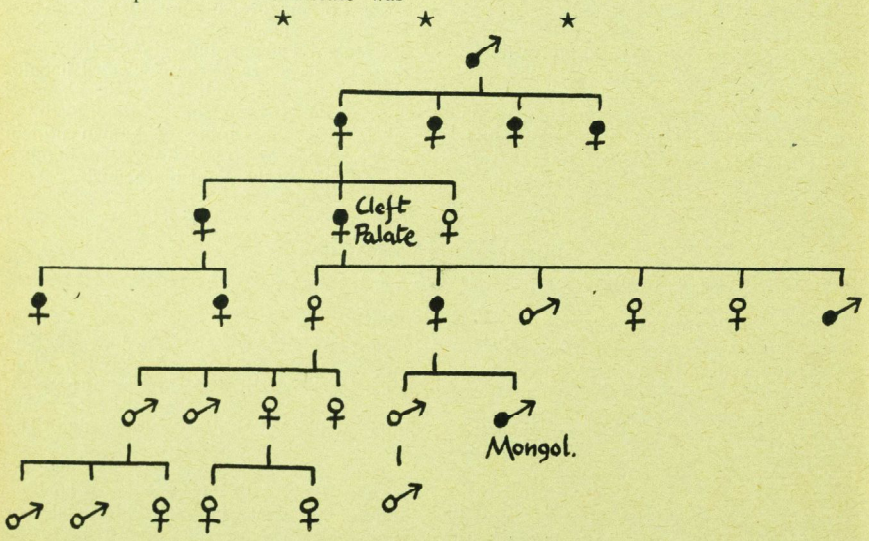
of the calves and thighs became marked. At the same time the muscles of the upper arm and shoulder became wasted. The growth of both upper and lower limbs was retarded and as different muscle groups were stronger than others the bones became distorted. The ribs also were pulled upon by the diaphragm, which was the latest muscle to be affected, so that their thoracic cages were grossly distorted. The two patients I knew died of bronchopneumonia and choking respectively within a few months.

One of the boys was seen at Bart's by Dr. Hinds Howell who was then neurologist. He was of the opinion that the disease was pseudohypertrophic muscular dystrophy.

An attempt was made to discover if any of the family had been affected in previous generations. Both grandparents were alive and could recall their own grandparents' families. In neither case were any further cases brought to light and no cousins were affected. It was considered, however, that there was likelihood of the male children of the girl members of the family exhibiting the disease and they were warned of the risk to their children. So far none have borne children and treatment of the girl with infertility was not pursued.



Is this a newly occurring mutation?



In the case of an abnormality apparent at birth such as web fingers, a family tree can be pretty rapidly compounded. In the above family it will be noticed that two of the affected persons have other developmental defects. The unaffected persons do not appear to pass on the defect.

Genetical Aspects of Psychiatry

by LINFORD REES

In the past prolonged but fruitless controversies were centred on whether particular diseases were determined either by heredity or by environmental influences. This "either/or" concept of the role of nature and nurture in the causation of disease has now been replaced by the modern concept of complex interrelationships and interactions between genetic and environmental factors. It is, indeed, rare to find that either heredity or environmental factors are alone determinative in mental disorders.

Genes produce their effects by controlling enzyme actions and biochemical processes in the body and their actions cannot be considered in isolation as they are influenced by the external environment, the "milieu interieur" of the body as well as by other genes, which are referred to as modifying genes. The pathogenic actions of genes need not always be manifested fully, the tendency for a gene to become manifest being referred to as its expressivity. Some genes have high expressivity, such as Huntingdon's chorea, whereas other genes will only produce observable effects with an appropriate outside stimulus or a special environment in the absence of which the manifest effects of the gene may be entirely suppressed.

Different modes of inheritance are found among mental disorders, some are transmitted by single dominant genes, others by single recessive genes and others by many genes (i.e. multifactorial or polygenic inheritance). A single recessive gene is clinically dormant, whereas a single dominant gene is clinically manifest. In dominantly transmitted disorders, only one parent need be affected, whereas in recessively transmitted disorders, both parents, who themselves may be free from the disease, contribute to the transmission of the disorder to their offspring.

It is a common error to assume that the discovery of genetic causation as a part factor in the development of psychiatric illness will paralyse therapeutic activity. This is far from being true and, in fact, its converse may apply. The discovery of the biochemical correlates of genetically determined disorders is in its early infancy but already the effective control of abnormal metabolism in certain forms of mental deficiency (such as that associated with phenylketonuria and galactosaemia) allows the child's development and growth to proceed normally. If future research reveals the precise nature of the underlying biochemical basis of genetically determined mental disorders, it would open up exciting new possibilities of more effective methods of treatment and prevention.

Methods used in Genetic research

The role of heredity in the causation of psychiatric disorders is not a matter of personal opinion or conviction but one of evidence as in any other science.

In the past the main method used for studying heredity was the investigation of isolated family pedigrees. This method, however, is only suitable for marked abnormalities transmitted by dominant genes with a high penetrance and is quite unsatisfactory for genetic studies of common disorders.

Two main methods are nowadays used for investigating the inheritance of common illnesses.

(1) The statistical - genealogical - proband method of WEINBERG *(1931).* This method consists in taking a random sample of patients suffering from the disease to be studied genetically (referred to as probands) and the incidence of the disorder ascertained in their relatives. This is then compared with the incidence of the disease in the relatives of normal probands of similar age and sex distribution. If the results show a statistically significantly higher incidence of the disease among the relatives of the disease probands than among the relatives of the normal probands, it is highly probable that the disease is due to inherited factors, in the absence of exogenous differences between the disease probands and control probands.

(2) Twin studies. Genetic twin studies are based on the fact that the genetic equipment of uniovular twins is the same so that any differences found between twin pairs are considered to be due to environmental influences. Binovular twins, on the other hand, have different genetic equipment so that any differences found between twin pairs may be due to heredity and/or the environment. The existence of a trait or disorder in both mem-

bers of twin pairs is called concordance. A high concordance rate indicates an hereditary factor

Let us now consider the results obtained by these methods of research in specific forms of mental illness.

Schizophrenia

Convincing evidence that Schizophrenia is inherited is provided by statistics indicating that the chance of developing the illness increases strictly in proportion to the degree of blood relationship to the schizophrenic proband. The morbidity risk for Schizophrenia in the general population is about 1 per cent. The morbidity risk for different categories of relatives of schizophrenics is as follows: first cousins 2 per cent, grandchildren 3-4 per cent, nephews and neices 3 per cent, parents 5-7 per cent, siblings 5-15 per cent, children 7-16 per cent, dizygotic twins 14 per cent and monozygotic twins 86.2 per cent.

STROMGREN (1938) and KALLMAN (1938, 1953) consider the inheritance of schizophrenia to be by a major recessive gene, the penetrance or expressivity of which varies, being affected both by modifying genes and environmental factors such as unfavourable family circumstances, emotional stresses, pregnancy, intercurrent disease and loss of weight. KALLMAN found, in monozygotic schizophrenic twins, that when one twin remained completely free of schizophrenic symtoms there were differences in physical health and body weight from early childhood consistently in favour of the normal twin. Concordant monozygotic twins of similar body build tended to have the same form of schizophrenia which developed practically at the same time and had a similar outcome, but when there were differences in body type, there were usually differences in the time of onset as well as the clinical picture.

Some authorities, however, favour a dominant mode of transmission with weak penetrance.

Although the evidence is conclusive that schizophrenia is genetically determined it cannot yet be regarded as established whether the mode of inheritance is dominant or recessive.

Affective Disorders

It will be necessary to consider separately, manic depressive psychosis, involutional melancholia and reactive depression.

There is considerable evidence to support the belief that both manic depressive psychosis and cyclothymic temperament are determined by the same gene. An excess of cyclothymic individuals are found in the families of manic depressives, the basic personality of the manic depressive is often markedly cyclothymic and both manic depressive patients and cyclothymic persons tend to have a broad or eurymorphic type of physique (REES, 1957). The theory put forward by SLATER (1936) that manic depressive psychosis is determined by a single dominant gene of weak and variable expression has gained most support. It has been shown that the risk of developing manic depressive psychosis increases proportionately with the degree of blood relationship to the manic depressive patient. The morbidity risk in the general population is about 0.4 per cent, in half siblings 16.7 per cent, full siblings 23 per cent, dizygotic twins 26.3 per cent and monozygotic twins 95.7 per cent.

Involutional melancholia is considered by SLATER (1953) and KALLMAN (1958) to be genetically distinct from manic depressive disorders and genetically more closely related to schizophrenia. With regard to reactive depressions and neurotic depressions there is no evidence that heredity plays an important role in their aetiology apart from indirectly determining type of personality makeup which may be conducive to development of this type of depression.

Organic states

The work of SJOGREN, SJOGREN and LINDGREN (1952) indicates that a single dominant factor was the most likely mode of transmission in Pick's disease whereas polygenic inheritance is probable in Alzheimer's disease. It was found that Pick's and Alzheimer's forms of presenile dementia were more common than usually realized and constituted about 10 per cent of all senile and presenile psychoses with a morbidity risk of 0.1 per cent in the general population.

