

ST. BARTHOLOMEW'S HOSPITAL MEDICAL COLLEGE

The Wine Committee

(President: Mr. George Ellis)

announces that the Eighth Annual

Barbecue Ball

will be held at Charterhouse Square

on Friday 12th June, 1970

Attractions to occupy your time between 10 p.m. and 5 a.m. will be:-

THE HARMONY GRASS

Matthew Southern Comfort

The Alan Elsdon Jazz Band

The Playground

The Nightingales Steel Band

The Hawaiian Beachcombers

Discotheque & Full Light Show

Surprise Cabaret at 12.30 a.m.

Additionally the bars will be open until 4 a.m., the barbeque will be available all night with breakfast at 4.30 a.m.

Double Tickets: 6 guineas (Students 5 guineas)

Available to all past & present members of the Student's Union, on application to the Secretary of the Wine Committee.

I apply for tickets at 5 guineas/6 guineas and enclose a cheque made out to St. Bartholomew's Hospital Students Union and crossed "Bar Account" and enclose a stamped addressed envelope.

SAINT BARTHOLOMEW'S HOSPITAL JOURNAL

Founded 1893. Vol. LXXVIII No. 5

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Editorial

Medical students on the whole receive a good press, perhaps due to the apathy about which so much is heard. The L.S.E. are condemned—and rightly so—for their anti-social behaviour and wilful damage to property. Yet they are acting in support of ideals in which they believe, and thus surely deserve more sympathy than the perpetrators of the senseless behaviour at Bart's and Guys in recent weeks.

Students of Medicine have an image—a pre-war legacy, revived mainly by the "Doctor" films—as an irresponsible but hearty group of fine young lads, free to desecrate public and private property and inconvenience others, as long as it is all in "fun." The replacement of this image by a more mature counterpart is long overdue, and is not hastened by recent events.

The wilful damage to Guys and Bart's has been increasing during the last few years. This year the bills are said to be running at £500 for clearing up Bart's, £800 for Guys and £400 for the Richmond ground.

Who foots the bill? Is it the Student Union? and if so, why should we subsidise an irresponsible and immature minority? Can other sports competing in events of similar standing also organise vandalism at the homes of their opponents and get the Student Union to pay? Or will the Hospital pay? Either way, one can immediately think of numerous better ways in which to spend £1,700.

It is only the minority who enjoy this behaviour. The Guys students taking 2nd M.B. and those at Bart's studying for M.B. Path, certainly did not enjoy the disturbances. No more does it appeal to one to be woken at 3 a.m. by some (Bart's) buffoon screaming down the loudspeakers.

By all means let those involved indulge in pranks at the opposition's expense—provided they do not disturb those who are not concerned and do not cause stupid and unnecessary damage. There are subtler ways of demonstrating our superiority than kidnapping "hostages" and parading them at breakfast, a most embarrassing performance reminiscent of incidents at primary schools and also very annoying to the majority of residents who were not involved and to whom breakfast was refused.

Please, let the Student Union come out and actively discourage this behaviour, rather than encouraging it. Let us have no more subsidised vandalism.

Letters to the Editor

THE JOURNAL

The Editor, *St. Bartholomew's Hospital Journal*
19th March, 1970

Dear Editor,

Once again the claim is made, in your "Managerial" of March 1970, that the Journal has appeared every month since 1893. As I have pointed out on a previous occasion, this is false. At the start of the 1939-45 War, the Editor left London for the country and the Journal failed to appear for about three months. This so incensed certain members of the Junior Staff and of the Student Body that a substitute, entitled *Argent and Sable*, was produced under the managership of the late "Bunny" Sullivan and the joint editorship of Donald Crowther (now on the editorial staff of the *B.M.J.* and father of Andrew) and of your erstwhile correspondent (now ex-editor of the *Proc. Roy. Soc. Med.*).

G. HAVERFORDWEST
(pronounced: Harvest).

THE CUP FINAL

The Editor, *St. Bartholomew's Hospital Journal*
24th March, 1970

Dear Editor,

Along with a host of good-humoured old Bart's men and their wives and old Guy's men and their wives, I went to Richmond to see the Cup Final, and was, of course, delighted with the result and the manner of its achievement.

The afternoon was, however, marred for many by the puerile and incessant braying of a group of Bart's students in the stand, announcing "we are the champions" (which we already knew). This was tolerated along with other puerile manifestations—the flour throwing and the daubing of other people's property with slogans—even accepted as part of the show. However, the shouting of obscene, filthy and unprintable epithets at members of the Guy's team by this same group is not to be tolerated. It caused obvious distress to all within earshot, and this letter of protest is written to the "Journal" in the hope that it will be drawn to the notice of the youth or youths responsible, and that next year they will either stay away or go down to the field where these obscenities can be carried away by the wind.

When I see Bart's win the Cup, I do not like to be made to feel ashamed of being a Bart's man.

Yours faithfully,

C. K. VARTAN,
F.R.C.S., F.R.C.O.G.,
Consultant Gynaecologist.

Announcements

Engagement

BOSTOCK—BEATON—The engagement is announced between Mr. J. F. Bostock and Miss S. A. M. Beaton.

Marriage

FELIX-DAVIES—SLY—On March 14, Dr. Derrick Felix-Davies to Joan (Annie) Sly.

Births

KENNEDY—On March 8, to Jill and Dr. Robert Kennedy, a daughter (Victoria).

POGMORE—On March 24, to Trina (née Waterman) and Dr. John Pogmore, a son (Simon John).

Royal Photographic Society of Great Britain

The Pharmaceutical Society junior's trophy has been awarded to Miss G. Hodges. A Medical Group merit award has been given to Mr. W. D. Trendinnick, both of the Department of Medical Illustration.

Royal College of Surgeons of England

The HALLET prize has been awarded to Dr. R. C. N. Williamson.

Fellowship diplomas

These have been granted to the following Bart's men:—

*FOX, Geoffrey Charles
SHAND, William Stewart
DUPRE, Philip Charles
†STRONG, John Richard
STEPHENSON, Timothy Patrick
WISE, Kenneth Stanley
PHILLIPS, Hugh
*in otolaryngology †in ophthalmology

Change of Address

As from March 25, the address of Mr. Norman Capener, F.R.C.S., for Consultations and Professional Correspondence will be at 48 Polshoe Road, Exeter, EX1 2DS.

JUNIOR REGISTRARS IN MEDICINE

APPLICATIONS ARE INVITED for three posts of JUNIOR REGISTRAR IN MEDICINE as under:-

MEDICAL PROFESSORIAL UNIT : from 1st October, 1970
SIR RONALD BODLEY SCOTT & Dr. Gibbs Firm : from 1st November, 1970
DR. HAYWARD & Dr. Wykeham Balme's Firm : from 1st November, 1970

All three posts are tenable for one year from the dates stated, and the Salary Scale will be that of a Senior House Officer in the National Health Service.

Applications, with the names of two referees, should reach the undersigned by Monday, 8th June, 1970. (Application forms are available from the Medical Staff Office.)

J. W. GOODDY,
Clerk to the Governors.

Notice

Pre-Registration House Posts

In future Pre-Registration House Officers will be appointed to each general medical and surgical firm at three monthly intervals. The appointments to be of six months duration. The first batch of these appointments will start on 1st July, 1970, and the appointments will therefore follow for 1st October, 1st January, 1st April and 1st July.

In order to fill the 10 vacancies created on 1st July, one House Officer on each firm will be asked to extend his appointment by three months. Where neither House Officer is willing to do this, a locum will be appointed for three months. The Appointment Committee for the posts starting on 1st July will meet as soon as possible after the London final results are announced. The Committee making the appointments for 1st October will meet in late July, thus allowing unsuccessful candidates ample time to apply for other posts. Some of the posts allocated in Regional Hospitals will also follow this three monthly alternating arrangement but this cannot apply where only one Houseman is allocated to a Hospital. It is, therefore, likely that more posts will be available on quarterly dates. In general Housemen are advised to take a post in an outside hospital or the Region as their first appointment, and only to apply for a post at St. Bartholomew's after gaining this experience. This arrangement is not inflexible and newly qualified men and women are certainly not barred from applying for a post at St. Bartholomew's as their first one. As a general rule Housemen will not be appointed to two pre-registration posts at St. Bartholomew's thus

giving the greatest number of people the chance of a post at the Teaching Hospital.

I. M. Hill,
Sub-Dean of the
Medical College.
9th March, 1970

Nurses' Report

Following a recent survey, radical alterations have been going on in the nurses' dining room.

There are new red chairs and serving shelves over which are suspended high powered electric light bulbs which keep the food 'hot'. The latest and most surprising addition has been the installation of 14 vending machines, which it appears will almost completely take over from the 'personal' service we are receiving at the moment.

The 14 machines will consist of: 3 hot drink machines (fresh tea, coffee, chocolate), 2 sweet machines, 1 snack machine, 1 milk machine, 1 cold drinks machine, 2 merchandises containing main courses and snack meals and 4 microwave ovens.

After placing money in the machine and pressing a selector button, the food comes out. It sounds easy but, (a) the correct change is required and thus 2 change machines have been installed and (b) the main dishes and snacks have to be heated in the microwave ovens. A special time key is provided with the meals. This process is going to take over a minute and with only 4 ovens the queues could be very long.

This experiment was launched on April 1st and we hope that it will not prove rather expensive one for the King Edward's Hospital fund for London.

ROS ASPDIN

Great Hall Concert, March, 1970

It is not often that concerts, especially amateur, convey to the audience that music is enjoyable and even can be fun. The disproportionate prominence of certain nineteenth century composers of gloomy disposition has smothered this idea and given music a formal setting, with the absurd obsession that seriousness must prevail despite the music. This reached a much needed *reductio ad absurdum* when a Festival Hall audience dutifully applauded a concert of "probabilistic music (in which beautiful coincidences were promised) by Xanarkis and an IBM-50. When asked by one bewildered performer why the audience had clapped, another replied, "Because they are a load of stupid . . . s." One felt that Xanarkis and his witless computer were well aware of this. Far from being probabilistic the Bart's concert even lacked the stochastic incidents which often abound in amateur music, and the well-chosen programme was performed to a high standard both in technique and musicality.

The concert opened with the third of Handel's six violin sonatas played by Martin Gillett, accompanied by John Allen. Their interpretation of the Largo stood out in a good performance. String players of quality are rare in amateur music, some degree of technical mastery being required before they even cease to sound frankly unpleasant. We are lucky to have a player of Gillett's ability in Bart's.

Two wind quintets were well performed by Paul Swain, Michael Jameison, Steve Karrington, Ivan Mosely and Janet Hayes (the only imported player). The first, Haydn's *Divertimento in Bflat*, containing the Saint Anthony Chorale, subsequently mortalised in a set of variations by dull old Brahms, is quite a jolly piece and was well received. The second quintet was by Ivan Mosely, a radiologist at Bart's. It is nice to appreciate that music is created by real, live human beings and not merely found in attics in and around Germany. Most compositions by enthusiasts are either execrable or instantly recognizable. Mosely's quintet was neither, and well deserved its place amid the more well known. The composer was warmly applauded when he returned to the platform, though it was just to remove his music stand.

Wind instruments predominated in the programme, and apart from the quintets, Swain and Warrington played an unusual set of variations for flute and clarinet by Ciaikovski, a contemporary composer. In a spasm of bewilderment all the programme notes could struggle to say was that "they achieve great rhythmic variety in a remarkably short time." Whether this referred to the music or the musicians was not quite clear. However, this unilluminated remark failed to mar the audience's enjoyment of this unashamedly trivial music of great charm, and blessedly without any pretention.

The Cantata Singers, under the direction of John Allen, performed three madrigals in the first half and the Bach motet "Jesu, Priceless Treasure" as the last

item. Some of them actually look as though they enjoy singing, which is a great stimulus for the audience to enjoy listening. They sang to their usual high standard, and the motet, a difficult and serious work, fully deserved the enthusiastic applause it received.

Perhaps the high point of the concert was Cynthia Fung playing a Liszt etude. Much technical ability is needed to cope with the plethora of notes and express the beauty of this piece. Cynthia Fung coped magnificently and was afforded thunderous applause. It is unfortunate that using the Great Hall precludes the Music Society from having a grand piano.

The informality which mercifully prevailed at this concert in no way detracted from it as a musical occasion, and engendered a sense of enjoyment in both performers and audience. Sadly, the audience was not as large as one might have hoped, and could not provide the volleys of synchronous coughing between movements that are the true hallmark of having arrived in the concert business.

David Thompson.

The Wine Committee Annual Smoker, 1970

"Womb with a View"

produced and directed by *Tim van Zwanenberg*.

Opinions differ as to the best night to attend the Smoker, the choice available being Wednesday or Friday (both sexes) sandwiching an all-male dinner jacket affair on Thursday. The Stag event has its advantages in the often amusing additions supplied by a drunken yet receptive audience, but suffers from some of the disadvantages usually associated with College Hall bar on Cup Final night. From all report, this year's Stag was quieter than it has been previously but for a variety of reasons my attendance was on Friday.

The overall impression was very good indeed, and although the Smoker is by nature reasonably informal, the acting and production were extremely professional. Each sketch was followed by the next with no obvious disaster intervening, while considerable tracts of prose were delivered with great confidence and clarity. The material as always was to some degree unoriginal or related to other productions (previous smokers?) but suffered from this hardly at all. Robert Robertson's "Secreted Reagent" was a case in point, and although there have recently been a number of similar reviews on radio or Ward Shows, it was still highly enjoyable and well constructed. The "WIIICH" report on Disease from Kate Walker and Nick Whyte recommended Glandular Fever (also known as Coulson's Disease) as this year's 'Best Buy' due to its allowance of two weeks rest with minimum discomfort and pain in the

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cholesterol and triglyceride
levels, and returns towards
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highest WHICH traditions of complete impartiality. The seductive Angela Kirby produced a predictable reaction from a Bart's audience, and by now we have almost come to associate George Blackledge with bedroom farce. The songs sung by Angie, Kate and others, and the music from Patch Venables Mike and William showed stark simplicity and originality, and was very impressively executed.

On a final note, although the second half undoubtedly contained a better script than the first, enjoyment of the second was increased by the supply of free wine during the interval, but all members of the cast and the Production team are to be congratulated on a very successful Smoker.

JOHN LAIDLAW

Recent Papers by Bart's Men

- ALMENT, E. A. J. The elderly primigravida. *Practitioner*, 204, pp. 371-376.
- ANDREWES, Sir Christopher Howard. Hong Kong influenza. *W.H.O. Chronicle*, 24, 1970, pp. 89-98.
- BAILEY, A., (and others). Cephalixin—a new oral antibiotic. *Postgrad med. J.*, 46, 1970, pp. 157-158.
- CHALSTREY, L. J. Clacifying epithelioma of Malherbe. *Brit. J. clin. Pract.*, 24, 1970, pp. 131-133.
- *CHAMBERLAIN, D. A., (and others). The effect of paired atrial pacing on left atrial and ventricular performance in the dog. *Cardiovasc. Res.*, 4, 1970, pp. 116-126.
- COOKE, E. Mary (and others). Hospital food as a possible source of *Escherichia coli* in patients. *Lancet*, Feb. 28, 1970, pp. 436-437.
- DARMADY, E. M., (with others). Toxic metabolic defect in polycystic disease of kidney. *Lancet*, March 14, 1970, pp. 547-550.
- DAWSON, A. M., see DYER, N.H., and—.
- DYER, N. H., and DAWSON, A. M. Diagnosis of Crohn's disease. A continuing source of error. *Brit. med. J.*, March 21, 1970, pp. 735-737.
- FISS, G. R. Carpal instability and the fractured scaphoid. *Ann. Roy. Coll. Surg.*, 46, 1970, pp. 63-76.
- FOULKES, Alwena L., see COOKE, E. Mary, and others.
- FRANKLIN, A. W. Paediatrics. *World Med.*, Feb., 1970, pp. 61-62.
- *GIBBS, Dorothy A., and WATTS, R. W. E. The action of pyridoxine hyperoxaluria. *Clin. Sci.*, 38, 1970, pp. 277-286.
- GREEN, N. A. Cryosurgery of the prostate gland in the unfit subject. *Brit. J. Urol.*, 42, 1970, pp. 10-20.

United Hospitals Guinness Stroll : 1970 May, 16

Take thou gentle exercise 30mins. (followed by tie).
Tinct. Guinness per os, q.d.s.
Infusion Bovril per os, q.d.s.
Sandwiches, p.r.n.
Transport: by 41-seater ambulances to place of treatment and back to London.
Followed up: in November, at the Guinness Dispensary, Park Royal.
Costs (not covered by BUPA): 25—37½ N.P.
Consent forms (giving full details): available now.

Gastroenterology Supplement

This article is the 5th in our series of 6 on Gastroenterology. The first four appeared in the April issue and the sixth will appear in the June Journal, thus completing the Gastroenterology Supplement.

No. 5 Mesenteric Ischaemic Disease

by Alan Edwards

Introduction

The gut plays a crucial role in the survival of man for it is by this organ that he absorbs all those substances necessary for the maintenance of life. Yet while such a glib phrase is self evident it gives little idea of the enormous exchange of fluids, with precise and critical selective absorption of ions and colloids, that occurs. Nor does it indicate the extremely rapid turnover of mucosal cells that occurs presumably as a necessity of its function. Furthermore there is within the large bowel a huge reservoir of potentially dangerous bacteria whose noxiousness is kept at bay by the vitality of the colonic mucosa. It is small wonder then that this organ must be supported by a rich blood supply to sustain such strenuous activity and that any inadequacy in this parameter causes profound alteration in vitality, motility, absorption or resistance to bacterial invasion. It is perhaps, therefore, surprising that awareness of this potentially precarious situation is relatively recent and that surgical approaches to the problem quite modern.

One hundred and twenty seven years ago Tradman described the catastrophic effect of mesenteric arterial occlusion and coined the phrase of "mesenteric crisis". In 1868 however Chienne drew attention to the importance of the very full collateral circulation in the gut by injection studies in the post mortem room on an elderly woman whose three mesenteric arteries had become occluded in association with a syphilitic aortic aneurysm without apparent impairment of her guts.

In 1901 Schnitzler wrote in German of the symptoms of visceral ischaemia ("mesenteric angina") and the continental literature contained many references to this subject before Klein, in 1921, published his classical and authoritative first English language account. In this he asserted that occlusion of the superior mesenteric artery could be accompanied by one of three effects viz.

1. the establishment of a "competent collateral circulation"
2. the maintenance of a circulation "sufficient for the life of the parts but not for function"
3. intestinal infarction

While no better classification exists today it is now realised that these subdivisions are not static but that there is an inevitable tendency for a patient to proceed from one to the other.

In 1951 Klas ended the era of simple description of mesenteric ischaemia by reporting an unsuccessful attempt to treat it by mesenteric embolotomy and although this was successfully achieved by Stewart in the same year, he did not report it until 1960. From then, however, the scope of surgical endeavour widened and in 1958 Shaw described a successful superior mesenteric endarterectomy. In 1962 Morris reported further successful cases and underlined the importance of aortography in the diagnosis of mesenteric ischaemia and from then on revascularisation procedures directed towards the gut arteries have become orthodox.

In 1963 a third phase in the history of the description of visceral arterial disease was opened by Harjola when he attributed abdominal pain to fibrosis of the coeliac ganglion. Two years later Dunbar launched the "Coeliac Axis Compression Syndrome" in which external compression of this arterial axis was suggested as a cause of pain and in 1966 Marable incriminated the median arcuate ligament of the diaphragm as a compressive agent responsible for this syndrome. Although over sixty cases have been reported there is considerable theoretical objection to the idea that obstruction of a single visceral artery could cause simple visceral ischaemia and at Bart's we view this syndrome with extreme caution. (Edwards et al 1970).

Features of Mesenteric Circulation

The mesenteric circulation is based upon the three primitive arteries to the fore, mid and hind guts. These three arterial axes viz., the coeliac, superior mesenteric, and inferior mesenteric arteries may be considered as input vessels into a highly developed distributive system. The relative sizes and therefore dominance of these three arteries appear variable but distribution between them is so good this appears immaterial for the field of supply of one artery can easily be taken over, through the rich collaterals, by another. Further there is such a large inbuilt reserve capacity with the system that two of these arteries (or the equivalent reduction in the total lumenal area to one 1/3 of the sum of the three vessels) can be

sustained before symptoms of ischaemia become manifest. (Dick et al 1967). Such an arrangement is by no means unique for the Circle of Willis supplied by the four "extracranial brain arteries" (viz the carotids and vertebrals) is an almost exact parallel.

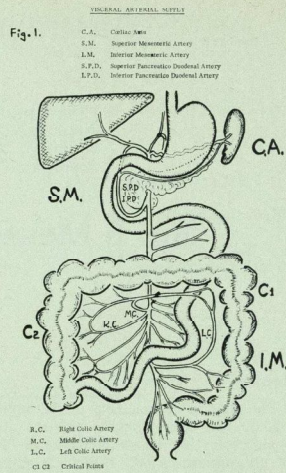
Anatomical Factors

Fig. 1 is a sketch of the gut and its arteries. The coeliac axis (C.A.) supplies the stomach, duodenum and pancreas and anastomoses freely with the superior mesenteric artery (S.M.) through the superior (S.P.D.) and inferior (I.P.D.) pancreaticoduodenal arteries. This artery supplies the small intestine, ascending and transverse colon, anastomosing with the inferior mesenteric artery (I.M.) via the right (R.C.) and mid (M.C.) colic arteries and the left colic (L.C.). Running in the mesentery therefore of the colon there is a good collateral vessel, the marginal artery of Drummond, linking the inferior and superior mesenteric arteries. Fig. 2. At the splenic flexure the anastomosis between the middle colic and left colic arteries interrupts this vessel and constitutes the most important "critical point" (C1 Fig. 1) of the colon circulation. This critical point of Griffiths (Griffiths 1956), is of far greater importance than the classical but inaccurate critical point of Sudek beloved by the anatomists. It is also true however that the ascending side of the colon has no marginal artery so that it too has end artery vulnerability and constitutes the second critical point (C2) in the colonic blood supply. These two critical points have importance in the distribution of ischaemic bowel disease.

The blood supply to the gut may be subdivided into three groups of vessels. Fig. 3 attempts to characterise by reducing the vessel pattern to a dollar sign. The three main trunks (1) feed into the S of the dollar which distributes the blood between them. Arteries of delivery (2) then carry blood to the organ concerned where they subdivide into end arteries (3) (e.g. vasa recti). Occlusion of the vessels in these three groups is caused by different disease entities, associated with differing effects, and characterised by differing determinant factors (see Table I). The effect of the occlusion of one of the three major input arteries or trunks is almost entirely determined by the speed of its occurrence. The sudden ictic effect of an embolism may cause major and extensive gangrene. The slow silting up by atheroma of the artery or its ostium to the aorta or external strangulation can be totally without effect if there is time for rich collateral potential to become operative. However it is now well recognised that this slow process can at any time be precipitated by occluding thrombus into ictic proportion. There is within this group the coeliac axis compression syndrome in which extrinsic obstruction effect is intermittent and constitutes therefore a special entity.

The effect of occlusion of the arteries that distribute the blood between the trunks (viz. the named arteries) is determined almost entirely by the site of artery involved. The diseases involved are atheroma, arteritis and polyarteritis nodosa and it is at this level that the critical points are so important.

The occlusion of the arteries of delivery (the vasa recti and beyond) is usually associated with the collagenoses and is often a minor part of a generalised disease and the gut effects are overshadowed by the



R.C. Right Colic Artery
M.C. Middle Colic Artery
L.C. Left Colic Artery
C1 C2 Critical Points

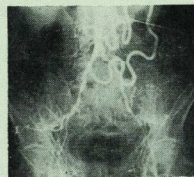


FIG. 2. Enlarged artery of Drummond, like a large vein, demonstrated ischaemia in a man with severe peripheral arterial disease.

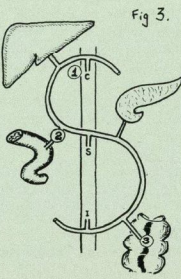


FIG. 3. SITES OF ARTERIAL OCCLUSION

1. Main Trunks 2. Coeliac Axis
2. Artery of Delivery 3. Superior Mesenteric Artery
3. End Artery 4. Inferior Mesenteric Artery

systemic features of that disease. Griffiths has shown, by injection studies, basic differences in the arterial patterns of the colon in ulcerative colitis and Crohn's disease (the former involving much more distal vessels than the latter), but whether these are primary or secondary features of the pathology of these diseases is presumably a matter of conjecture.

There are however special features of the mesenteric circulation that may render it peculiarly vulnerable to circulatory disturbance. It is devoid of baroreceptors and therefore cannot be protected by reflex local vaso-motor adjustments, nor can the cardiac output or peripheral resistance be adjusted to its need. This feature combined with the high metabolic activity and rapid cell turnover makes it possible for intestinal gangrene to occur with patent mesenteric vessels in situations of low cardiac output. Welch showed in 1920 that if the pressure in the superior mesenteric artery fell to 25% of systemic then infarction of the entire small intestine results. Furthermore there are plentiful a/v shunts in both stomach and colon to complicate blood flow problems. The mesenteric venous pressure is considerably higher than systemic so that circulation through the gut tissues is more greatly handicapped than that through systemic organs in situations of reduced arterial pressures. The absence of valves in the portal system also makes it different from the systemic system. Arterial insufficiency or occlusion is accompanied by congested bowel as blood runs back from the portal tree further embarrassing the failing tissue perfusion. Thus these five factors of baroreceptors, a/v shunts, high venous pressure, absence of valves and high metabolic activity render the bowel especially susceptible to disturbances of blood flow, and this is only partially compensated for by the huge collateral reserve.

Clinical Features of Mesenteric Ischaemia

This discussion is confined to the first two subdivisions in Table I.

TABLE I. MESENTERIC ARTERY OCCLUSION

TYPE OF ARTERY	DETERMINANT	FEATURE	AETIOLOGY
1. INPUT (TRUNK)	TIME	1. CONTINUOUS	Embolism Occluding 60%
		2. INTERMITTENT	Atheroma Occluding 40% Elastic
2. DISTRIBUTION (NAMED ARTERIES)	SITE	1. "Critical point"	Median Arcuate Ligament
		2. DISTURBANCE	Arteritis Collagen disease (Polyarteritis Nodosa)
3. END ARTERY (INCLUDING AND BEYOND VASA RECTI)	GENERALISED DISEASE	Other Stigmata	Gangrenous disease

N.B. Gut ischaemia can occur with open arteries and hypotension.

Acute Mesenteric Occlusion

This is usually based either on embolism or occluding thrombosis and of recent years the latter has become the more important and it is currently estimated that 60% of acute occlusions are due to local atheroma.

By virtue of its size and angle of take off the superior mesenteric artery is the most common of the abdominalortic branches to catch an embolus and it is usually this vessel that is involved in a mesenteric crisis. This artery is also commonly the site of atheromatous disease (Derrick et al 1959), and the roughened intima may, under conditions of reduced cardiac output, e.g., congestive heart failure, coronary thrombosis, or shock sustain a sudden occluding thrombosis which will, if the initial disease was insufficient to have induced collaterals, have much the same features as an embolus.