The work of MJONES (1949) has clarified the heredity basis of paralysis agitans. His results indicate that the mode of inheritance is probably a single dominant gene with a manifestation rate of 60 per cent. Huntingdon's chorea is transmitted by a single dominant gene with such a high manifestation rate that practically every person possessing the gene will develop the disorder if he lives long enough. A person carrying the gene of Huntingdon's chorea will transmit it to

approximately half of his children in accordance with Mendelian laws.

Dominant genes arising from mutation which result in morbid conditions are usually doomed to extinction because the individuals bearing them are rendered infertile by the disease itself. This unfortunately does not apply to presenile dementia and Huntingdon's chorea because of the late age at onset which makes it probable that they will already have had children before developing the disease themselves.

Epilepsy

The results of twin studies provide strong evidence of the importance of heredity in the aetiology of epilepsy, e.g. CONRAD (1937) found that the concordance rate in uniovular twins was 67 per cent rising to 86 per cent if the idiopathic epilepsy only was considered. Further support of genetic factors in epilepsy is provided by electroencephalographic studies. LENNOX, GIBBS and GIBBS (1939, 1940, 1945) found that electroencephalographic abnormalities were very similar in epileptic uniovular twins.

Mental Deficinency (Oligophrenia)

It was shown by ROBERTS (1950) that oligophrenia, considered in terms of intelligence quotient, fell into two distinct categories, with a line of demarcation occurring at an I.Q. of 50. He found that, above this level, were the high grade (feeble minded) defectives who represent the lowest part of the normal frequency distribution of intelligence in the general population. In oligophrenia of this type the mode of inheritance was multifactorial (polygenic) as for intelligence generally in the population. Below an intelligence quotient of 50, ROBERTS (1950) found defectives who could not be accommodated into such a scheme and that in these the mode of inheritance was by means of single major genes. ROBERTS (1952) provided further evidence supporting this hypothesis, and he found that the correlation of intelligence between siblings of feeble minded defectives was +0.5, which is the value for the general population whereas in low grade defectives the correlation was practically zero. The siblings of low grade defectives are either low grade defectives which were in the minority or of relatively normal intelligence which applied to the majority.

Some clinical forms of oligophrenia are transmitted by single recessive genes and others by single dominant genes. The following are examples of those transmitted by single recessive genes: phenyl-pyruvic oligophrenia, late amaurotic idiocy, gargoylism and oligophrenia associated with galactosaemia. The following are examples of oligophrenia transmitted by dominant genes: tuberose sclerosis and oxycephaly.

The aetiology of mongolism has for many years been a controversial subject. The possible operation of genetic factors is indicated by the familiar occurrence of mongolism and the presence of signs which could be abortive forms of mongolism in otherwise unaffected close relatives of mongols. PENROSE (1951) suggested the possibility that the constitutional susceptibility of a foetus to mongolism could be due to a single very common gene the manifestation of which being largely controlled by factors due to maternal age which has been firmly established to be a very important factor in the aetiology of mongolism.

Using new cytological techniques it has recently been found that mongolism is associated with a small extra chromosome as shown by the work of LEJEUNE et al (1959) and FORD et al (1959).

Personality, Character and Neurosis

Animal breeding experiments have provided strong evidence of a genetic basis of behavioural characteristics in mice, rats, dogs and rabbits, particularly differences in aggressiveness, emotional stability and temperament (GINSBERG 1954, HALL 1951, FULLER 1953). A full review of the literature on the role of genetic factors in determining human personality traits is provided by DAVID and SNYDER (1951). EYSENCK (1956) investigated 52 pairs of identical twins by means of tests of intelligence, personality and autonomic nervous system functions. Three main factors were found, relating to intelligence, autonomic lability and to extraversion/introversion, all of which differed significantly between groups of uniovular twins compared with binovular twins the greatest difference being the factor of extraversion which EYSENCK (1956) considers to be determined by heredity to as large an extent as intelligence.

SHIELDS (1958) compared uniovular twins brought up apart with those brought up together and found that uniovular twins often showed significant similarity in important aspects of personality even when they had been brought up apart from an early age by

mothers of quite different character. This finding disproves the contention made by some that identical twins are only similar in personality because they are brought up in the same environment and exposed to the same parental attitudes.

Strong evidence of the inheritance of neurosis was provided by the work of BROWN (1942) who investigated the familial incidence of neurosis in the relatives of groups of probands suffering from anxiety states, hysteria and obsessional states and found it significantly higher than of relatives of a corresponding normal control group. EYSENCK and PRELL (1951) studied groups of uniovular twins, binovular twins and neurotic children of the same age by means of objective personality tests. Statistical analysis showed that about 80 per cent of individual differences in neuroticism was due to heredity and about 20 per cent to the environment. SHIELDS (1953) found that uniovular twins were twice as likely as binovular twins to have the similar degrees of difficulty in adjustment.

Thus all these studies indicate that genetic factors are important in determining in part. personality characteristics and the predisposition to neurotic illness.

General conclusions

During the past twenty years research into the inheritance of psychological attributes and specific mental disorders has steadily become more comprehensive and exact with important contributions arising from the use of mathematical-statistical methods for genealogical population and twin studies.

During the past decade, genetic-statistical population studies particularly in the Scandinavian countries, have yielded important data on the prevalence of mental diseases and mental deficiency in the normal population, and their morbidity risks. Studies of genetically determined metabolic disorders associated with mental deficiency, such as phenylketonuria and galactosaemia, have led to the development of methods of correcting these abnormalities with the striking result that development then proceeds normally. This is a pointer to future possibilities when the underlying biochemical basis of genetically determined psychoses are elucidated.

The results of genetic research should be co-ordinated with those derived from other research methods, such as biochemical, neurophysiological, neuropsychological, psychodynamic and social as stressed by SJOGREN (1957). Such multidisciplinary co-ordinated research would provide the best chance of discovering relevant data for the discovery of new and effective methods of treatment or prevention of psychiatric illness.

References

BROWN, F. *Proc. Roy. Soc.* Med., 35, 785, 1942.
CONRAD *Z. ges. Neurol. Psychiat.*, 159, 521, 1937.
DAVID, P. R. and SNYDER, L. H. *In "Social Psychology at the Cross Roads"*. New York, 1951.
EYSENCK, H. J. and PRELL, D. B. *J. Ment Sci.*, 97, 442, 1951.
EYSENCK, H. J. *Eugen. Rev.*, 48, 1, 1956.
FORD, C. E., JONES, K. W., MILLER, O. J., MITTWOCK, N., PENROSE, L. S., RIDLER, M. and SHAPIRO, A. *Lancet*, 1, 709, 1959.
FULLER, J. L. *Ann. N.Y. Acad. Sci.*, 56, 214, 1953.
GINSBURG, B. E. *Proc. Ass. Res. Nerv. Ment. Dis.* 33, 39, 1954.
HALL, G. S. *In Handbook of Experimental Psychology*. p. 304-329, New York, 1951.
KALLMAN, F. J., *Amer. J. Psychiat.*, 103-322, 1946.
Idem *Heredity in health and mental disorder*. New York, 1953.
Idem *The genetics of schizophrenia*. New York, 1938.
LENNOX, W. G., GIBBS, E. L., GIBBS, F.A. *Arch. Neurol. Psychiat.*, 44, 1155, 1940.
Idem *J. Hered.*, 36, 233, 1945.
Idem *J. Ment. Sci.*, 97, 738, 1951.
LENNOX, W. G. and JOLLY, D. H. *Proc. Ass. Res. Nerv. Ment. Dis.* 33, 325, 1954.
LEJEUNE, J., GAUTHIER, M. and TURPIN, R. *C.R. Acad. Sci.* (Paris), 248, 1002, 1959.
MJONES, H. *Paralysis Agitans. A Clinical and Genetic study. Acta. psychiat. Kbh. Supl.* 54, 1949.
REES, L. *Schizophrenia. Somatic Aspects*. Pergamon Press, London, 1057.
PENROSE, L. S. *J. Ment. Sci.*, 97, 738, 1951.
ROBERTS, J. A. F. *Congres international de Psychiatrie*. Rapports 6, 55-117, 1950.
SHIELDS, J. *Eugen. Rev.* 45, 213-246, 1954.
Idem *Eugen. Rev.* 50, 115, 1958.
SJOGREN, T., SJOGREN, H. and LINDGREN, A. G. H. *Morbus Alzheimer and Morbus Pick Acta. Psychiat. Kbh. Sup.* 8, 1-152, 1952.
SJOGREN, T. *11th Int. Congress for Psychiatry. Congress Report* 2/312, Zurich, 1959.
SLATER, E.T.O. *Proc. Roy. Soc. Med.*, 29, 981, 1936.
Idem *1st Cong. Int. Psychiat., Rep.* 6, 120-151, 1950.
Idem *Psychotic and neurotic illness in twins*. London, 1953.
Idem *Genetical causes of schizophrenic symptoms. Mschr. Psychiat. Neurol.*, 113, 1943.
STENSTEDT, A. *Acta. psychiat. Kbh.* suppl. 79, 111, 1952.
STROMGREN, E. *Beitrage zur psychiatrische Erblehre. Acta, psychiat, et Neurol.* Supp. 19. 1938.
WEINBERG, W. *Arch. f. Rassen-u-Gesellsch. Biol.*, 23, 281, 1931.