The presentation is one of an acute abdominal emergency with pain grossly disproportionate to signs. Indeed the paucity of physical signs makes the diagnosis very difficult and delay in treatment occasioned by periods of observation common. This is of course fatal, for conclusive physical signs only become evident when the viability of the gut is lost and the patient is exposed not only to the grave hazard of intestinal gangrene, but also to the extirpation of most of the intestines. Mortality in this condition is still near 90% and is unlikely to be reduced unless treatment is aggressive and early. In Mavor's Scottish series 70% of patients with acute superior mesenteric occlusion had abdominal pain for 12 hours and 35% had severe symptoms for over 24 hours before admission to hospital (Mayor et al 1962). The avoidance of the delay period during which ischaemic bowel dies depends upon entertaining a high index of suspicion towards the diagnosis, for it might be said that it often rests, rather like that of angina pectoris, on history alone. Any patient therefore, with a known history of cardiovascular disease or signs of peripheral vascular disease who presents with severe abdominal pain often of precise and sudden onset yet obscure origin, should be very seriously considered for immediate laparotomy. In the early stage findings on physical examination may be confined to some generalised tenderness, without distention, muscle spasm or signs of peritoneal irritation. Bowel sounds may be present and relatively normal. This combination of severe symptoms without signs has the strong suggestion of a functional disorder and I can still vividly remember the first case I recognised. A 58 year old woman with a previous coronary thrombosis was confidently diagnosed as an hysteric by the duty medical team, yet her bowel was black at laparotomy later that day and who subsequently died within 48 hours. The diagnosis in the potentially curative stage is extremely difficult for there is no helpful test except, perhaps, angiography. A plain film of the abdomen is characterised by an absence, or minimal amount, of air in large and small bowel although later when ileus has become established distended, gas filled, loops can be seen.

Later when gangrene has become established the initially quickly pain becomes continuous, bloody fluid may be passed per rectum or vomitted and the patient may become shocked with obvious signs of peritonitis. Pyrexia, leucocytosis and increased lactic acid dehydrogenase lend support to the, by now, obvious diagnosis.

This is an entity in which the degree of ischaemia is insufficient to cause death of the intestines but is sufficiently severe to limit their function. It is an exact parallel to intermittent claudication or angina pectoris. Pain is related to food in much the same way that it is to exercise in these other two conditions. The bigger



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the meal the worse the pain and this becomes so marked a feature that patients develop a fear of food. The classical syndrome of mesenteric angina is based on the triad of prandial pain, weight loss and diarrhoea. How much this weight loss is due to malabsorption and how much to inanition is difficult to determine. Certainly diarrhoea has not always been a marked feature of the cases seen at this hospital, which is rather against malabsorption being a dominant factor.

Patients are middle aged and have signs or symptoms of peripheral vascular degenerative disease. This, I believe, to be an important diagnostic feature for one might hesitate to expose a patient to the risk of angiography to establish this diagnosis, if all peripheral pulses were present. Another feature of the admittedly small number of cases seen at Bart's has been the absence of hypertension even in the face of marked peripheral vascular disease.

The diagnosis is established by angiography when significant blockage of vessels may be demonstrated. Fig. 4 and 5 show a block, (marked with the black arrow) of the superior mesenteric artery with snaking collateral vessels. Barium follow through (fig. 6) is also abnormal with thickening of the mucosal folds suggestive of ischaemia. Other investigative procedures are disappointing and although it is claimed that Xylose and Vit. B₁₂ absorption tests may be abnormally low this is by no means reliable and often the results are only borderline. Recently Marston has suggested that a protein losing enteropathy can be demonstrated by using radioactive chromium and that this may be reversed after reconstructive surgery. This looks to be a very promising investigation.

Treatment of Mesenteric Ischaemia

Once the diagnosis of mesenteric ischaemia has been established then treatment is a matter of urgency. In acute mesenteric infarction the time scale is very short for the aim of treatment is to restore the blood flow to the intestine before gangrene is established. This is achieved by embolectomy or disobliteration. Obviously gangrenous gut must clearly be excised but the problem of doubtful viability is very real and there is a place for returning such bowel to the abdominal cavity under heavy antibiotic cover, closing the incision temporarily, and reviewing the situation at a second operation twelve hours later when the limits of demarcation will be more obvious.

Even in chronic mesenteric ischaemia time is important and should be measured in hours and not days, for the gut is teetering on the brink of vascular disaster and can plunge into the acute phase even while awaiting surgery. Thus, if the next available scheduled operating list is too far away, then surgery should be undertaken as an emergency.

Fig. 7 endeavours to summarise the revascularisation procedures commonly employed. Although the superior mesenteric artery is often the chief culprit, its origin, under the pancreas, is not easily accessible. This is also, to a lesser extent, true of the coeliac axis. However if the blood supply can be increased into any one of the three main trunks then the free collateral between them will distribute it equitably. Hence

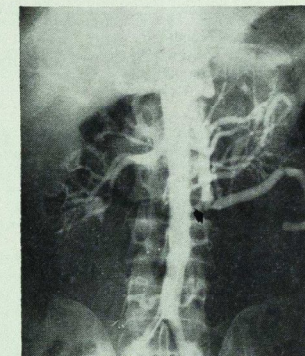


Fig. 4

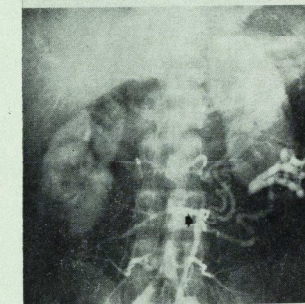


Fig. 5

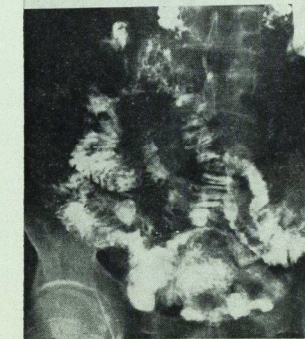


Fig. 6

surgery is usually directed towards that which is safest and easiest rather than that which is theoretically most perfect. More blood may be put into the coeliac axis via the splenic artery which can be anastomosed to the left renal or to a vein graft connected to the iliac or aorta. The superior mesenteric can be revascularised with a dacron graft to the aorta, or by direct side to side anastomosis with the aorta or right iliac. The inferior mesenteric artery, alone, lends itself to disobliteration and patching.

Ischaemic Colitis

Arterial disease of the arteries of distribution (table 1) has its major effect at the critical points (fig. 1). The recognition of ischaemic colitis is relatively recent and is characterised by sudden inflammation in the region of the splenic flexure which is followed by gangrene, progressive stricturing or resolution according to the degree of ischaemia. (Morston et al 1966). This may occur spontaneously as a result of arterial disease or sometimes be precipitated by aortic surgery. The clinical features of the disease are the abrupt onset of lower abdominal pain with vomiting and fever with the passage of bright blood per rectum and a leucocytosis. Plain abdominal films show dilatation of the colon similar to acute toxic dilation of proctocolitis. If the ischaemia is sufficiently severe to produce gangrene then a surgical emergency is occasioned necessitating defunctioning, excision or drainage according to conditions. In cases of less severe ischaemia a stricture is produced which may resolve or progress. The radiological features on barium enema examination are fourfold viz. "Thumb printing", saw tooth irregularity, tubular narrowing and saccululation. Fig. 8 shows such a case with thumb printing in the descending colon and saccululation near the splenic flexure. Progressive stricturing has of course to be treated by surgical extirpation.

Conclusion

The importance of disturbance of the vascular supply to the gut either as a primary cause or as a secondary manifestation of enteric disease is being increasingly recognised and is, I believe, a field in which considerable advance is imminent.

SHORT LIST OF REFERENCES

- Derrick, J. R., Pollard, H. S., Moore, R. M., 1959, *Ann. of Surg.*, 149, 684.
- Dick, A. P., Graff, R., McGregg, D., Peters, N., and Savner, M., 1967, *Gut*, 8, 206.
- Dunbar, J. D., Molnar, W., Beman, F. F., Marable, S. A., 1965, *Am. J. Roetgen.*, 95, 731.
- Edwards, A. J., Hamilton, J. D., Nichol, W. D., Taylor, G. W., and Dawson, A. M. 1970, *Brit. Med. J.*, 1, 342.
- Griffiths, J. D., 1956, *Ann. Roy. Coll. Surg. Engl.* 19, 241
- Klein, E., 1921, *Surg. Gynaec. Obstet.*, 33, 385.
- Marable, S. A., Molnar, W., Beman, F. M., 1966, *Am. J. Surg.* 111, 493.

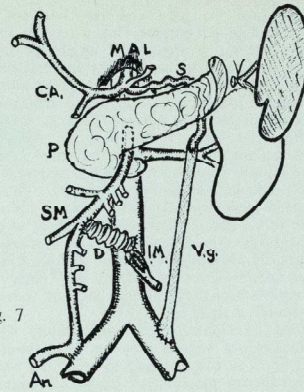


Fig. 7

REVASCULARISATION PROCEDURES

M.A.L.	Median Arcuate Ligament
C.A.	Coeliac Axis
S.	Splenic Artery
P.	Pancreas
S.M.	Superior Mesenteric Artery
D.	Dacron Graft
I.M.	Inferior Mesenteric Artery with Patch
V.g.	Vein graft
An	Anastomosis between S.M. and Common Iliac

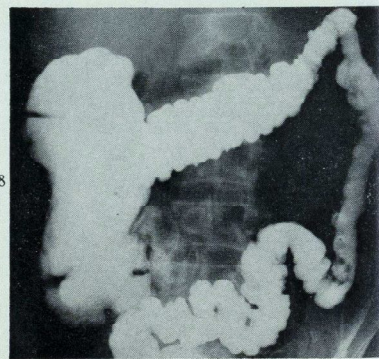


Fig. 8

Ischaemic Colitis with thumb printing and saccululation

- Marston, A., 1964, *Ann. Roy. Coll. Surg. (Engl.)*, 35, 151.
- Marston, A., Pheils, M. T., Thomas, M. L.,

- Morson, B. C., 1966, *Gut*, 7, 1.
- Mavor, G. E., Lyall, A. D., Chrystal, K. M. R., and Tsapogas, M., 1962, *Brit. J. Surg.*, 50, 219.

PHYSICAL AND RADIOLOGICAL DIAGNOSIS

No. 3

DISORDERS OF CARDIAC RATE AND RHYTHM

by Barry Grimaldi

The conducting system of the heart is composed of cells which have the property of spontaneous, rhythmic depolarisation. This inherent rhythm is fastest in the SA node, so that normally this acts as the cardiac pacemaker, maintaining the heart rate about a mean of 120 p.m. in infants to 70 p.m. in adults.

If the SA node is depressed, cells further down the pathway of conduction take over the task of pace-

maker at a slower inherent rate.

When a focus outside the SA node initiates the cardiac impulse this is known as an Ectopic Beat. These may occur singly, or in runs as an Ectopic Rhythm, or Tachycardia. With this in mind, it is convenient to think about the Arrhythmias according to the site of initiation of the impulse:

CLASSIFICATION

(1) MEDIATED BY SA NODE	SINUS ARRHYTHMIA SINUS TACHYCARDIA SINUS BRADYCARDIA
(2) SUPRAVENTRICULAR ARRHYTHMIAS (Pacemaker in atria or AV node)	SUPRAVENTRICULAR ECTOPIC BEATS SUPRAVENTRICULAR TACHYCARDIA ATRIAL FLUTTER ATRIAL FIBRILLATION
(3) VENTRICULAR ARRHYTHMIAS	VENTRICULAR ECTOPIC BEATS VENTRICULAR TACHYCARDIA VENTRICULAR FIBRILLATION

(1) MEDIATED BY THE SA NODE

SINUS ARRHYTHMIA: This is the normal speeding up of heart rate during inspiration, and slowing on expiration. It is particularly marked where Vagal tone is high, e.g. young children.

Sinus arrhythmia disappears in Heart Failure and in atrial Septal Defect.

SINUS TACHYCARDIA: A rate above 100 p.m. still under control of the SA node.

CAUSES: Exercise
Anxiety
Shock
Heart Failure

Fever
Anaemia
Carditis
Thyrotoxicosis

DIAGNOSIS OF REGULAR TACHYCARDIAS

The causes of a regular high pulse rate can be distinguished at the bed side with the aid of nothing but a thumb: Massage of the Carotid Sinus on ONE SIDE causes the following effects:

SINUS TACHYCARDIA: Slight slowing of rate.
SUPRAVENTRICULAR TACHYCARDIA: Either abruptly restores sinus rhythm, or no effect.
ATRIAL FLUTTER: Abruptly slows heart to half the previous rate, by increasing the degree of Atrioventricular block.

VENTRICULAR TACHYCARDIA: No effect.

SINUS BRADYCARDIA: A rate below 60 p.m. still under control of the SA node, and with normal conduction.

CAUSES: High Vagal Tone, e.g. Athletes
Myxoedema
Obstructive Jaundice
Raised intracranial pressure
After viral infections, such as 'Flu

(2) SUPRAVENTRICULAR ARRHYTHMIAS

SUPRAVENTRICULAR ECTOPIC BEATS: Discharge from an ectopic focus in the Atria or AV node causes a premature beat often followed by a compensatory pause.

Atrial and AV Nodal ectopic beats may be distinguished on the E.C.G. but for clinical purposes can be lumped together.

Cannon waves may be seen in the J.V.P., caused by the Atrial contraction against a closed Tricuspid valve.

CAUSES:

- (1) Occasional Ectopic beats are common in healthy people
- (2) Frequent ectopic beats may occur as a prelude to AF in Ischaemic, Rheumatic or Thyrotoxic Heart Disease.

E.C.G.: ATRIAL ECTOPIC BEATS:

- (1) Inverted or Deformed Ectopic P waves (P')
- (2) Normal QRST following each one.

NODAL ECTOPIC BEATS:

- (1) P wave inverted and AFTER QRS
- (2) Normal QRST sequence.

TREATMENT: If there is evidence of heart disease, Digoxin may be given to control the arrhythmia that invariably follows. Otherwise no treatment is necessary.

SUPRAVENTRICULAR TACHYCARDIA: An ectopic focus fires off regularly at about 200 p.m. with a 1:1 ventricular response.

CAUSES:

- (1) 60% have a normal heart
- (2) Heart disease, as for Supraventricular Ectopic Beats
- (3) Wolff-Parkinson-White syndrome. Sometimes the tachycardia is a result of premature excitation of the ventricles via an accessory bundle of conducting tissue (Dundel of Kent).

E.C.G.: ATRIAL TACHYCARDIA

- (1) Pattern of repeated atrial ectopic beats but as the rate is fast the P waves may be hidden by the previous QRS complex
- (2) ST segment depression

AV NODAL TACHYCARDIA

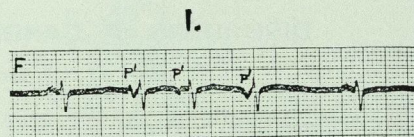
- (1) Pattern of repeated nodal ectopic beats with inserted P waves, following the QRS complexes

WOLFF-PARKINSON-WHITE SYNDROME:

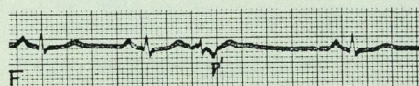
Short PR interval and wide complexes due to slowing of the first part of the QRS complexes ("delta wave"). This is the result of accelerated conduction via the anomalous conducting material.

TREATMENT: Termination of the attacks can usually be achieved by some trick which increases vagal tone, such as bilateral pressure on the eyeballs, carotid sinus massage, or the Valsalva manoeuvre. Failing this, IV Propranolol may be used to terminate the attack, and continued orally as prophylaxis if attacks are frequent. Digoxin or DC shock may also be used.

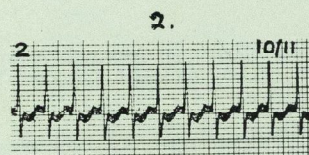
ATRIAL FLUTTER: An ectopic focus fires off regularly at about 300 p.m. At this rate the ventricles are normally unable to respond to each beat and so beat at a half or quarter of the atrial rate. The tachycardia may lead to Angina and Cardiac Failure.



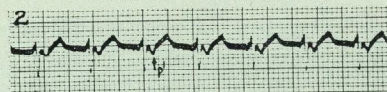
ATRIAL ECTOPIC BEATS



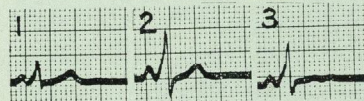
AV NODAL ECTOPIC BEAT



ATRIAL TACHYCARDIA



AV NODAL TACHYCARDIA



W-P-W SYNDROME

CAUSES:

- (1) 90% have underlying heart disease commonly: Infarction; Rheumatic or thyrotoxic heart disease; ASD; Constrictive pericarditis; Alcoholic cardiomyopathy
- (2) Rarely occurs in healthy individuals.

E.C.G.:

- (1) Regular QRS complexes
- (2) 'Saw-tooth' baseline of identical flutter waves.

TREATMENT:

- (1) Digitalis. This usually shows the ventricular rate and may convert to atrial fibrillation
- (2) Quinidine may also be tried, but only after moderate digitalisation
- (3) DC countershock is very effective, and is the method of choice.

ATRIAL FIBRILLATION (AF) Multiple ectopic foci in the atria fire off around 600 times p.m. The atria respond irregularly and only a proportion of the impulses reach the ventricles. The pulse is rapid and completely irregular.

CAUSES:

- (1) Heart disease present. Commonly in rheumatic mitral valve disease, ischaemic heart disease and thyrotoxic heart disease. Less commonly after thoracotomy, in ASD, cardiomyopathy or from metastases in carcinoma of the bronchus
- (2) No heart disease present "Lone Atrial Fibrillation" can occur for no apparent reason and is compatible with a normal lifespan.

E.C.G.:

- (1) P waves absent
- (2) Irregular undulations of baseline: "f" waves
- (3) Normal QRS complexes, irregular in time.

TREATMENT OF AF DIGOXIN is given to slow the heart rate and to maintain adequate cardiac output.

REVERSION TO SINUS RHYTHM. Attempts at reversion are doomed to failure if the underlying cause is not recognised and dealt with. With this proviso, DC shock synchronised with the R wave is the treatment of choice, and has replaced Quinidine.

(3) VENTRICULAR ARRHYTHMIAS

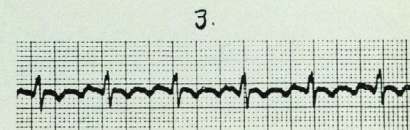
VENTRICULAR ECTOPIC BEATS: An ectopic focus in the ventricles discharges causing a premature heart beat followed by compensatory pause. When every other beat is a premature beat, Bigeminal rhythm, or "Coupling" is said to occur; this often occurs in Digitalis overdose.

CAUSES:

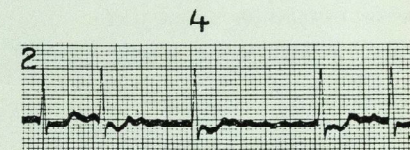
- (1) Common in a normal heart. Aggravated by excesses of Coffee, smoking, alcohol or la dolce vita generally
- (2) Digitalis overdose, commonly as "Coupling"
- (3) Following infarction when this may herald a more sinister arrhythmia.

TREATMENT:

- (1) None for the occasional ectopic beat
- (2) If due to Digitalis stop the drug and give oral potassium
- (3) If frequent, give I.V. Lignocaine or oral Quinidine.



ATRIAL FLUTTER



ATRIAL FIBRILLATION



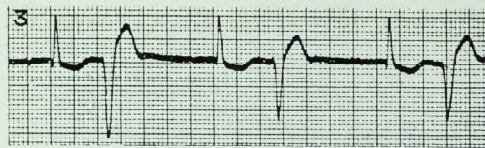
VENTRICULAR TACHYCARDIA: A run of ventricular ectopic beats. The rate is regular and around 150-200 p.m.

CAUSES: Usually due to advanced disease of ventricular muscle, particularly after infarction or severe Digitalis overdose. Subsequent anoxia may lead to ventricular fibrillation unless the tachycardia is controlled.

TREATMENT: DC shock is the treatment of choice. This may be followed by I.V. Lignocaine or Procainamide, or oral Quinidine to prevent recurrence.

VENTRICULAR FIBRILLATION (VF) Irregular and uncoordinated contraction of ventricular muscle fibres. Cardiac output is nil! It may or may not be preceded by ventricular ectopics or tachycardia.

CAUSES: Often a terminal event in acute infarction, but also occurs in aortic stenosis, complete heart block, suffocation and electrocution, as well as in drug overdose.



COUPLED VENTRICULAR ECTOPIC BEATS



VENTRICULAR TACHYCARDIA



VENTRICULAR FIBRILLATION

ROUGH OUTLINE OF TREATMENT

- (1) Establish ventilation and cardiac massage within three minutes to prevent irreversible brain damage
- (2) Defibrillate as soon as possible, with a DC shock
- (3) Correct metabolic acidosis with a drip of sodium bicarbonate; severe acidosis may foil attempts to defibrillate
- (4) If there is a tendency to relapse into VF, intravenous Propranolol may help.

E.C.G. VENTRICULAR ECTOPIC BEATS generally stick out like a sore thumb!

- Note* (1) Bizarre premature QRST complex with wide QRS, and ST segment sloping away from the main QRS deflection
- (2) Full compensatory pause
 - (3) P wave usually lost

VENTRICULAR TACHYCARDIA:

- (1) Run of regular but bizarre QRS complexes.
- (2) P waves from the independently beating atria may be seen as here.

VENTRICULAR FIBRILLATION:

Completely irregular electrical activity from the ventricular.

HEART BLOCK

Arrhythmias may also be produced where there is a disorder of conduction along the Bundle of His—"Heart Block".

There are four grades of severity:

1ST DEGREE H.B.—Prolonged PR interval.

THE WENCKEBACH PHENOMENON

Dropped beats

FIXED ATRIOVENTRICULAR RELATIONSHIP

3RD DEGREE H.B.—Complete atrioventricular dissociation.

1ST DEGREE HEART BLOCK: This is purely an E.C.G. diagnosis. The PR interval exceeds the normal upper limit of 0.22 seconds. It may be transient, or develop into a higher grade of block: 1st Degree heart block is frequently the result of active carditis, particularly in rheumatic fever, but also occurs in chronic ischaemic, rheumatic or syphilitic heart disease and in ankylosing spondylitis with aortic regurgitation.

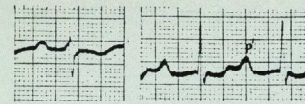
THE WENCKEBACH PHENOMENON: The PR interval gets longer and longer, and finally no QRS complex follows the P wave—a beat is dropped. Now the cycle starts again.

FIXED AV RELATIONSHIP: The ventricles respond to a fixed proportion of the atrial impulses; the others are blocked in the Bundle of His. This type usually progresses to third degree heart block, and is particularly common in ischaemic heart disease.

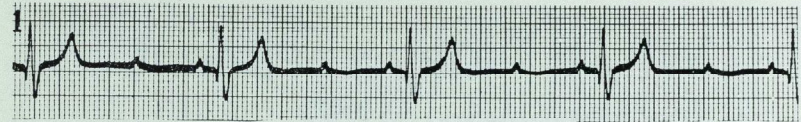
3RD DEGREE HEART BLOCK: The atria and ventricles beat independently at their intrinsic rates, no conduction occurring along the bundle. The heart rate is slow, usually about 25–35 p.m. and there are symptoms of low cardiac output. Attacks of fainting occur in about half of patients with complete heart block due to periods of ventricular arrest or VF (Stokes-Adams attacks). The patient usually recovers in a few seconds, occasionally after convulsions, but the attack may be fatal.

CAUSES:

- (1) Idiopathic fibrosis of the bundle
- (2) Congenital heart block
- (3) Diphtheritic carditis
- (4) Digitalis overdose



1st DEGREE HEART BLOCK

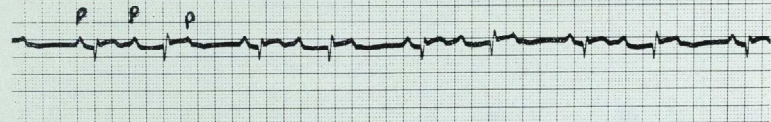


2nd DEGREE HEART BLOCK; FIXED AV RELATIONSHIP TYPE.



3rd DEGREE HEART BLOCK

7: WENCKEBACH TYPE OF 2nd DEGREE HEART BLOCK IN A PATIENT WITH ACUTE MYOCARDIAL INFARCTION.



- (5) Chronic ischaemic, rheumatic or syphilitic heart disease
- (6) Haemorrhage into the bundle from trauma or asphyxia.

E.C.G. FIRST DEGREE HEART BLOCK—Prolonged PR interval.

WENCKEBACH PHENOMENON—Increasing PR intervals until a beat is dropped.

FIXED AV RELATIONSHIP—A fixed number of P waves occur before a QRS complex is initiated.

3RD DEGREE HEART BLOCK—The P waves are an equal distance apart and so are the QRS complexes, but they bear no fixed relationship to each other; in the E.C.G. above the atrial rate is 96 and the ventricular rate and pulse 28.

TREATMENT OF COMPLETE HEART BLOCK

- (1) Sympathomimetic drugs to increase the ventricular rate—Saventrine: long-acting isoprenaline: is the drug of choice.
- (2) Steroids sometimes help particularly when the cause is infarction.
- (3) If attacks are frequent, artificial pacemaking is indicated. There are three types.

EXTERNAL PACEMAKER: Two electrodes are placed far apart on the chest wall, and a 100 volt discharge is applied 60–80 times p.m. This method is only suitable for short periods under anaesthetic.

PACEMAKER CATHETER: A catheter with one pacemaker electrode on its tip is passed into the right ventricle so that it touches the wall. The other electrode is in contact with the skin. Only a few volts are needed for this method, but it is not suitable for long term pacing, because of the risk of infection.

PACEMAKER IMPLANT: At operation, electrodes are sewn onto the exterior of the ventricle, and connected to a pulse generator usually implanted under rectus abdominis. This is the treatment of choice for long term pacing and a nuclear powered version has just been announced.

The Author would like to thank Dr Hamer for his help in the preparation of this article, and Gill Philp for typing the manuscript....

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The Mechanism of Action of Antibiotics in Relation to Protein Synthesis

by Mike Horton

The work of Paul Ehrlich at the turn of the century gave rise to the science of chemotherapy, which was to invoke the co-operation of chemist, biologist and doctor in an attempt to produce compounds with which to combat infections due to bacteria, fungi and viruses. Ehrlich's studies of antitrypanosomes yielded the fundamental concept of later work, that of the target theory of drugs—the agent combining at first with a sensitive receptor in the pathogenic organism, with the vital damage following.

The nature of the receptor, in a physicochemical sense, was first studied when the antibacterial Penicillin became readily available in the early 1940's. Since then its mechanism of action has been elucidated, along with the other antibiotics which have been shown to interfere in some way with cell wall mucopeptide synthesis, eg Cycloserine, Bacitracin, Vancomycin, etc.

Theoretically the possible sites of drug sensitivity are very numerous, but they can be divided, for example, into the following groups:

- (1) At some stage of energy "generating" metabolism.
- (2) At some point in the coupling of oxidative phosphorylation and electron transport.
- (3) The permeability and integrity of the cell membrane as a physical barrier, or at some stage in its synthesis.
- (4) Interference with the synthesis and/or structure of nucleic acid and protein.

If the drug enters the parasite cell then it cannot act in the areas of metabolism common to both bacterium and host, as this will not account for the selective toxicity observed with certain antibiotics. However the same metabolic pathway in the two cells may have constituent enzymes with the same function but with a different molecular structure which confers sensitivity upon the molecule of one organism and not the other. Thus the range of different sensitive sites is much greater than initially apparent.

The ultimate object of the study of antibiotic action must be the design of compounds which will act at a predetermined and specific inhibitory site. This, in turn, depends upon a precise knowledge of the mechanism of action of that compound in chemical terms. The inhibitors of nucleic acid and polypeptide synthesis were originally only of great use to the biochemist studying the mechanism of these processes, but now with the greater understanding gained from this early work, potentially useful antibiotics are studied from a more fruitful approach, that of the definition of their sites of inhibition.