Hospital Call Systems

A SURVEY

Work study (the subject of the Editorial in this issue) is not confined to the investigation of movement, but also involves the replacement of outdated apparatus or systems of communication. The introduction of elaborate systems for staff location in many hospitals is an indication of the awareness of this need.

The present trend for hospitals to be centralised, and therefore larger, and including more departments, makes it increasingly difficult for staff to be located. From a hospital without any means of communication to supplement its telephone system, one is in a very good position to review the systems used elsewhere. It is still just debatable whether any supplementary system is desirable at all in a compactly designed hospital such as our own, where the greatest distance is from the wards to the Pathology Lab. The house staff are still unmolested by bleeps, or worse,a voice speaking from his pocket, and can always refuse to answer the telephone if it is inconvenient. They are not yet caught up by the buzz of 20th century efficiency which could be seriously detrimental to the medicine they are supposed to practise.

The other impression which one receives from reviewing the various systems is that with increased accessibility, the number of unnecessary calls must rise considerably, in much the same way as the usage of syringes increases as they become more abundantly available. The nuisance value in this respect must be considerable, and quite unavoidable.

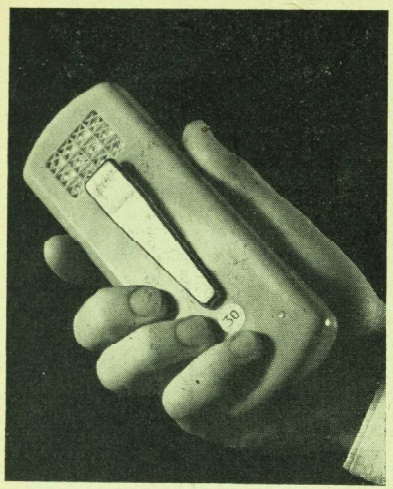
From the other point of view countless hours of frustrated telephoning and searching are spared to the caller, and for this reason these modern systems are becoming inevitable. Even at Bart's, where there is no sign of adoption of any of these systems, the extension of the Hospital to the other side of Little Britain must sooner or later demand the introduction of one or other of the systems now available. It is interesting to observe that Bart's once had a call system, the relic of which is to be seen in every ward, and which is still used to call the night sisters. It limited its call to the duty officers of the day, but it seems that it was abandoned after only a few years' use. After all, the chances are that if the duty house officers are in a ward at all, they will be in their own ward, which makes such a system of very limited value.

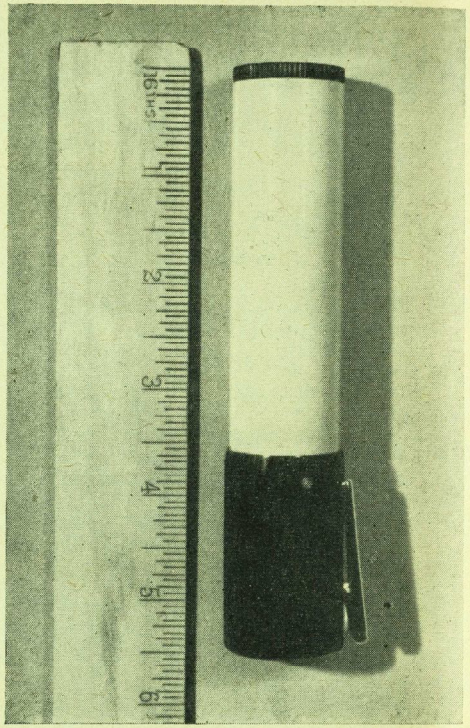
The survey already described (Editorial) on the subject of Work Study was extended to the subject of Call Systems: the results were most interesting, and in general showed a trend towards the adoption of the new magnetic system recently developed by St. Thomas' Hospital in conjunction with Messrs. Multitone. Statistics from questioning only 12 hospitals can hardly be considered of great significance, but certainly they are of interest. It was found that four were using a loudspeaker system which is generally regarded as unsatisfactory; while it has the advantage of being universally audible, this is outweighed by considerable nuisance value to both staff and patients, although Cambridge report that when it was introduced at Addenbrooke's the patients even enjoyed the distraction it afforded. All four hospitals are changing to the Multitone system.

Another four used a flashing light system, usually involving four coloured lights. Opinions about the efficacy of this method of calling vary: The Royal Berkshire Hospital, Reading, consider it completely satisfactory; Guy's found it reasonably effective, but two others were dissatisfied. The chief objection is that siting at strategic points which will not at the same time be a nuisance is extremely difficult. Two of these hospitals are changing to the Multitone system.

The remaining four hospitals were St. Thomas', who formerly used a system of bells which rang out a code for each person to be called; the Radcliffe Infirmary at Oxford had a similar system, but operated on buzzers and believed to be unique; Edinburgh, who like ourselves, have no system to supplement telephones are also hoping to follow the example of St. Thomas' in adopting the Mulitone system ; and the Westminster who originally used only telephones (which they found grossly unsatisfactory) have already done so.

In all ten of the twelve hospitals questioned have changed or are hoping to change to the Multitone system. This hardly requires any introduction. Those to be called





Above: the Radiopage receiver used at the London Hospital transmits the spoken message. (Photograph by kind permission of the British Communications Corporation Ltd.).
Right: the Multitone receivers (first used by St. Thomas' Hospital) operates on 50 frequencies. (Photograph by kind permission of "The Hospital").

hear the "bleep" on the pocket receiver shown in the photograph. These operate on 50 frequencies, and if more than this number of people are to be called, simple codes can be arranged.

They weigh only 6 oz. and can be dropped from 6 feet on to concrete without being damaged. They were inaugurated at St. Thomas' on 28th June, 1956. The system obviates all the disadvantages of the older systems such as noise, and difficulties of siting or coding complications. It has been adopted by almost 50 hospitals, as well as by businesses, industries and large hotels.

Another form of the same system carries the spoken message: the receiver shown here is used at the London Hospital. It is said to have the disadvantage that the message cannot be acknowledged, but in practice this seems to be a minor ailment of the system. Some systems (though not that at the London) avoid awkward moments, the message is only given if the set is switched on by its owner—who may, if he prefers, take the message later by telephone. The system has wide scope. For example, at the Maida Vale Hospital for Nervous Diseases, the night porter is no longer bound to the door or switchboard, for the bells of both operate the receiver which he carries with him. At another hospital, receivers are hung on a rack when the owner is out: this switches on a light at the transmitter, and therefore serves as a most efficient IN-OUT indicator.

It is interesting to quote a few figures. At a London teaching hospital, the average delay per call has been reduced from 2.36 minutes to 54 seconds and the number of frustrated calls has been reduced from 23 per cent to only 5 per cent.

At St. Thomas' it is common practice for the doctor called to ring back within 15 seconds; formerly, delays of 15 minutes were common. The system is in fact, an outstanding success.

References

Work Study

Work Study in Hospitals: The Leytonstone Investigation, by C. Harcourt Kitchin, *The Hospital*, August 1958.

Work Study in a Central Syringe Department, by R. P. MacMahon, *The Hospital*, October 1958.

Call Systems

St. Thomas' Hospital: Magnetic Calling System for Medical Staff, by W. A. A. Pearson, *The Hospital*, October 1956.

Magnetic Calling System, Experience and Developments, by W. A. A. Pearson, *The Hospital*, March, 1958.

Work Study and Staff Location in Hospitals, by N. J. S. Clemens and J. N. A. Lemlian, *The Hospital*, February 1959.

Acknowledgments

The Editor would like to thank in particular Mr. R. P. MacMahon, Deputy House Governor at the Westminster Hospital, and also the Secretaries of the following hospitals or hospital groups for their help in supplying the information which made this survey and article possible: St. Thomas's Hospital, The London Hospital, Guy's Hospital, The Middlesex Hospital, Reading and District Hospital Management Committee, the United Cambridge Hospitals, the United Bristol Hospitals, the United Oxford Hospitals, the United Birmingham Hospitals, Manchester Royal Infirmary, and the Royal Infirmary of Edinburgh.

EDITOR

Letters to the Editor

CUTS BY THE SCORE

A Job Methods Man reports on a visit to the Royal Festival Hall.

Sir,

For considerable periods the four oboe players had nothing to do. The numbers should be reduced, and the work spread more evenly over the whole of the concert, thus eliminating peaks of activity.

All the twelve first violins were playing identical notes. This seems unnecessary duplication. The staff of this section should be drastically cut; if a large volume of sound is required, it could be obtained by means of electronic amplifier apparatus.