The drugs discussed in this article have been selected to illustrate inhibition at the more obvious sites of control of protein synthesis and not because they are necessarily particularly useful in

clinical practice. (See Fig. 1).

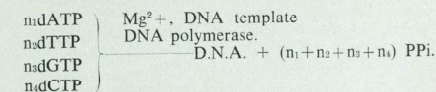
Summary of the Sites of Action of Certain Antibiotics

SITE OF ACTION	DRUG
Assembly of nucleotide substrates.	Psicofuranine.
Inhibition of D.N.A. replication.	Mitomycin.
Inhibition of R.N.A. transcription.	Actinomycin.
Amino-acid activation.	?
m.R.N.A.-Ribosome binding.	Chloramphenicol.
r.R.N.A.-Ribosome binding	Tetracyclines.
Translation of m.R.N.A.	Streptomycin.
Synthesis of the peptide bond.	Puromycin

INHIBITION OF NUCLEIC ACID SYNTHESIS.

Action of D.N.A. polymerase.

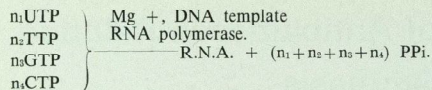
D.N.A. synthesis is catalysed by the enzyme D.N.A. dependent D.N.A. polymerase, which influences the polycondensation of deoxynucleoside triphosphates in accordance with the equation:



The base sequence of the synthesised D.N.A. corresponds to the sequence of the template, which is in a single stranded form. All antibiotics that alter R.N.A. synthesis by blocking D.N.A. by associating with it, also inhibit this reaction the concentration of base-specific inhibitors required to obtain a given effect on the D.N.A. synthesis being much greater than that required for the same effect on R.N.A. synthesis.

Action of R.N.A. polymerase.

The first step in transfer of genetic information to protein synthesis is the transcription of single stranded R.N.A. on a D.N.A. former in the double helical form, the base sequence of the product corresponding to that of the template:



The above reaction proceeds in several steps, the D.N.A. dependant R.N.A. polymerase enzyme, firstly, reversibly adding onto the nucleic acid, which may be single or double stranded. At the same time the duplex form undergoes an initial phase of local opening up of the secondary structure (i.e. "melting").

At the beginning of replication a relatively high concentration of purine nucleotides is necessary and a stable D.N.A.-Enzyme-Nucleotide complex is formed, on which a short R.N.A. segment may already be synthesised. On addition of the other nucleotides, R.N.A. synthesis proceeds with the liberation of pyrophosphates (PPi) and the concomitant SF. movement of the polymerase enzyme along the D.N.A. template, thus leading to the formation of the D.N.A. Enzyme-R.N.A. complex which dissociates under the stimulus of the subsequent protein synthesis.

Effects of antibiotics on nucleic acid synthesis.

1. Phenanthrenes eg Ethidium Bromide.

(See Fig. 2).

Anthracines eg Proflavine.

These two groups of antibiotics have been shown to bind to nucleic acid forming a spectrophotometrically distinct complex, which is dependant upon the presence of a helical secondary structure. For example there is little binding to polyUracil or polyAdenine, but there is greater than expected binding to the copolymer polyUracil+ polyAdenine.

Using natural or synthetic D.N.A., combination with ethidium bromide causes an increase in intrinsic viscosity, a decrease in sedimentation rate and loss of ordering of the molecule on X-ray diffraction, concomitant with an inhibition of D.N.A. dep R.N.A. polymerase catalysed R.N.A. synthesis.

Spectral studies of D.N.A./proflavine complexes have been interpreted by Lerman (1961), (See Fig. 3), to indicate the intercalation of the triplanar molecule of the drug between the adjacent base pairs of the double helix. This process would cause the observed increase in length, decrease in diameter of the molecule with a randomisation of the stacking of the bases in the helix. For proflavine, intercalation causes a decrease in helical rotation of base pairs of 12° per inserted molecule, with a twofold increase in base pair spacing.

2. Mitomycin C. (See Fig. 4).

Mitomycin, in its activated form (where the two quinone groups are converted to hydroxyl groups and the methoxy radical removed), inhibits D.N.A. synthesis and degrades it to soluble products; R.N.A. and protein synthesis, however, is temporarily unaffected.

The treated D.N.A. seems to function as cross-linked, thus acting as a poor primer for D.N.A. dep. D.N.A. polymerase and a good primer for R.N.A. synthesis. However cross linking may be a relatively rare event, the main reaction being monofunctional alkylation of D.N.A. Guanosine residues by the ethylenimine or $\text{CH}_2\text{OCONH}_2$ groups. Cross-link formation may, though, be affected by an excision-repair mechanism, in vivo results thus being misleadingly low. If cross-linking does occur then the event would be lethal due to the blocking of D.N.A. replication at mitosis, hence inhibiting cell division.

3. Actinomycin D. (See Fig. 5).

In contrast with mitomycin, actinomycin inhibits R.N.A. synthesis catalysed by D.N.A. dep. R.N.A. polymerase, whereas D.N.A. and protein formation temporarily continues. The blockage neither affects the binding of the polymerase enzyme to D.N.A. nor R.N.A. synthesis by R.N.A. dep. R.N.A. polymerase and thus seems to indicate that the drug interacts with D.N.A. itself, hence altering its primer activity. The complex so formed is displaced so strongly towards the associate that the antibiotic migrates together with the D.N.A. on ultracentrifugation, gel filtration and in an electric field.

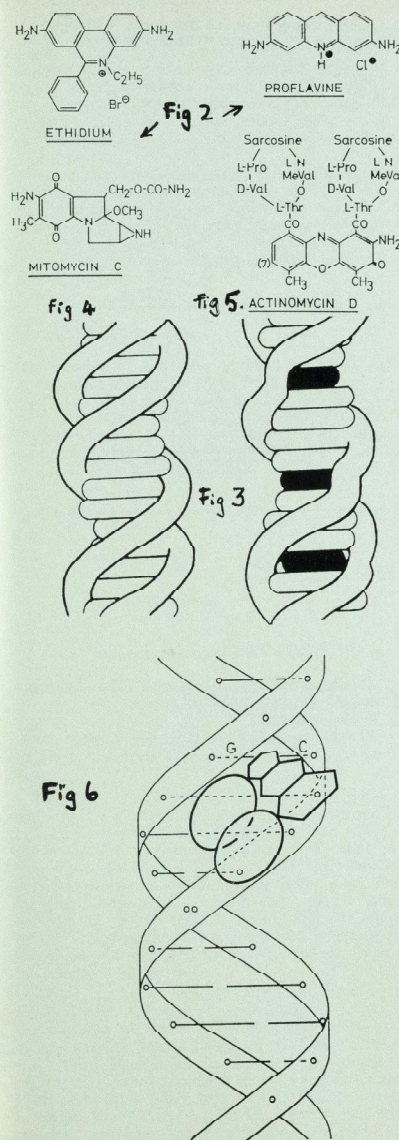
For actinomycin to react with the D.N.A. the nucleic acid must be double-stranded and have a high Guanosine content, the presence of the 2-amino purine residue being essential for the drug's antibiotic activity. Synthetic copolymers of dGuanosine + dCytosine will associate with this drug, as will free Guanosine, but in vivo the adjacent base sequence of the native nucleic acid may alter the binding characteristics quite markedly.

Fig. 6 is a schematic representation of the D.N.A.-actinomycin complex in which the amino and quinone groups of the triple ring system hydrogen bond with the 2-amino and N-3 regions of the purine and the ring oxygen of the deoxyribose. The two cyclic peptides fit into the narrow groove of the D.N.A. and bond to the phosphate oxygen atoms in the opposite strand to that containing the dGuanosine. However this model is only theoretical and the drug may intercalate in a similar fashion to proflavine.

Comparison of the action of mitomycin and actinomycin

Mitomycin and actinomycin both act as complements to the natural structure of D.N.A., the position of D.N.A. in the cell making it particularly vulnerable, since one successful disturbance of D.N.A. metabolism may be lethal to the cell, as there is only one copy of each gene per cell.

The different actions of the two drugs may be a direct result of the presentation of the D.N.A. to the polymerase enzyme. Mitomycin inhibits D.N.A. polymerase as this enzyme is located on the wide groove of the D.N.A. and acts as a catalyst when the two strands are separated, whereas actinomycin inhibits the enzyme R.N.A. polymerase, which is positioned on the narrow groove and tends to utilise D.N.A. in its duplex form.



INHIBITION OF PROTEIN SYNTHESIS

The course of protein synthesis, (in the cell free system from E.coli.). (See Fig. 7).

The complete course of events during the synthesis of a polypeptide chain at a ribosome is not fully characterised but the basic steps in the process are quite well understood.

The activated acyl r.R.N.A., N-formylmethionyl-r.R.N.A., acts as the initiator of the sequence of steps in peptide bond synthesis by binding to the initiator site on the 30 S ribosomal subparticle, which is previously complexed with R.N.A. The reaction is enzyme catalysed and GTP acts as an essential cofactor; the initiation factors F_1 and F_2 must also be present.

For peptide bond formation to continue the 50 S subparticle must be associated forming the complete 70 S ribosome (which has been shown in studies with Puromycin in the synthesis of Formylmethionyl Puromycin). Prior to the transfer of an activated amino acid residue to the amino acid donation site (Site A), Formylmethionyl r.R.N.A. is moved to the polypeptide binding site (Site P). Under the direction of the m.R.N.A., the first aminoacyl-r.R.N.A. molecule is bound to Site A, providing the transfer factor G and GTP are present, and the peptide bond is synthesised. This bond joins the N-terminal formylmethionyl residue to the aminoacyl-r.R.N.A. with the R.N.A., directed by the first m.R.N.A. codon, being released. This reaction is catalysed by the peptidyl transferase enzyme which is localised on the 50 S ribosomal subparticle.

Finally, relocation of the polypeptidyl-r.R.N.A. molecule to Site P occurs, with concomitant movement of m.R.N.A. to the next codon, under the influence of the essential supernatant factor I and GTP acting as an energy donor.

(1) Chloramphenicol. (See Fig. 8).

The binding of the L-isomer of the antibiotic chloramphenicol to ribosomes is species specific, the drug associating with the 50 S subparticle of bacteria and hence only inhibiting protein synthesis on the 70 S ribosome and not the 80 S ribosome of yeasts and mammalian cells. Peptide synthesis, directed by a polyUracil messenger, is inhibited by competition for the m.R.N.A. binding site, the drug requiring potassium ions for interaction with the 50 S subparticle.

The selectivity of action may not be only a function of ribosomal structure, but also of the half-life of

Fig. 2: Ethidium. Proflavine.
 Fig. 3: Normal D.N.A. and DNA intercalated with Proflavine (right). Base pairs and Proflavine appears in edgewise projection and the phosphate-deoxyribose backbone as a smooth coil.
 Fig. 4: Mitomycin C.
 Fig. 5: Actinomycin D.
 Fig. 6.: Schematic Representation of the possible Actinomycin-D.N.A. complex.

the mRNA molecules, being much greater in mammals than in bacteria.

(2) Streptomycin. (See Fig. 9).

In sensitive bacteria, at adequate antibiotic concentrations, there is not only an inhibition of protein synthesis by streptomycin but also a significant increase in errors of mRNA translation. In vitro, using a synthetic messenger of alternating nucleotides of UMP and GMP, there is inhibition of correct synthesis with a concomitant stimulation of incorrect synthesis (i.e. misreading), thus resulting in the incorporation of Arginine and Serine into the polypeptide being formed, which should only consist of Cysteine and Valine.

The misreading, described with artificial homopoly-peptide messengers, may well be artifactual and under physiological conditions, where initiation of peptide synthesis is more rigorously controlled, a separate inhibitory process directed against Site A may predominate. Recent work suggests that distortion of Site A by streptomycin, impairs the binding of aminoacyl-tRNA, thus delaying polypeptide transfer after peptide synthesis, which in turn causes premature peptide release with ribosomal dissociation and polysome degeneration.

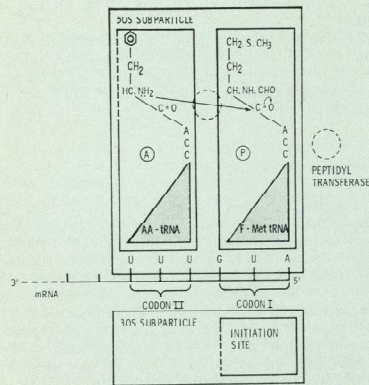
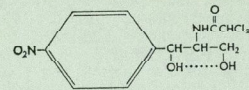
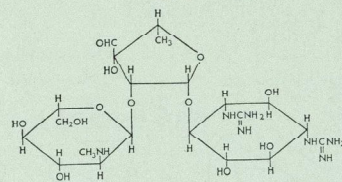


Fig. 7: Diag. of the structure of a 70 S ribosome from E. coli.

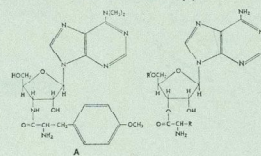
Chloramphenicol, showing the hydrogen bond between the two hydroxyl groups



Streptomycin



The structural resemblance between puromycin (A) and the terminal amino-acyl adenosine of t-RNA (B)



R: side chain of amino acid
R': remainder of t-RNA molecule (Feldman & Zachau, 1964)

Fig. 8: Chloramphenicol, showing the hydrogen bond between the two hydroxyl groups.

Fig. 9: Streptomycin.
Fig. 10: The structural resemblance between puromycin (A) and the terminal aminoacyl adenosine of t-RNA.

(3) Puromycin. (See Fig. 10).

The addition of puromycin to protein synthesising media leads to inhibition of peptide bond formation, polysomal disintegration and liberation of peptide fragments occurring after a short delay. The antibiotic is released from its binding site on the ribosome, linked by an amide bond between the amino group of its L^o methyl Tyrosine residue and the carboxyl end of the peptide.