Much effort was absorbed in the playing of demi-semi-quavers. This seems an excessive refinement. It is recommended that all notes should be rounded up to the nearest semi-quaver. If this were done, it would be possible to use trainee and lower grade operatives more extensively.

There seems to be too much repetition of some musical passages. Scores should be drastically pruned. No useful purpose is served by repeating on the horns a passage which has already been handled by the strings. It is estimated that if all redundant passages were eliminated, the whole concert time of two hours could be reduced to twenty minutes, and there would be no need for an interval.

The Conductor agrees generally with these recommendations, but expresses the opinion that there might be some falling-off in box office receipts. In that unlikely event, it should be possible to close sections of the auditorium entirely, with a consequential saving of overhead expenses—lighting, attendants, and so on.

If the worst came to the worst, the whole thing could be abandoned, and the public could go to the Albert Hall instead.

S. Tone-Deaf

A UNIQUE OCCASION

Dear Sir,

It was good to see your illustration of the first inspection of the R.A.M.C. by a President of the Royal College of Surgeons. It recalled a memory of 1916 when, at Bart's, we had a medical detachment of the University of London O.T.C. Our training took place in the General Post Office yard and at a summer camp at Codford St. Mary. One had to be on the alert when "forming fours" under the eagle eye of Sergeant J. Ross.

12 Barnfield Hill,
Exeter.
13th November, 1959.

Yours faithfully,
NORMAN CAPENER.

THE APHORISMS OF COZENS BAILEY

Sir,

A month or two ago I was reminding G. Bourne of some of the aphorisms with which Mr. Cozens Bailey used to embellish his surgical teaching, and he suggested that I should offer them to you for the Journal.

I was Bailey's H.S.—somewhere about 1912—and collected and stored up these "sayings". Each was usually prefaced by "What I always say is . . ."

I enclose them with this letter.

Yours sincerely,
A. B. PAVEY-SMITH.

"What I always say is . . . "

Carcinoma of the breast has no symptoms.

Tubercle will appear wherever there are blood vessels—and in some places where there aren't.

All is not fluid that fluctuates.

Every breast operation takes years off your life.

Once a stricture always a stricture—and when you think it's cured you must always remember that it isn't.

If the "facts" don't fit the case so much the worse for the "facts".

If you don't like comparing surgical things to articles of diet then you'd better give up Surgery.

If you suspect a man of having syphilis don't *listen* to his tongue—*look* at it.

SPORTS CLUB TOURS

To the Editor,
St. Bartholomew's Hospital Journal.

Sir,—We understand from usually reliable sources that the rugger club spent something in the region of £130 on their recent tour in the West-country. During the course of their five night tour the club played three matches, lost three matches and gained only six points.

Discussion of this matter with a member of the team elicited the information that the team put up with a 10s. 6d. bed and breakfast, drank less than usual and behaved more quietly than usual in order to try and leave a more favourable impression in their wake than they have managed to do in recent years. All this we think is very laudable. We were also told that the team contributed £4 each to the expenses—why then did it cost the Students' Union £130 (which incidently we, collectively, provided)? One reason must be the high cost of transporting twenty-two men to the West-country.

Why do the team go to the Westcountry? Some say it is tradition, others say it is because all the other hospitals send teams there—neither reason is good enough. Others say it is to take the good name of Bart's into these remoter parts. We doubt if the Rugger Club are our best ambassadors and in any case we suggest they stay nearer at home and try to consolidate the work done for the hospitals good name by the successful tours of the Cricket and Soccer Clubs. These two clubs went to Sussex and Cambridge at a cost to the Students' Union of £50 and £24 respectively.

We remain Sir,
Yours faithfully,
THE SPHEROIDS.

The Abernethian Room,
St. Bartholomew's Hospital.

Book Reviews

THE COMPARATIVE ANATOMY AND PHYSIOLOGY OF THE NOSE AND PARANASAL SINUSES

by Sir Victor Negus
pp. 402. figs. 178. Published by E. and S. Livingstone. Price 70s.

This book, which embodies the patient and careful research over the last twenty years, brings together the original work of the author upon nasal anatomy, morphology and physiology of the upper respiratory tract. Although it is primarily concerned with the nose and the accessory sinuses, it recapitulates much previously published work on the larynx.

Finely produced and lavishly illustrated, it is a tribute to the immense breadth and depth of the author's knowledge and interest in what has seemed to others an unrewarding field. He illustrates his thesis from the whole range of the animal kingdom and leaves us with a higher regard for this humble organ that carries out its many and complicated functions with such ingenuity that few of us, fortunately perhaps, are aware of them. Here too is the basis of treatment by restoring the anatomy and function to normal.

The book commences with an essay on the adaptations of the nose for olfaction; the mechanisms of air conditioning and fluid exchange are clearly analysed. There are particularly good sections upon ciliary activity and the organ of Jacobsen. On the debit side the anatomy and morphology of the soft palate and naso-pharyngeal sphincter, and the electrophsyiology and neurology of the smell brain have been considered to lie outside the scope of the book.

Sir Victor Negus anticipates some criticisms of his interpretation of observed facts when he quotes Professor Le Gros Clark, who remarked 'it is a mistake to wait for absolute proof for fear of beng accused later of inaccuracy, with denigration'. It is certain that many will challenge him on both fact and conclusion, but none will deny his authority as doyen in this field.

DOCTORS COMMONS

by Paul Vaughan
William Heinemann - p. xvi and 254 - Price 18s.

It is doubtful if even the far-sighted Dr. Charles Hastings anticipated in 1832 how his Provincial Medical and Surgical Association, founded to oppose the powerful conservative interests of Medicine in London, would develop into the B.M.A. as we know it today, with 71,000 members drawn from every section of the British Medical profession.

There are too many misapprehensions in the public mind as to the nature of the B.M.A. It is not, as the author specifically points out, a Trade Union and any such idea is precluded by its own Constitution. Nor is it the place where doctors take the Hippocratic oath or a body constituted to discipline the profession.

But if the public is ignorant so too are the majority of those who are in or who hope to enter the profession. How many of us are familiar, even en passant, with the details of the Association's fight for Medical Reform which culminated in the Act of 1858, or with the struggles to reform the Poor Law Medical Service and the Army Medical Service.

The details of the ineptitudes of both government and military authorities, with regard to the care of the sick and wounded, even in the light of the Crimean campaign, appal the reader. It was not until the Franco-Prussian War that we were shown how such matters should be handled, and the R.A.M.C. was founded only sixteen years before the First World War. Imagine the Western Front had we not seen the light in time.

These matters together with the development of the B.M.J., the "Lloyd George", the inception of the N.H.S. and many other topics are dealt with by Mr. Vaughan in a light and easy style. This is a "short history" and all irrelevant detail is discarded leaving us with a clear general picture in which are set cameos of the personalities who did so much to shape the successful development of the B.M.A. into what has been described as "one of the most highly developed and efficient of all British professional organisations". This is a book that all should read.

A.J.B.M.

DR. JENNER OF BERKELEY

By Dorothy Fisk
Heinemann 1959 - 288pp. - 25s.

Few publishers will undertake the risk of issuing serious biographies of medical men, and it has become necessary to dress up for popular consumption this type of literature in order to secure its financial success. No harm is done if the facts are authentic; on the contrary, the general public can benefit from an appreciation of the trials, tribulations and triumphs of eminent men.

Edward Jenner (1749-1823) has been the subject of several biographical studies, the most outstanding recent contribution being Mr. W. R. LeFanu's Bio-bibliography of Edward Jenner published in 1951. Quoted by Dorothy Fisk as the most important of her sources, it might well have served as an example of a well-documented piece of research. Her own list of sources contains only two dated items, and the index not only flaunts most rules of indexing, but is not even alphabetical!

The story of the development of methods used to combat smallpox is intricate, and the literature on the subject is enormous. Following closely upon the publication of Jenner's Inquiry, for example, there was a spate of books and pamphlets by both supporters and opponents of vaccination, and we still have literature published devoted to the pros and cons of the subject. It is impossible for anyone, a layman in particular, to assess the value of many of these early writings because their authors quite frequently did not themselves fully appreciate Jenner's methods. Some of his keenest supporters were in fact hindrances rather than helps in furthering his object. Laymen will still fail to appreciate the difference between inoculation and vaccination; they will also find neither of these terms in the index to this book.

The background material for Dorothy Fisk's' biography has obviously been collected as the result of much labour, but it tends at times to obscure the figure of Jenner. There are so many other characters mentioned, so many events recorded that it is difficult to obtain a clear picture of the person named in the title. We obtain glimpses of the typical country practitioner, lover of the countryside, keen naturalist and observer who spent large sums of money on publicising vaccination. It was in an attempt to recoup his losses that he was persuaded to come to London, but he must have been as out of place there as a lamb among hungry wolves. His early return to Berkeley where everybody was an undisguised friend was necessary for his survival.

The general public with a leaning towards this type of literature will read this book with pleasure and profit. It lacks the sensationalism of certain similar writings, but will interest the careful plodder who expects nothing sufficiently well documented as to permit the term scholarly.

JOHN L. THORNTON.

Extracorporeal Circulation

by R. L. HURT
(*Research Assistant*)

A report of the experimental use of a Gaertner-Kay artificial heart-lung machine at St. Bartholomew's Hospital

For many years it has been recognised that the successful treatment of many forms of congenital and acquired heart disease would require some method of operating on the open heart under direct vision in a dry field. In the United Kingdom each year there are born approximately 3,000 infants with congenital heart disease. Excluding cases of patent ductus arteriosus and coarctation of the aorta, about half of those infants who survive the first year of life have defects that are amenable to corrective surgery. Some of these operations can be performed by a "closed" technique but the majority are better done by an "open" operation which is made possible by using a machine to take over the function of the heart and lungs. As further experience in the use of these machines is gained it is certain that they will also be used increasingly for cases of acquired heart disease, such as aortic stenosis, mitral stenosis with calcification, or mitral regurgitation.

The use of hypothermia, in which the patient is cooled to 30 deg.C, allows the circulation to be interrupted for about 9 minutes. This provides sufficient time for certain abnormalities such as the secundum type of atrial septal defect or pulmonary stenosis to be corrected. Other abnormalities such as ventricular septal defect, tetralogy of Fallot, or the primum type of atrial septal defect, are more complicated and require a longer time for operation. It is for such cases as these that some form of artificial heart-lung machine is essential. The machine maintains the systemic blood flow (including in particular the cerebral circulation), and allows the operation to be performed carefully and without haste. In addition there is no fixed time limit within which the operation must be performed and this is of great psychological importance to the surgeon, who may always encounter an unexpected abnormality within the heart, or an unexpected difficulty in the surgical procedure.

The use of a heart-lung machine does not allow an unlimited time for operation, since all types of machine damage the blood to some extent, depending on the principle upon which they work. The majority of pumps and some methods of oxygenation traumatise the blood by fragmenting the red cells, removing fibrinogen and platelets, and liberating haemolysins. This leads to difficulties in blood coagulation at the conclusion of the operation. In the early days of heart-lung machines many of the experimental animals died of haemorrhage because this problem was not fully understood and adequate precautions were not taken to minimise blood damage.

Recently Drew at the Westminster Hospital has been developing a new technique of profound hypothermia in which the patient's temperature is reduced to 15 deg. C, two pumps being used to support the heart during the cooling process. At this temperature operations on the open heart lasting as long as one hour have been successfully performed but the method is new and its full value has yet to be assessed.

Much of the pioneer work on pump-oxygenators has been done in the United States. To Gibbon, who published his first paper on this subject in 1939, must go the credit for using a heart-lung machine for the first time in man. In 1953 he successfully repaired an atrial septal defect, using a machine that has since been modified and used with great success by Kirklin at the Mayo Clinic on several hundred patients. In the same year Andreason, working in England at the Royal College of Surgeons, showed that dogs would survive complete occlusion of both venae cavae for 30 minutes, providing blood was allowed to return to the heart via the azygos vein. The circulation was therefore maintained entirely on this so-called azygos flow, which is about 10 per cent of the normal cardiac output. As life could be maintained on such a small flow, cross circulation experiments were performed, using a second dog as a "heart-lung machine". This work was repeated by Lillehei at Minneapolis and ventricular septal defects were successfully repaired in children using an adult human donor for cross circulation. However, this technique involved too great a risk for the donor and was abandoned. It was replaced

by a low-output heart-lung machine, thus still using the low-flow principle. Experience showed that these low-flows had grave disadvantages and consequently great efforts were made to design a machine that would provide an output equal to the normal systemic flow at rest. In England, Melrose spent several years developing a machine of this type and it is now used routinely on patients at the Hammersmith Hospital, London and at Stanford University Hospital, San Francisco. There is no doubt that the Melrose machine in its latest form is most satisfactory.

Types of heart-lung machine

Certain basic principles govern all types of heart-lung machine. The venous return to the heart is diverted through large cannulae introduced into the superior and inferior venae cavae via the right atrium. This blood passes to the machine by gravity through a large bore tube into a reservoir situated about 12 inches below the patient. The blood after passing through an oxygenator is pumped back into the patient through a cannula tied into the femoral artery, the cannula being directed centrally so that the blood runs into the aorta and thence to the rest of the body. There is a fine mesh filter in the arterial line, so as to prevent fibrin emboli entering the circulation. All types of machine permit control of the output of arterial blood and also the volume of blood in the machine. Some form of heating device is usually incorporated so as to maintain the blood and body temperature. It is highly desirable that all parts of the machine that are in contact with the blood may be easily sterilised and cleaned.

One of the main problems in heart-lung machines has been to develop an adequate lung mechanism. It is necessary to add oxygen and remove carbon dioxide from a large volume of blood—up to 4 or more litres a minute when operating on an adult. The blood must be exposed to the gas atmosphere as a very thin film — no more than half a millimetre thick and preferably less. This means that the artificial lung must spread the blood over an area of 2-10 square metres, expose this film to an atmosphere of oxygen under sterile conditions, and collect the oxy-

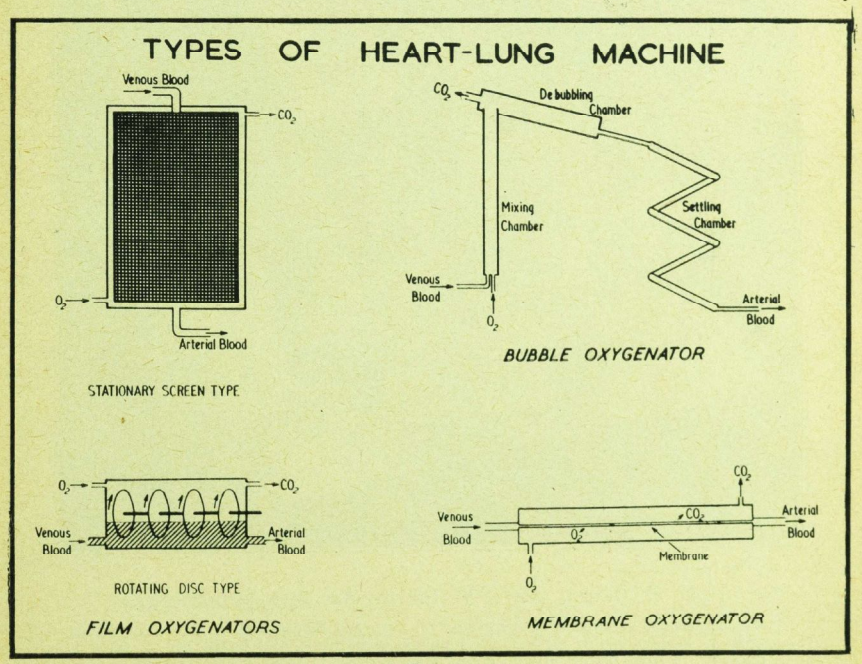


Fig. 1.

genated blood ready for pumping back into the patient.

Special precautions must be taken to reduce to a minimum the damage to the blood during its extracorporeal circulation. Plastic tubing is used throughout as this causes minimal adherence of platelets to its internal surface and hence minimal loss of coagulability of the blood. The stainless steel connecting pieces are tapered so as to avoid eddies in the flow of blood, and all the surfaces are highly polished and kept as scratch free as possible. It is especially important to use a pump that does not injure the blood; for this reason a roller type of pump which gently compresses the tubing containing the blood is often employed.

There are three types of artificial heart-lung machines that are at present in use (Fig. 1):

(1) Bubble oxygenator;
(2) Film oxygenator;
(3) Membrane oxygenator.

Bubble oxygenator: In this machine which has been developed by the Lillehei-DeWall group at Minneapolis, blood and oxygen enter the bottom of a long vertical tube. The blood is converted into foam, which then passes into a defoaming chamber where it is converted into a nearly bubble-free state by contact with a substance that lowers its surface tension. This blood then passes into a coiled settling tube in the form of a helix where any remaining bubbles are able to separate. The oxygenation in this machine is very good, but the output of oxygenated blood is relatively small and is limited by the time interval necessary for the blood to be made completely bubble-free. This machine was designed on the "low flow" principle but