Puromycin seems to act on Site A of the ribosome as an inactive analogue of an aminoacyl-tRNA, completely inhibiting peptidyl transferase and abolishing subsequent stages of synthesis, thus causing premature polypeptide release. This is understandable in view of the structural resemblance of puromycin to the terminal part of an aminoacyl-tRNA.

Recommended Reading

- (1) Antibiotics and the genetic code. L. Gorrini. Scientific American. 214 (1966) p. 102.
- (2) Antibiotics, proteins and nucleic acids. J. F. Collins. Brit. Med. Bull. 21 (1965) p. 223.
- (3) Biochemical Studies of Antimicrobial Drugs. ed. R. A. Newton and P. E. Reynolds, Cambridge Univ. Press (1966).

References

- (1) Antibiotics as inhibitors of nucleic acid and protein synthesis. G. Hartmann et al. Angew. Chem.internat.Edit. 7 (1968) p. 693.
- (2) Base specificity in interaction of polynucleotides with antibiotic drugs. D. C. Ward et al. Science. 149 (1968) p. 1259.
- (3) Drugs which affect the structure and function of DNA. M. J. Waring. Nature. 219 (1968) p. 1320.
- (4) Mechanisms of inhibition of ribosomes by Streptomycin. J. Modolell et al. Nature. 221 (1969) p. 345.
- (5) Molecular mechanisms of antibiotic action. W. Carter et al. Annals of Internal Med. 64 (1966) p. 1087.

A Recent Reference on the Mechanism of Action of Streptomycin: Strigini and Gorini. J. Mol Biol. 47 (1970) p. 517

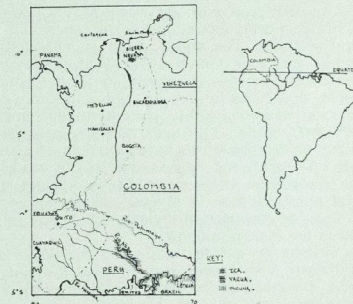
South American Indians

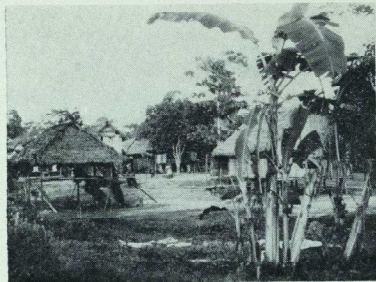
By David Gundry

While on the Amazon during the summer of 1968, we came into contact with three distinct Indian tribes. The months on the Amazon furnished two of these, the TUCUNA and YAGUA, while we met the other ICA people in the Sierra Nevada de Santa Marta to the North.

The Tucuna are a large tribe which populates the main river for several hundred miles above and below Leticia. We visited three Tucuna villages which bore the marks of tourism to a greater or lesser extent. The most genuine of these was Arrara, situated on a tributary of the Amazon four hours boat journey up river. Approaching in the early part of the dry season, the mirror surface of the water is shattered by one's passage, reflected clouds sent bobbing in the wake and parrots screaming into the air from their lofty perches on the trees.

Arrara, set in a clearing away from the river bank closely resembles the villages described in the grey anthropology textbooks. It is composed of about thirty square wooden houses raised on stilts above the flood water level. Each house has a single partitioned sleeping room, a small kitchen where the fire is kindled in a shallow sand filled trough and a large unwallled verandah where finely woven hammocks hang limp in the sultry air. The roof, composed of intricately woven palm leaves is a work of art in itself, hardly rivalled





Arara



Arara

in delicacy by other productions of ritual masks, baskets, paddles, carved animals and bark-cloth clothes.

The Tucuna have broad faces and prominent cheek bones. Their hair is straight and charcoal black as are their eyes. They tend to dress these days in cheap store clothes, the traditional tutury bark-cloth being kept for feast days and ceremonial occasions. They are quiet practical people, individualist by nature and tend, one is told to be volatile and aggressive when drunk. Their culture is unsophisticated. Agriculture is carried on at subsistence level, to augment a diet of fish, which are caught by the use of harpoons and Timbó poisons. The small amount of meat that is consumed is obtained by hunting monkeys, peccary, ant-caters and tapir, with the odd parrot and toucan thrown in for good measure. They still use bows and blow-guns and arrows tipped with Curare which they get in exchange for canoes from the Yaguas.

The Tucuna have an interesting religion and spiritual shamans who function as priests and doctors. In addition to the here and now, they believe in an uproar and a lower world, located below the stars and the earth respectively. The upper world is inhabited by indian-like men, the Goddess Tae, and the soul of the deceased. The soul is thought to leave the body soon after death and to pass through a two way gate of judgment where evil spirits are barred and returned to the lower world. The underworld is predictably inhabited by demons which have a variety of anthropomorphic shapes, and appear disguised in masks at Chicha (yuca-beer) celebrations. The most important of these numerous Napi is Dyerac, the master of the fishes, who has the shape of a giant Siluride and shows himself in the eastern rainbow.

The shaman or spiritual man gains his power and magical darts from communication with the napi of the trees. By means of tobacco and other intoxicants this man maintains his contact with the demons, and may use his thorns to produce disease in any person whom he may wish to harm. The victim will die a horrible death, and descend to the lower world unless another shaman can be found to remove the thorns.

Since their first contact with European traders in the C18th, the Indians, with very good reason, have been mistrustful of white people. This mistrust shows

itself in their religion in two ways. Firstly, they may kill any child of a Neo Brazilian parent and go unpunished by Taé. Secondly, they believe that they have offended Dyai, their Creator by compromising with the invaders and corrupting their ancient spiritual culture. They will therefore suffer a cataclysm which can only be avoided by congregating in a certain place which will be indicated to them through the mouth-piece of a child. This so called primitive belief has certain striking parallels with that of a modern group which meets on Mont Blanc from time to time in order to avoid the next flood!

Many South American Indians have initiation ceremonies for the male and female children, and the Tucuna are no exception. As H. W. Bates writes in his "Naturalist on the River Amazonas": "The Tucunas have a singular custom, in common with the Collimas and Manhés, of treating young girls on their showing the first signs of womanhood as if they had committed some crime." Bates is referring to the hair-pulling ceremony of female initiation which we were able to witness in the village of Mariaçu.

The girl is thought to be especially susceptible to the influences of evil spirits at this time, and is therefore secluded for several months prior to the event, in a small room decorated with emblems of the sun, moon, morning star and deer (the symbol of vigilance). Great quantities of chicha are brewed in readiness for the period of debauchery. During the first day of the ceremony the girl is largely ignored as the men of the village, dressed in bark-cloth clothes, genipa paint, and goulish zoomorphic masks, in order to satisfy the spirits of their ancestors, drink and dance to the simple repetitive rhythm of a drum and trumpets. Towards sunset the girl is dressed in streamers of royal sparrow hawk plumage, a long macaw feather diadem, feather amulets, white tutury fringes, bone clappers and ear-pigs, and brought out to watch the suggestive covertings of the men.

Towards the evening of the second day, the more traumatic part of the ceremony is enacted. The unfortunate girl is carried into the large communal hall or Malocca which has been built for such occasions and is placed on a Tapir skin in the midst of the travelling throng. Thereupon three females set upon her and proceed to pull out by the roots every hair in her



Monkey



An Indian family

head. In this degradingly bald state she is borne off to the river to be washed by the magic men while the shaman chants continually to give protection against the water demons. She is now considered to be fit for marriage although in an eminently unattractive condition. Many of the Indian rituals can be shown to have a sound practical or psychological basis, but what this could be in the ceremony of the hair-pulling escapes me.

In Arrara we were able to see the Tucuna living much as they have done for the last fifty or one hundred years. In Mariaçu, which is very much on the tourist round, this is sadly far from the case. Here tourists are not greeted openly as guests, but accepted as a diversion in the monotony of their everyday life, and a reliable source of cigarettes. As a party of camera clicking, cigar-puffing Americans are led through the village, the majority of Indians peer disinterestedly from the security of their houses, sullenly accepting the proffered cigarettes, as monkeys would bananas in a zoo. The children are more forthcoming and respond with well-timed giggles to the endless "arn't they cute!" of the enthralled visitors. Many of these little urchins carry the protuberant belly of malnutrition due more to the parasitic infections than to lack of protein which is in abundant supply in the river. The Mariaçu Indians have grown lazy in their hunting and fishing since they can make such an easy living from the tourists. They have learnt that any old trash will make them as much money as a week's work in Leticia, since the visitors just want something to show the folks back home, and the more primitive the more it boosts their egos. It is only too easy to see that the high standards of individual and corporate integrity which we saw in Arrara have only been maintained in the absence of tourist pressures.

The Yagua

The Yagua Indians live many hours up river above Puerto Nariño. The villages are off the main river on small tributaries and can only be approached with difficulty. The two families which we visited had separated from their village and now lived on the main river not far from a Tucuna settlement. These were

not representative of the tribe as a whole as the dreaded scourge of tourism had reached and infected them.

These families lived in mean huts composed of sticks driven into the mud to support a rough covering of grass which served as an inadequate roof. In the other villages, up to ten related families live in the huge communal maloccas. These communities are said to be models of democracy, each adult enjoying strict equality with all others except for an elected chief and a council of elders.

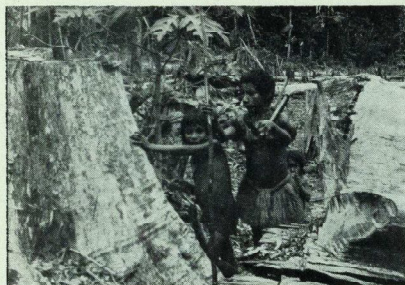
Physically the Yagua are not very different from the Tucuna, barring a certain coarsening of the features. They wear a kind of skirt, with knee, arm and neck bands made of orange dyed grass. In addition the men have neck-bands of human and jaguar teeth which bear witness to bravery.

The Yaguan mythology is simpler than that of the Tucuna, and the shaman has a similar proprietary and vindictive role. Initiation ceremonies are unremarkable as the girl is allowed to progress to sexual maturity with the minimum of fuss.

One wonders what the fate of these people will be, continually exposed to the overt materialism and gifts of the tourist train, which rather than diminishing will swell with time, their incentive for action is inappropriate to the environment in which they must continue to live. They will inevitably pick up values which are even more out of place on the Amazon than they are in Miami, Manhattan or Manchester. They cannot fail to lose their sense of identity with the community which will fragment. Without gaining a new cohesive force their priorities will become warped and prostituted to those of western civilisation, and their reality removed from the natural situation on the Amazon. Their future appears to me to be a dim one.

The Ica

We left the Amazon in late August and travelled back to Bogota, from whence we moved to the north Caribbean coast, spending some time in haciendas on the way. During this journey we were made more aware of the social conditions of the country, and the feudal stratified society than of further Indian groups. After several days on the Caribbean coast



Children in Arara

where the Negro influence is very strong, we moved back to the Sierra Nevada de Santa Marta.

The Sierra Nevada is a small, isolated group of mountains bordering the Caribbean, which is geologically distinct from the Cordilleras of the Andes. Stretching up to nearly 17,000 feet in Pico Cristobal Colon, the range is composed of high level valleys and steep sided ridges is inhabited by the Arhuaco Indians. This generic term covers several Chibchan speaking tribes of which the Buntigwa, Sanha, Ica and Tairona of the coastal plain are well documented. We spent a few days with the Ica at their main village of San Sebastian.

The impact of civilization was first felt by the coastal Taurona, following the foundation of Santa Marta in 1525. On account of their remote surroundings and their independent temperament the Ica remain remarkably unaffected.

To reach San Sebastian the traveller must take the road from the scorching plains at Valledupar, walking or riding in a jeep as austerity demands, to come to Pueblo Bello, a small settlement of farmers. Here he takes a mule and walks the twenty odd miles to San Sebastian traversing two ridges on the way. This we did, and winding up the bright orange sandstone road we came across Ica Indians in increasing numbers. They appeared like ghosts, long white woollen robes falling to their ankles. Their faces are aquiline, the skin of a dark burnished hue, dominated by fierce black eyes and framed with long black hair. The men wear rough white caps of the same material as their clothes, high domed, these are said by some anthropologists to have phallic symbolism. Over their shoulders the men carry mochilas, woollen bags gaily woven in red and black geometric patterns (not unlike some aztec motifs) which contain their greatly prized Coca.

In contrast to the men, the women carry themselves humbly, and are treated in much the same way as the oxen they tend. Families we passed on the road might be composed of the man riding in state on a horse or a mule, while the woman and one or two children would struggle along under huge loads.

The Ica village has a neat but dead appearance. Small square houses are built in an invariable grid pattern, the paths in between kept meticulously clean. The houses themselves are square and constructed of

mud, wattle and straw on a base of large river worn stones, the whole being covered with a rough grass roof. In the centre of the village there is a square but the people, taciturn by nature, tend to keep to themselves. Women sit in small shy groups of two or three quietly whispering to each other as they spin thread. The men float between the houses taking little notice of their surroundings. From time to time they stop and with a small stick they mix Coca leaves with lime, twisting it into a plug which is pushed into the corner of the mouth with a thumb.

The Ica practise simple subsistence agriculture, only taking real care over the cultivation of Cocoa and the Agave fibre plant. They subsidize this diet with fish harpooned in the surging torrents, domestic and captured animals among which the armadillo is highly rated. Tobacco is not smoked, but boiled to a black tarry mass and rubbed into the gums to supplement Coca.



Have a light?

Their social organisation is practical in the extreme. Within the family, authority is placed entirely in the hands of the father, while beyond the family the shaman, priest or Mama holds sway. The Mama is a highly respected person who must go through a nine year period of training with total abstinence from salt in order to gain knowledge of the beneficent and malignant spirits. The esoteric knowledge of the Mamas involves the understanding of the ritual dances and songs which are performed in the Casuamaria for the propitiation of the spirits of sickness and death. It follows from this that disease is considered to be intrusive as the spirits enter the body to produce suffering.

Christianity has had little effect on the Ica, although the children are taught at the mission. They believe in the magnificent Gauteovan, mother of all things who created the sun out of her menstrual blood. Aluna is the mystical abstract force or spirit of magic, thought, feeling, intention and dreams which acts through the agency of Coca.

A certain reticence seems to exist between the men and the women, the former living almost exclusively on the Coca maintain a mystical brotherhood,

reminiscent of organisations in this country. We did not hear of women taking Coca. The drug one is told, not only reduces the pangs of hunger, but also the sexual appetite, a fact borne out by the dearth of small children, a situation very different from that on the Amazon and the Cordilleras where a rigorous family planning campaign is just beginning in an attempt to rectify the imbalance produced by medicine. These people seem to have discovered a very agreeable form of male contraceptive, although it is unlikely to appeal to our government!

One feels that for the Ica Indians life can have changed very little during the last few hundred years. It is good to see that they retain a strong feeling of their own identity and have not bastardised their

simple culture in eagerly grabbing the worst elements of western "civilisation," as have many other unsophisticated people where commercialism marched ahead of real education. One hopes that they are safe in their mountain fastness for a few more years.

We could have only a few days in which to explore the nearer valleys of the Sierra Nevada, before taking the sandy road back to the teeming towns. It was with regret that we turned our backs on the white snow capped peaks, sorry to have only three days and not three months or three years in which to try to understand these strange and unsophisticated people.

REVIEWS

TEXTBOOKS

Elementary Calculations in Biochemistry and Physiology by J. A. Barclay and K. White. J. and A Church Ltd., 20/-, 88 + viii pp.

Barclay and White are by no means alone in the discovery that "... some students of biochemistry and physiology, on leaving school, leave behind also the ability to perform even elementary calculations", and that "... an attempt to validate a concept or verify a hypothesis by recourse to a simple calculation ... sets up a mental block for the student." This little booklet sets out, in a very well thought out manner, to rectify this situation. It is clear and concise; typical calculations are worked through in a logical stepwise manner, with each step adequately explained. It is a book full of sound common sense, with no frills. It does not attempt to deal with statistics, except in connection with errors of observation and the reliability of individual results, but it does deal, very convincingly, with those old bugbears of measurements of composition and dilution of solutions, pH as a log scale—not detailed calculations of the pH of various types of solution), equilibrium constants, the use of calibration curves, osmotic phenomena, respiration, and electrolyte and water balance.

Whether students will ever be sufficiently convinced of their need for a book of this type to spend 20/- on it is however rather doubtful.

In view of the excellent way in which the book as a whole is conceived it is unfortunate that it contains an unforgivably large number of errors and misprints, many of them making nonsense of the calculation in which they occur. The student for whom this book is written will not find it easy to follow when a minus sign is lost in a calculation but reappears later on (a fault he is very prone to make himself), when a whole term is missing from one line of a calculation but has been used in deriving the next, when power developed appears to have acquired a large calorie in its dimensions which should never have been there, and worst

of all, when an inability to subtract 0.040 from 0.398 leads to the startling conclusion that a difference of 1 in the pH corresponds to a difference in the magnitude of the hydrogen ion concentration of *approximately* ten!

There are also several errors of fact which are rather unfortunate. The gas equation $PV=RT$ appears to apply to any quantity of gas; osmotic pressure is confused with the pressure required to prevent osmosis, and the chapter on electrode potentials had been better unwritten. The absolute and indeterminate value of a metal/metal ion electrode potential, the E.M.F. of a concentration cell involving two similar electrodes at different ionic concentrations, the value of an electrode potential relative to a standard electrode, and the standard electrode potential E_0 , have all got themselves into such a muddle that no student could possibly benefit from reading it.

In spite of all this, except for this one chapter, it is a very useful book, and I look forward to seeing at least a dozen corrections, and one completely new chapter, in the second edition.

G. E. FRANCIS.

Clinical Aspects of Autonomic Pharmacology, by Paul Turner.

Heinemann, pp. 169

Price 32/-

Our understanding of the function of the autonomic nervous system has increased rapidly in recent years. This new knowledge has been accompanied by the introduction of compounds which can influence neuro-transmission at autonomic ganglia and others which have increasingly specific actions as receptor blocking agents. Such developments are of immense importance not only to academic pharmacologists but also to practising clinicians, for the number of potent and useful drugs acting on the autonomic system increases almost daily.

The first half of Dr. Turner's book provides an outline of the function of the autonomic system, and of the

actions of parasympathomimetic, sympathomimetic, and blocking drugs. This concise account of autonomic pharmacology is especially valuable, and in it the author has been able to draw extensively on his own work in the field. The second part of the book deals with autonomic activity in health, and autonomic activity and blockade in disease. Although this wider topic perhaps lends itself less well to brief and authoritative discussion, the presentation remains clear throughout.

This book satisfies a real need for the undergraduate student. It is well produced and moderately priced.

D. Chamberlain

Neonatal Surgery by P. P. Rickham and J. H. Johnston, London. Butterworths, 1969. xiv, 633 pp. £8 10s.

Mr. Rickham and Mr. Johnston have provided in their book an authoritative guide to surgery in the newly born based on their experience with over 3,000 children treated in the neonatal surgical unit at Alder Hey Hospital in Liverpool.

In many parts of the country paediatric surgery has yet to develop fully as a speciality in its own right. The testimony to the wisdom of caring for neonates in special units is demonstrated throughout the book by statistics of the results achieved. Nowhere is this better revealed than in the figures for the results of pyloromyotomy for hypertrophic pyloric stenosis which record the treatment of 403 cases without a death for a condition which in the early 1940's had an operative mortality of 25%.

Throughout the book clear practical guidance is given on all surgical problems likely to be met by a surgeon called upon to treat neonates. The advice to the surgeon is supplemented by chapters on anaesthesia, nursing care and the ethical problems involved in treating the newborn.

The only criticism may be levelled at the quality of some of the illustrations. The photographs detailing the steps of spina bifida repair compare unfavourably as a method of instruction with artists' drawing such as those demonstrating the operative management of diaphragmatic hernia.

This book can be counted as an indispensable addition to the library of any surgeon dealing with children.

M. H. IRVING.

Psychology for Nurses by A. Altschul. Nurses' Aids Series 12/6d.

Miss Altschul is one of the leading authorities on Psychiatric Nursing and Psychology as applied to Nursing, and her new edition of Psychology for Nurses continues her same high standard.

The amount of information contained within this new edition covers approximately thirty pages. This increase is achieved by the extension and clarification of certain sections, rather than the inclusion of any new material. The number of examples and clinical illustrations have also been increased to clarify the appropriate text.

The basic layout of the book remains unchanged, and covers topics such as Psychology and the Nurse, Psychology and the Patient and Psychology and the Hospital. It is extremely difficult to single out any particular section of this new edition.

The whole book is outstandingly clear and simple, but dynamic in its approach to Psychology for Nurses.

Student nurses will surely find this book invaluable. The inclusion of suggested reading material at the end of each chapter allows the nurse to further her studies constructively.

A. P. SMITH

NON-MEDICAL

The Rose of Tibet. Lionel Davidson. Penguin Books, 5/-.

The central character of this compelling and exciting story is the art teacher of a girls' secondary school in London, Charles Houston. Houston smuggles himself into Tibet to search for his brother, convinced he is alive despite the fact that he has been reported dead by the Tibetan authorities. From India, Houston and his guide penetrate the mountains to reach Yamdring, a monastery of nuns, where he believes his brother to be held captive. Here, to his horror and surprise, he is hailed as the reincarnation of a former Chinese invader.

This is a story full of adventure of every kind; the frustrations and tensions to which Houston is subjected, not to mention the threat of the Chinese invasion, are guaranteed to keep the reader in suspense; it often takes a real effort not to skip the next few lines or pages in an effort to discover more quickly the outcome of a particular episode. This is not to say that the book is slow, but Mr. Davidson does occasionally show a tendency to dwell on seemingly unimportant technical detail. The narrative however, is interwoven with intriguing bits of information about the religious beliefs and superstitions of the Tibetans, and of their immense importance in the Tibetan attitude to world affairs.

Is it true? Could this really have happened? Written with a traveller's view of the East, this book certainly has the ring of truth about it. Don't be discouraged by the first page of the Prologue, it contributes a great deal to the whole.

D. J. LUCAS.

A Dying Colonialism. Franz Fanon. Pelican. 4/-.

Franz Fanon was a psychiatrist working in an Algerian hospital at the time of the 1956 revolution. Although born in Martinique and medically qualified in France, his sympathies lay with the Algerian rebels and he became one of their most eloquent leaders against the French. This book deals mainly with the effect of the revolution on the culture and standard of living of the native Moslems.

Fanon describes the life of the traditional Moslem with their abhorrence of Western modernisation, their resistance against the French, who tried to initiate the emancipation of the Moslem women and improve standards of living and hygiene in the Arab communi-

ties. The Arabs were suspicious of the French and refused even to accept the advantages of Western medicine. With the advent of the revolution, the traditional family structure of the Moslems was shattered. The women, after centuries of subservience to their husbands, became agents for the FLN and later many joined the troops in the hills. Western medicine and means of communication were then adopted in order to increase the efficiency of the revolution.

The bulk of the book makes interesting reading but there are passages which are extracts from revolutionist newspapers which are very propagandist and somewhat dated in style. Fanon seems very biased against the European settlers, exaggerating the atrocities committed by the French army and government. The book ends with two narratives by Europeans, one a doctor, the other a policeman in Algeria. They give a less biased view of the French colonialists and give their own reasons for actively supporting the rebels.

In 1961 it was discovered that Fanon was suffering from leukaemia and he died later that year unable to witness the end of the war and the nationalists' victory.

F. E. ROGERSON.

In the Service of Old Age. Anthony Whitehead. Pelican, 5/-.

Anthony Whitehead is a psychiatrist whose main concern has been the welfare of psychogeriatric patients. This short book, which incidentally I felt could have been further condensed in its initial chapters, is a very informative account of the problems faced by geriatrics and those involved in their welfare. It attempts to dispel many of the prejudices that have been prevalent for so long, which have prevented proper assessments of the plight of the old, and maintained archaic methods and attitudes in their hospital treatment.

He describes the setting up of the hospital organisation at Severall's, Colchester, which seems to have accepted and successfully overcome these problems, with the result that many patients, who would have previously been regarded as long term, returned home within a very short time. One of the most important points emphasised, is that there is more to looking after geriatrics than treating their clinical conditions. Too often, their simple emotional and physical needs are more important, and in several cases the cause of their presentation at the hospital. The book is well organised and easy to read. I am sure that this, or some other similar to it, is essential reading for all medical students and laymen, in helping to eradicate the general indifference that exists towards one of the gravest social problems of the present time.

M. C. WHITE.

ART REVIEW

Picasso—I.C.A. 6th March—19th April.
Picasso, Moore, Sutherland. 20th March—1st May.

There are two excellent exhibitions on in London at the moment both including works by Picasso. One, showing at the I.C.A. in the Mall, consisting of 347 engravings by Picasso, executed in the summer months

of 1968. The other, at the Marlborough Fine Arts Gallery, Bond Street, has drawings and water colours by Picasso, Henry Moore, and Graham Sutherland.

I feel sure that Picasso executed his engravings purely for his own amusement. Even so, one can immediately recognise that they are the work of a great artist. Many subjects with which he has been engrossed for much of his life are seen here again, including the circus, Spanish grandees and the relationship between the artist and his nude model. This latter subject appears most often, sex seeming to be Picasso's favourite theme. However it is not the mere fact of sex fully exposed in a gallery which makes it so fascinating, but rather the way in which he treats the subject. It is impossible to describe the superb expressions, created by Picasso with a few deft lines, on the faces of both the participants and the "voyeurs". There are innumerable views of external genitalia beautifully rendered; and the last five or six engravings are like an illustrated Kama Sutra. Spanish soldiers walk around erect yet protected by thick armour plating; the "Three Cavaliers" spend much time abducting and raping a country wench and numerous nymphs lie invitingly while a superior looking Grandee studies them, calmly puffing on a long clay pipe. In this series of engravings, Picasso treats all his subjects with a similar wry humour, and it is this more than anything else which makes the exhibition so enjoyable. One must not however, ignore the purely artistic merit of the work, but as always this is so intangible that it is impossible to define or describe in words and can only be appreciated on seeing the exhibition for oneself.

At the end of the exhibition are some excellent photographs taken by Gjon Mili, both of the artist himself and of some of his best known works.

All in all the exhibition provides a most valuable and entertaining experience, a further incentive being the reduced admission fee on production of a Student's Union card!

The second exhibition is free, all the works on show being for sale, and altogether is on a smaller scale. Even so there are some excellent paintings by all three artists to be seen.

Some of the Picasso's were done about the time of his engravings and generally showed a similar style and subject matter. The drawings seemed to be hurriedly executed, and some were reminiscent of "child art", with crude crayon work adding splashes of colour. Even so they bore the unmistakable mark of a master.

The Moore's were mainly studies for his major works of sculpture and as such were extremely interesting. They became works of art of intrinsic value only by virtue of their fantastic colouring, and I feel that they were on show mainly to be bought as sound investments.

Graham Sutherland has already made his mark as a modern British painter and some of his paintings were fascinating. They consisted mainly of fantastic forms and colours, seemingly confused and yet together totally integrated. Perhaps the best were three landscapes, bathed in bright yellow sunlight and emanating a terrific atmosphere of the expectant stillness of sunset or sunrise on a hot summer's day.

This exhibition is well worth a visit and if you have enough cash to invest in an original Picasso, Moore or Sutherland so much the better.

C. J. HINDS.

RECORD REVIEW

Rawicz and Landauer. Music for Pleasure. MFP 2137 (mono only). 14/6.

With the death of Rawicz a few weeks ago, there ended a musical partnership that had lasted for many years, and this recording is a fitting memorial to that partnership.