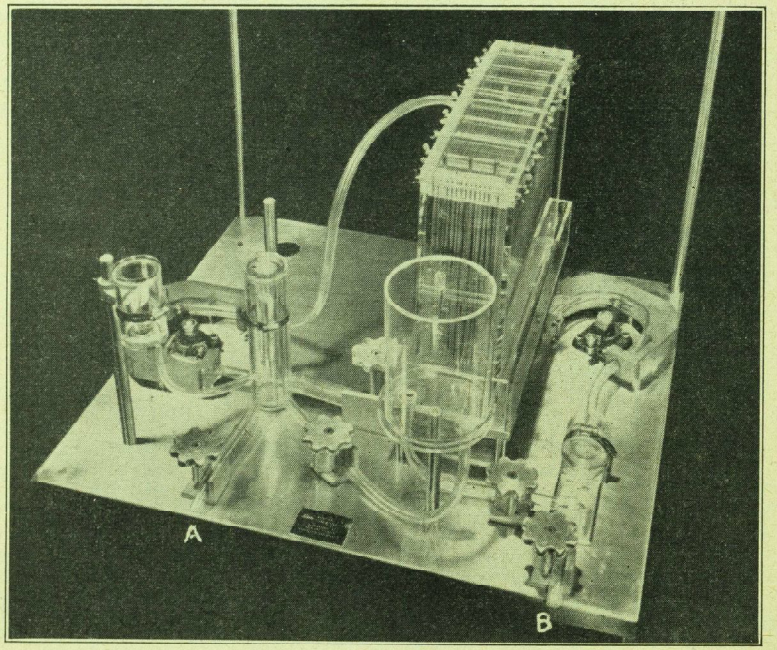


Fig. 2. *General view of the Gaertner-Kay heart–lung machine*

On the left can be seen the recirculating pump and on the right the arterial pump. In the centre is the perspex oxygenator case containing the vertical stainless steel screens, and to the left of the oxygenator is the venous reservoir. In front of the arterial pump is a filter. Blood from the venae cavae enters at A and arterial blood leaves the machine at B.

recent models are able to provide a flow of about 3 litres a minute, though this is still below the normal resting circulatory level for an adult. The machine, apart from the pumps, is made entirely of plastic tubing. Since fresh tubing is used for each operation, it is not necessary to clean the machine after use, whereas oxygenators of a non-disposable type require meticulous cleansing, a most-time-consuming procedure. The machine is relatively cheap, costing about £700. The priming volume is reasonable, 2-4 pints being required depending on the rate of flow. However, it is being superseded by other machines that can produce a higher and more physiological flow of oxygenated blood.

Film oxygenator: The blood is spread out as a very thin film in an atmosphere of oxygen, thus allowing the oxygen and carbon dioxide exchange to occur. There are two types of film oxygenator—the stationary screen oxygenator and the rotating disc oxygenator. In the stationary screen oxygenator, of which the machine used at the Mayo Clinic is an example, the blood runs down a series of stainless steel gauze screens, each of which is 18 inches long and 12 inches wide. These screens are enclosed in a perspex case, through which a mixture of 97½ per cent oxygen and 2½ per cent carbon dioxide is passed. The oxygenated blood is pumped out of the base of the container by an arterial pump. In the disc oxygenator the blood is picked up as a thin film on a series of rotating stainless steel discs. This type of apparatus was first developed by Björk in Sweden. The same principle has been used by Melrose in the highly successful machine now being used clinically at the Hammersmith Hospital.

Membrane oxygenator: In this oxygenator, which attempts to imitate the lung more closely than does any other machine, the blood is separated from the oxygen by an exceedingly thin plastic membrane, through which the oxygen and carbon dioxide diffuse. Clowes, working in Cleveland, has developed this type of oxygenator but it has proved difficult to make it reasonably compact and easy to sterilise. Thomas in Paris has also developed an apparatus working on this principle and has used it successfully on many human patients.

Gaertner-Kay machine

A simplified version of the stationary screen oxygenator that is in clinical use at the Mayo Clinic has been used experimentally on dogs at St. Bartholomew's Hospital. The Mayo Clinic machine is a complicated piece of apparatus costing about £15,000; much of its expense is due to its numerous electronic monitoring and safety devices. The simpler machine (Fig. 2) was designed by Dr. Gaertner and Dr. Kay working at the National Heart Institute in Bethesda, America. It is made of perspex and has 5 or more stainless steel mesh screens, each 10 inches long and 16 inches wide. There are two rotary (DeBakey) pumps; one to pump blood to the top of the oxygenator and the other to pump the blood back into the patient. The tubing is made of polyvinyl chloride, a plastic that is less harmful to the blood than is rubber. There are no electronic safety devices. About 5 pints of blood are required to prime the machine. The circulation of blood through the machine is shown in Fig. 3. The venous blood enters a reservoir and is then pumped to the top of the oxygenator. It is oxygenated as it runs down the stainless steel screens and is then returned to the venous reservoir. There is thus a continuous circuit of blood round the oxygenator. Into this circuit runs venous blood from the animal, and oxygenated blood is pumped from the base of the oxygenator back into the femoral artery and so to the rest of the body.

Fig. 4 shows how the machine is connected up to the experimental animal. Through a right thoracotomy, the heart is exposed and two catheters are introduced into the heart via the right atrial appendage, one into the superior vena cava and one into the inferior vena cava. At the time of bypass, slings placed around the cavae and the contained catheters are drawn up so that all the blood returning to the heart, except the coronary return, flows through these catheters and then by gravity into the venous side of the machine. The blood is oxygenated as it passes down the stainless steel screens and is then pumped back into the dog through the femoral artery. The dog is heparinised before the catheters are inserted; at the conclusion of the bypass, the heparin is neutralised with an appropriate dose of protamine.

During the whole operation, including the actual bypass, a continuous record is taken of the arterial pressure, venous pressure, electrocardiogram, and electroencephalogram. The temperature is also recorded as it will fall considerably during the bypass if the blood in the machine is not warmed.

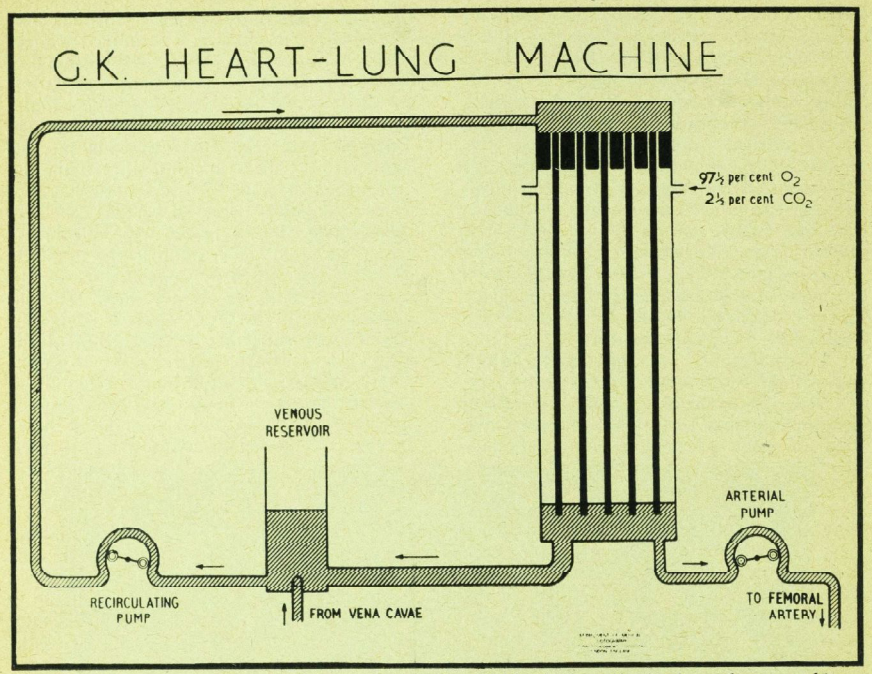


Fig. 3. *Schematic diagram showing circulation of blood through the heart-lung machine*

As soon as the heart-lung bypass is running smoothly, the heart is stopped with potassium, using the method developed by Melrose (Fig. 4). The ascending aorta is clamped distal to the origin of the coronary arteries and 2.5 per cent potassium citrate is injected into the root of the aorta. The potassium solution enters the coronary arteries and the heart stops in diastole. The motionless heart may then be opened, and since there is no coronary flow, the heart is absolutely dry. The heart is started again by releasing the aortic clamp and allowing the potassium to be washed out of the myocardium by the blood pumped up the aorta from the machine. Care has to be taken at this stage that the heart does not become distended, as the coronary flow is enormously increased due to the effect of the potassium on the capillary bed. A sucker placed inside the right ventricle before it has been finally closed is used to aspirate blood from the right side of the heart and prevent any distension occurring. This blood is automatically returned to the machine. It may also be necessary to release one of the caval slings and allow some of the large coronary flow to return through the cava to the artificial circulation. Ventricular fibrillation will occur in about 20 per cent of cases, but the heart may be easily defibrillated electrically and a normal heart-beat then follows.

Results of experimental work

Before a heart-lung machine can be used successfully on human beings, a period of laboratory work is necessary so that the machine can be made to work properly, so that the technique of perfusion and of going on and coming off bypass, may be worked out, and so that the personnel involved in such an operation, the surgeon, anaesthetist, physiologist and pump operator, may become used to working together as a team. The experimental animal work began early in 1958 and the "G.K." machine has been used to bypass a dog's heart in 80 operations. For the first few months the dogs died with monotonous regularity and there was considerable trouble with foaming of blood in the machine, and later, when this foaming had been eliminated, with poor oxygenation. The arterial oxygen saturation fell to 80 per cent or less even at relatively low flows within 15 minutes of the commencement of the bypass. By making major modifications in the oxygenator, the foaming of blood was eliminated and the oxygenation was improved. In the summer of 1958 a few dogs began to survive, and then during October six consecutive dogs survived successfully a bypass of thirty or more minutes and made complete recoveries.

Unfortunately it has proved impossible to make this machine work sufficiently well for human use and this has been the experience at many other centres where this type of apparatus has been used. By using 9 screens it was possible to obtain an output of 1,600 ccs. per minute, this being just sufficient for a dog weighing 16 Kg. The oxygen saturation of this blood was only about 80-85 per cent however, and if any higher flow rate was used, the oxygenation fell precipitously. The priming volume for the machine containing 9 screens was 5 pints. The efficiency of the machine could have been improved by rebuilding the oxygenator, and increasing the number of screens, but this would of necessity have meant increasing the priming volume of the machine, which was already large. It was therefore decided that we were not justified in using the machine for human cases. In its place a Melrose type of heart-lung machine has been purchased and this has been used in the animal laboratory during the last few months with complete success. The machine is now in clinical use at Hill End Hospital, St. Albans.

Results of open-heart surgery

There is no doubt that open-heart surgery is now a safe procedure with the use of a heart-lung machine. It has provided the means whereby many forms of congenital and acquired heart disease may be treated satisfactorily. The work of Kirklin, Lillehei and Cooley in America and Cleland in this country, shows that the results of the closure of ventricular septal defect in the absence of severe pulmonary hypertension are very good. Operation for cases of tetralogy of Fallot is less satisfactory and the mortality is higher. On the other hand, operation for aortic stenosis, both congenital and acquired, is now best performed under direct vision with the use of a heart-lung machine. It is certain that the scope of open heart surgery will increase rapidly during the next few years.

Conclusion

The successful management of extracorporeal circulation demands skilled team work, much complex recording equipment, and great attention to a host of details. The establishment of a heart-lung team is a considerable undertaking and requires a prolonged period of laboratory work. The animal surgery has been carried out by Mr. O. S. Tubbs, Mr. I. M. Hill, Mr. P. R. Slade and Mr. E. Shocket. Dr. B. G. Wells has been responsible for the electromanometry and other recording apparatus and has given a great deal of help in other ways. Dr. Mendel has been invaluable with physiological and technical advice and Doctors Keil, Langdon and Young have given up a great deal of their time to provide anaesthesia. Dr. Story has done all of the numerous haematological

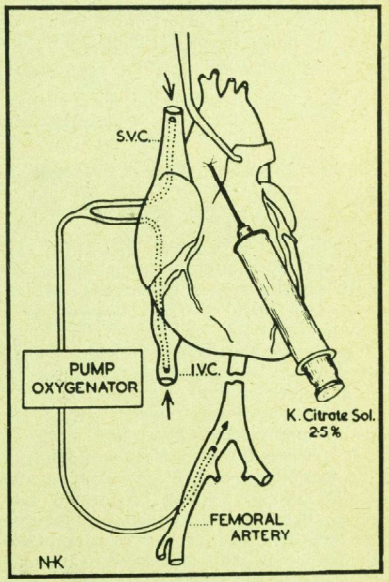


Fig. 4. *Method of potassium arrest*

Potassium citrate is injected proximal to a clamp placed across the aortic arch. The potassium enters the coronary circulation and the heart stops. This diagram also shows the method of connecting the heart-lung machine to the experimental animal

studies and the thoracic unit theatre sister, Miss Mason, has come up to London from St. Albans for almost every animal operation and has been quite indispensable. The physics workshop, under Mr. Crichton, has been most patient with the repeated requests for technical work.

My thanks are due to Mr. O. S. Tubbs for his helpful criticism of this article; and to Mr. N. K. Harrison for the illustrations.

HISTORICAL DIAGNOSIS

Lucan, in Book IX of his poem Pharsalia, otherwise entitled The Dramatic Episodes of the Civil War, describes the peculiar manner of the death of two of Cato's legionaries during their march through Libya in February of 46 B.C.

Of one, ' . . . The bite was not painful and the wound seemed harmless enough but the hidden venom began to boil, and a devouring flame spread through the marrow of his bones, drying up the moisture which surrounded his vital organs, and the saliva that kept his tongue wet, and the sweat in his pores, and the very tears in his eyes.'

The account goes on to describe how the patient felt as though he was on fire, and 'rushed about madly in the quest of the water for which his heart craved'.

Of the other, ' . . . The skin next to the bite began to break down, and the flesh to melt away until the white thigh-bone showed ; then, as the wound widened farther, the body swam in corruption and slowly disappeared, starting with the calves, knees, and thighs. Black matter dripped from the thighs, the muscles that held the belly in place snapped and the guts slid out. S., in fact, slowly trickled into the ground, and there was unexpectedly little left of him, for he was a big man.

'His anatomy was for a while revealed with painful clearness: ligaments, sinews, the structure of the lungs, the bones of the chest, and all the inner organs.' A.M.W.

SUGGESTIONS PLEASE!

Sports News

VIEWPOINT

Recently, in the National Press, there has been more than a little discussion about the relative positions of amateurs and professionals in the world of sport. Perhaps one of the more interesting points has been concerning the Rugby Football Union. Unlike its professional counterpart in the North, its clubs are entirely free to play whom they like, and the results of any matches played are relatively unimportant. There have been recent suggestions that Union clubs should run on the same lines as the Rugby League, and that they should actually be formed into Leagues. The reaction to such a suggestion is on the whole one of horror, particularly from the Union clubs themselves, and one can but agree with their sentiments. There are, of course, points for and against such a scheme. No doubt one or two people may be persuaded to visit Chislehurst occasionally, particularly if the Hospital Rugger Team was fighting for promotion to Division I, for instance. But once such a spirit enters amateur sport, particularly Rugby, then the whole point of the game which, to use the often coined remark that it is the enjoyment of a game rather than the result that matters, is lost.

Results in sporting activities of the Hospital this season, with the notable exception of the Ladies' Hockey Club, are so far rather disastrous. Let us hope that this is merely a passing phase, and that perhaps after Christmas an occasional victory may be seen.

★ ★ ★

MENS' HOCKEY CLUB

Cambridge Tour, October 29th-31st

Results:
v. King's College Drawn 4—4.
v. Jesus College Lost 2—3.
v. Queens' College Lost 3—5.

Although the results suggest otherwise, the annual Cambridge Tour was a great success. For the first time in the season the 1st XI showed their potentialities with some constructive play against teams with well-drilled defences and cunning attacks. The three matches as a result were of a high standard and very enjoyable.

The first match against King's College was played in perfect conditions. Bart's soon settled down to playing a steady and forceful game. The half line did noble work in defending the midfield and on several occasions sent up some fine passes to the wing forwards which R. Jeffreys on the left used with great effect. Our opponents, however, were always ready to make the most of the few mistakes our defences made and managed to lead 3-1 at half-time. The second half became a desperately fought affair, each forward line breaking away but our defence consistently filled the gaps. Before long, with some short passing among the forwards—a goal from B. Holland in the centre, and an incredible goal from H. Walker who took the ball on the right almost to the line, shooting at a seemingly impossible angle—our opponents lead was cut to 3—4.

After several more attacks the equaliser was scored and in the last ten minutes each side in vain fought for a decisive goal.

The match on Friday was against Jesus College. There had been heavy rain overnight and in consequence the ground was fairly slippery. But this did not prevent some very fast play. Bart's drew first blood catching their opponents before they had settled down. But as soon as they had they were swinging the ball from one wing to the other showing their paces as a practiced team. In defence, our backs, H. DaSilva and D. Goodwin proved very reliable and were only beaten by fine forward moves and quick passing. Several times Bart's were beaten to the loose ball and their semi-accurate passes intercepted. The forwards had many attacks cut short by a solid opposing defence. The second half, starting with the score 2—1 down, was an almost constant struggle for the Bart's defence who did noble work in getting the ball up to the forwards on many occasions. But the task made Bart's weary and the Jesus forward line pressed home another goal.

As a last effort Bart's scored off a short corner taken by H. Walker making the final score 2—3.

Our final game, on Saturday, was, as expected, our toughest, for the Queens' College team, we had been warned, was one of the best college sides. The pattern of the match was similar to that of the previous day with Queens' clearly taking the upper hand. Their passing was exemplary and their stickwork confusing. But they certainly did not have it all their own way. Bart's rose to the occasion intercepting many of their midfield passes and using the wings mainly the left with some success. Three-one down at half-time, the second half produced some very hard play usually ending in short corners. Bart's managed to put two goals in, one from a corner, in answer to a cracking goal from the Queens' right inside forward. And to make it quite certain they soon had another in making the final score 3—5.

The tour was a great success showing the team its potentialities and providing three really enjoyable games, quite apart from (unreported) social activities, and the warm hospitality of the three colleges.

The teams were chosen from: A. J. Gordon (capt.); H. DaSilva, D. Godwin, A. Frank, A. Robertson, D. S. Wright, H. R. J. Walker, P. W. Caine, P. A. Bennett, R. Jeffreys, B. Holland, D. N. C. Glover, A. Chant.

LADIES' HOCKEY CLUB
Cambridge Tour

v. Magdalene Rugger Club, Friday, October 30th. Bart's won 2—1

This was a most entertaining game of somewhat unorthodox hockey. Our opponents, in bizarre uniform, towered above us. Nevertheless we managed to keep them fairly well at bay. At half-time Magdalene had scored once. Soon afterwards Bart's equalised and scored a second goal a few minutes before the final whistle, and though Magdalene tried valiantly to score again, they were unable to do so leaving us with a rather surprising victory.

v. Cambridge University 2nd XI. Saturday, October 31. Bart's won 5—2.

After our severe defeat last time by the first XI, we elected this year to play the 2nd XI and found the teams better matched. Unfortunately our opponents were short of a goalkeeper, although this hampered us, too, as it made the offside rule more difficult to observe. The result after a good game was a win for the hospital by five goals to two.

v. Queens' College 1st Hockey XI, Sunday, November 1st. Bart's won 3 2.

Our opponents began the day by entertaining us to sherry before lunch. Once on the field they toyed with us for most of the first half. In the second half we contrived to score three goals and Queens' did not leave themselves quite enough time to catch up. Once more we were surprised to find ourselves the victors. Queens' again proved themselves to be excellent hosts and we spent an entertaining evening in the college.

v. Homerton Training College, Monday, November 2nd. Drawn 4—4.

This was the final match of the tour and the two teams were well matched. The game was a fast one and the result a fair indication of play on both sides. Thus our tour came to a most successful conclusion. It was an enjoyable one, and our thanks are due to all our hosts in Cambridge for their hospitality to us.

The members of the team were: C. Lloyd, J. Tuft, T. Coates, P. Kielty, M. Childe, M. Robertson, S. Cotton, G. Green, J. Swallow, S. Minns, I. Hartley, F. Knight.

SOCCER
Cambridge Tour

The annual tour of Cambridge is always looked forward to mainly because of the prospect of good games and excellent hospitality. This year was no exception when in addition, the revelries of November 5th and Poppy Day were also enjoyed. Particularly memorable was the sight of a poppy seller in the hotel trying to sell his wares to pyjama-clad Bart's players at 8.30 a.m., and the look on a certain member's face when he thought he had broken the hotel's television set. From the football point of view we won one game and lost the other but the showing of the team was good and it is hoped that this tour will mark the turning point in what has so far been a bad season.

Bart's v. King's College. Thursday November 5th. Won 2—0

In ideal conditions Bart's kicked off and started to produce some good football, a pleasing change from the previous match. The forward line combined well and many passing movements which previously had got no further than the training sessions began to emerge. Was it because Prosser had vacated his usual defensive place and moved into the forward line? Well, Prosser thinks so! In spite of all our attacking there was no score before half-time, many power-drives by Prosser going just wide. Turning round, Bart's still kept the initative and were rewarded by the best goal seen this season. Phillips, surrounded by King's defenders drove the ball first time into the top right hand corner of the net. Another goal soon followed when a cross from the left, after being fingered, passed Hore's head by the King's goalie and was banged in by Savage. After this Bart's fell on the defensive as King's pressed our goal, but the defence stood firm until the final whistle.

Team: J. Davies, G. Haig, F. Amponsah, J. Jailler, R. Kennedy, B. Perriss, P. Savage, H. Phillips, B. Hore, D. Prosser, M. Noble.

Bart's v. Trinity Hall. Friday 6th November, Lost2—3.

On a fine plush pitch, Bart's came up against a better team than the previous day, the Hall's fast moving forwards bringing havoc to the Bart's defence. It was not surprising then that Trinity Hall soon scored and quickly followed this with another goal, which was however unluckily disallowed. Little was seen of the Bart's forwards at this stage of the game while Trinity Hall added to their score before half-time. In the second half Bart's showed some fight and reduced the arrears when Haig bore down on the Hall's goalie knocking the ball out of his hand and tapping it into the net. However Trinity Hall increased their lead when Davies misjudged a high lob. Bart's continued attacking, a fine pass by Savage allowing Phillips to score a relatively simple goal. Trinity Hall playing the better football missed many chances mainly through shooting from too far out so Bart's were lucky to end the day only one goal behind.

Team: J. Davies; G. Haig, F. Amponsah; J. Jailler, R. Kennedy, B. Perris; P. Savage, H. Phillips, M. Waterworth, D. Prosser, M. Noble.

HOSPITALS' LEAGUE
1st XI v. University College Hospital Wed. Nov. 4
Away Lost 0-2

Oh, miserable Bart's! A display as poor as the pitch and the weather. Yet in the opening minutes Bart's pressed hard and produced some good passing movements. But U.C.H. luckily scored when Davies didn't quite collect the ball cleanly while diving, allowing a scrambled goal. The heart seemed to go out of Bart's and U.C.H. were made to look a better side than they really were. In the second half the Bart's goal was almost continually under pressure and another goal was conceded. The game crawled on to its dreary end, the cries of a Bart's supporter from the touchline being of little avail. Since we are due to play U.C.H. in the Hospital's Cup the result was exceedingly disappointing.

Team: J. Davies; F. Amponsah, D. Prosser; J. Jailler, R. Kennedy, B. Perris; A. Andan, P. Savege, H. Phillips, L. Fregbulum, M. Noble.

Other Results

Sat. Oct. 31.—A.F.A. Junior Cup, 2nd Round—Bart's 1st XI v. Old Edmontonians Reserves. Home Lost 1-2. Scorer: Iregbulum.

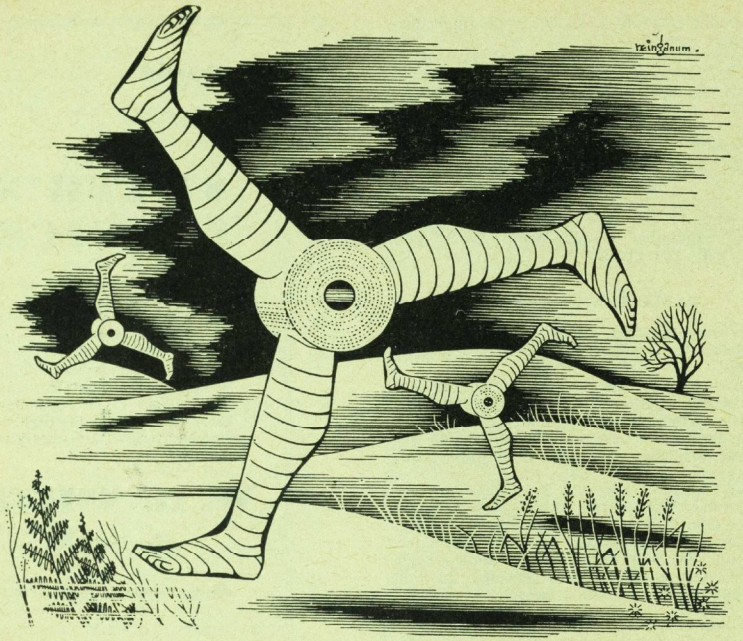
Wed. Nov. 11—St. Bart's 'A' XI v. Normandy Company Sandhurst. Home. Won 3-0. Scorers: Mercer, Perry and Prosser.

TABLE TENNIS CLUB

The officers for this season are A. J. Miller (captain), B. D. Hore (secretary) and B. W. Perris (treasurer).

This season marks the re-entry of the club into the University of London League. A first class table has just been bought and the club meets on Tuesday evenings at 7.30 p.m. The first match was played on November 16 against Goldsmith's College.

Result: Goldsmith's won by 8 matches to 2. As the individual results show the match was by no means as one-sided as the result above suggests. In fact the individual players did well and regular practice on the new table should soon reverse defeats like this. E. Skinebourne playing in his first match showed considerable promise.



AMBULATION...

It is efficient compression bandaging which promotes the healing processes in the ambulatory treatment of leg ulcers — and what better bandage for the work than Elastoplast elastic porous adhesive bandages? Successful compression treatment of leg ulcers means that, as well as efficient and *comfortable* bandaging of the limb, the patient must be ambulatory in every sense of the word. Normal use of the legs prevents recurrence of oedema and prepares the tissues for normal healing.

Elastoplast porous adhesive elastic bandages provide the greatest degree of comfort possible with compression therapy. The adhesive is not spread to the edges of the bandage. This means that the bandage will not ruck and make ridges to irritate the skin. Elastoplast bandages have fluffy edges protecting devitalised skin which is unusually sensitive and liable to trauma under compression.

Limb should first be covered vertically, with overlapping strips of Elastoplast about 12″ long. Small holes should be cut in strips covering the ulcer to permit drainage.

An Elastoplast bandage is then applied from toes to knee, enclosing the heel. Holes are cut in the bandage overlying the ulcer.

An absorbent pad is held in place on the outside of the bandaged leg, so that it can be changed.

Elastoplast

TRADE MARK

ELASTIC ADHESIVE BANDAGES (Porous) B.P.C.

S&N

SMITH & NEPHEW LIMITED · WELWYN GARDEN CITY · HERTS