The record, which is simply entitled Rawicz and Landauer, consists of seven pieces, the composers represented being Johann Strauss, Rousa, Gershwin, Liszt, Moszkowski and Chopin, i.e. a fairly mixed bag, but all from the light classical repertoire. Most of the pieces have been arranged for two hands by Rawicz and Landauer themselves and only in one piece, the

Strauss Fantasy, are they joined by an orchestra, the Halle under Sir John Barbirolli.

The music is played with a lightness of touch that few can better, and their own obvious enjoyment for the music comes over on the record. The music itself is "Light programme on a Saturday evening" material and if lightly-played light classical music is your cup of tea, then you will enjoy this record, which is very good value at 14/6.

The quality of the recording is not of a very high standard with a rather tinny piano sound, and I suspect that some of the pieces may have been recorded some time ago. The record is in mono only, but stereo would benefit the music little.

RICHARD WILLIS.

Road Test Renault 16-TS.

I have recently been, able to test the best selling 1600cc car in Europe, the Renault 16 of which 800 are manufactured per day in France. The version which I drove was the TS or Tourisme Speciale; forty per cent of the cars sold in England are to this specification. The TS is the high performance 16 and the most expensive Renault. It has the same trim as the Grande Luxe model, but as one would expect in a car of this type a rev. counter, clock, temperature gauge, two speed windscreen wipers, heated rear window, trip recorder and now compulsory leather steering wheel are included, to mention but a few.

The car, now a well known shape on English roads, has a front engine driving the front wheels. The gear box is ahead of the engine which thus lies at the back of the large bonnet space. Everything essential to the routine maintenance is easily accessible. The bonnet also contains the spare wheel, jack and tools and can be locked. The engine, beautifully cast in aluminium is of 1565cc capacity producing a real eighty plus brake horse power. It is very smooth and revs. freely up to a maximum of 6,000rpm. The only time it betrays that it is a four cylinder unit, is when being allowed to pull from below 1,600 rpm (the equivalent of 18 mph in top gear), which would not normally be done. The radiator is at the front of the engine and has an isolated electric fan enabling better temperature control and undoubtedly contributing to the almost complete absence of engine noise. The engine should be extremely reliable as it is relatively unstressed, the racing Renault Alpines producing some 150bhp from this engine. The body is the fashionable 3 door variety and is attached to the platform chassis producing a very rigid structure easily repairable in event of damage.

The ventilation and heating are extremely efficient, there are face level vents and, the ram effect can be supplemented by a two speed booster fan. The test car had the optional electric front windows, a bargain



at £36 and the electric sun roof at £78 which quite frankly is not worth having as it was rather small, noisy in operation, and draughty when the car was moving. I mentioned in my test of the Renault 6 that it was notably comfortable, the 16 is even more so. The seats "designed in conjunction with the Medical Profession", which may be why they fully recline, are made from moulded poly-urethane foam providing both comfort and good lateral support. The rear seat is a bench seat and has two positions, can be folded up or removed completely. It was useful to consult the instruction book before altering the position but very clear and easy when one did! The front seats have a central arm rest and glove box, the glove box lid is padded and enables the front seat to be used as a bench seat if so desired. There was plenty of passenger room in any position. The front seat has a reading light shining over the shoulder as in the rear of the Rolls Royce. The car has an ignition/steering lock illuminated at night on opening the front doors, which anybody who has stabbed aimlessly at night for a column lock will find a blessing. The

engine starts first time in a garage or if it has stood out, by engaging the choke of the Weber carburetter by fully depressing the accelerator, it will automatically disengage when the engine is warm.

The gear change is on the steering column and although this is against the trend, it works very well. There is plenty of torque enabling most driving to be done in third and top gears. The hand brake, on the driver's right, is of the umbrella type, it is best used as a parking brake and can be reached only by bending forwards, which is easy enough with the inertia reel safety belts on. I am told that it is being modified to bring it closer to the driver which should make it less awkward. The other minor controls are well placed and easy to use with one exception, the heater regulating valve. This is placed on the driver's right near the hand brake under the dashboard and enables the foot or face temperature to be varied; it cannot be seen at night and as the other heater controls are on the other side of the column it requires both hands to set up the heater initially. A thing that I particularly liked was the foot operated windscreen washer/wiper the first pressure wiping, the second washing from four jets, and a very big washer reserve.

The Renault on the road was all one expected. The engine was exceptionally quiet and unobtrusive unless driven particularly hard, capable of reaching 60mph from standstill in around 12 seconds, (thus leaving all but the more sporting machinery behind,) and going on to a maximum of over 100mph. This is merely academic in this country but what it does do is enable 70mph to be held indefinitely, with plenty in reserve. Fuel consumption was 26mpg but most owners should achieve about 30mpg on four star petrol. The tank holds a sensible 11 gallons, there is no reserve. Road noise was not noticeable because it was completely absent, this despite the car being shod with Michelin ZX tyres, steel braced and more liable to produce road noise. Wheels are a sensible fourteen inches in diameter and the tyres should last 30,000 miles if they

continue to wear as on the test car, which had done 9,000 miles. The suspension is typically French, set up with vast travel giving a boulevard ride even on the worst undulations, at the expense of some roll in fast cornering. The roadholding, meaning the actual grip available, was first class and its limit would never be reached on the open road. The handling, the behaviour of the car while it is gripping and beyond is of typical front wheel drive character. The car under-steered and as the speed rose became progressively more neutral the faster one cornered. Lifting off in the middle of a corner produced no drama, the car simply slowed itself down by under-steering front tyre scrub. The car though fast can thus be lent to and driven by wives, sons, daughters and friends who may not have much experience of fast driving, it is completely safe.

At night the square lights proved good on both range and spread, which is a change from most square lights. They are adjustable for varying load by small levers in the rim. The steering was light and positive with a bit too much self-centering for my own taste, but this does produce great directional stability and helps in cross-winds on the motorway. The comfort, silence and speed made this an ideal journey car, capable of high averages over indifferent roads. The brakes, servo assisted on this TS, are a disc/drum combination more than adequate for the performance. Maintenance is kept to a minimum, there are no greasing points, oil changes every 3,000 miles (engine) 6,000 miles (gearbox). The heating/cooling system is anti-frozen and sealed for life. The car used no oil during the test.

The cheapest 16 sells for £980, the TS for £1,203, tax paid. Both cars must be formidable competitors with their equivalents in the British market, and even more so in the E.E.C., the TS as a car with all extras included particularly so.

RALPH SMALLHORN

DIARY OF EVENTS FOR MAY

Saturday, 2nd

Rugger Club Hop.

Friday, 8th

Institute of Urology clinical meeting. "The work of the Testicular Tumour Panel".

Friday, 15th

Rugger Club Dinner and A.G.M.

Saturday, 16th

United Hospitals Guinness Stroll. Soccer Club Hop.

Friday, 22nd

Applications for the Barbeque Ball close today.

Saturday, 30th

Sports Day at Chislehurst at 3 p.m.

NOTE: All material for the July *Journal* should reach the Editor, TYPED, no later than 26th May 1970

SPORT

CROSS-COUNTRY CLUB

BART'S TAKE THE CUP

Sat., 7th March. Inter Hospitals Cross-Country Championships, 6½ miles, Chingford.

After a four year absence the Kent-Hughes Cup returned to Bart's. On Saturday, 7th March the Hospital defeated the London Hospital by 6 pts. in a very closely fought race. This success was due in no small measure to the magnificent effort of the captain, John Brooks, who flew back to London from Dublin on Friday night/Saturday morning and went on to finish third in the individual race; without his presence the Championship would have been lost again. The rest of the team were led home by Hugh Glennie who had an excellent race to finish seventh, probably the best performance in the team. Bob Miller was ninth and won the Cup for the first fresher home. The remainder of the scoring team was R. Moody, B. Campbell and M. Page. Special mention must be made of P. Taylor, R. Thompson and R. Hale all of whom contributed to our win by pushing the London scorers further down the field.

1. Bart's, 60 pts.
 2. London, 66 pts.
- Individual:
1. J. Booth, 36.49, St. George's.
 2. C. Dunbar, 37.49, St. George's.
 3. J. Brooks, 38.10, Bart's.
 7. H. Glennie.
 9. R. Miller, 12. R. Moody.
 16. B. Campbell, 17. M. Page. 19. R. Thompson.
 20. D. Taylor. 21. R. Hale.

Other Results

Wed., 25th February, v. University College, 5 miles, Shenley.

Bart's took five runners to this match and all five scored: just as well because if any other number had scored we would have lost. The individual race was won by K. Foster and H. St. John of U.C. but after that Bart's packed solidly in the middle of the field to win by one point.

1. K. Foster	U.C.	32.15.
2. H. St. John	U.C.	32.15.
3. J. Brooks	Bart's	33.12.
4. R. Moody	"	35.35.
5. R. Miller	"	35.40.
7. M. Page	"	36.50.
8. H. Glennie	"	37.50.

Wed., 4th March. 5th race in U.L. Cross-Country League, 4¼ miles, Teddington.

This race was run in a raging blizzard and the main object was to try and prevent the onset of frost bite. With J. Brooks away in Dublin (clever lad) Bart's fielded five runners in a small field of 60. Unfortunately D. Pinkard had to retire at the end of the second lap due to leg trouble. The rest of the team plodded on to finish 10th in the race and to 10th place out of 14 teams in the league Division I.

30th R. Moody, 30.33; 34th H. Glennie, 31.07; 37th M. Page, 31.33; 45th B. Campbell, 32.02.

In conclusion this has been a very successful and enjoyable season for the Club. Three runners have run for London University; we have won the inter Hospitals Cross-Country Championship and Relay Championship; we held a comfortable place in the league without any worries; we have finished second in the Porritt Cup race and the London University Track Winter Relays; we were also the second London University College to finish in the U.C. 5 mile open race—a race which includes Universities and Colleges from all over the country. Most important of all the club has maintained a good spirit and the support by all members has been excellent; we have also recruited a number of new members to our ranks, an essential part of the season if we are to continue to thrive in the future. Finally my thanks are due to all those who have helped to make this a most enjoyable season.

R. A. MOODY.

RUGBY CLUB

21st Feb. **Bart's v. Old Millhillians**

On the very muddy pitch, Bart's emerged as worthy victors though hard work was made of many aspects of the game. Laidlow, playing on the left wing, ran in for three very good tries, the second of which was an example of true winger talent. Having beaten his man on the outside and also the Millhillian cover, he then side-stepped inside the full-back to touch down after an exuberant drive. Cassidy's kicking further increased the score.

28th Feb. **Bart's v. Old Whitgiftians**

Morning kick-off

Bart's were unlucky to lose 14-6, a lack of cohesion and no possession not assisting the Hospital in their efforts to overcome the Whitgiftian side. There also existed perhaps a hangover from the preceding semi-final of that week, which Bart's won.

4th March (Wednesday). **Bart's v. St. Mary's**

HOSPITAL A.15 CUP

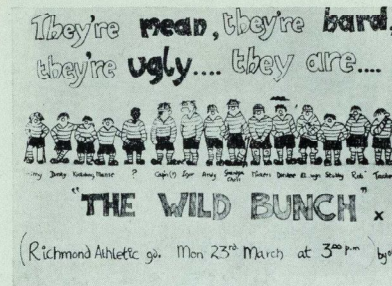
The game was abandoned after several minutes in the second half due to the insistence of the Mary's side, who realised that having played with the elements in the first half, and gone down 11-6, they would certainly be unable to hold a very determined Bart's side who regardless of the blizzard which was raging, played some interesting and forthright rugby.

Wed., 11th March.

INTER HOSPITALS A.15 CUP

Replay of previously abandoned game. Bart's won the replay with perhaps less ease than one expected but still managing to do so by 6 points to 3. A try by Fenton and a brilliant individualistic try by James clinching the match.

THE FINAL OF THE HOSPITALS CUP, 1970



The 83rd Hospital Cup Final was played at Richmond Athletic Ground on Monday, 2nd March, where Bart's were again meeting Guy's in an attempt to retain the Cup for the second successive year. The warm and sunny afternoon gave conditions which were ideal for open rugby.

The pre-match battles between rival supporters last year were not to be repeated because although Guy's were represented by over sixty suitably clad revellers armed with plaster of Paris bombs, opposition from Bart's was sparse if not totally lacking. Instead, a midnight artist from Bart's had daubed stands and the bar and every available window with slogans suitably confident of a Bart's victory. Therefore, for the most part Guy's unleashed their attacks on the more sedate members in the stand, where umbrellas proved invaluable defence against a rain of flour and soot.

Guy's kicked off the match, which proceeded at great pace with "boot and fist" much in evidence. It soon settled down with Bart's scrum showing its superiority and it was quickly apparent that the Guy's England International winger, Novak, was not to be given any room in which to play.

In the first 15 minutes, Elliot for Guy's had two unsuccessful penalty kicks at goal, and was particularly unlucky with the second which hit the cross-bar. The first score, however, came to Bart's with a very fine penalty goal by Cassidy from 40 yards away and just inside the touch line. After a further 20 minutes the Guy's hooker was penalised for a set scrum infringement, and Cassidy put over another penalty from the 25 yard line to make the score 6-0 at half-time.

The crowd in the stand were again treated to a fusillade of missiles from Guy's supporters during the interval, and when the game re-started the pitch was covered in a fine layer of flour and plaster of Paris.

Guy's began the second half with great vigour, and Bart's were again defending their line, but at this stage it became apparent that the large amount of possession supplied by the Guy's scrum was being wasted by their half-backs and centres rather than being driven to their two powerful wingers, Ross and Novak. Over and over again mis-directed passes and poor handling led to breakdown in the movements. In the line-outs Guy's

were obviously superior, but poor binding allowed McIntyre to break through and harass the scrum half. With 10 minutes of the second half gone an elusive run by Lambert took play to the other end of the field, and after a long throw to the back of the ensuing line-out McIntyre broke through and scored, a just reward for his tireless efforts. Cassidy failed with a difficult conversion and the score went to 9-0.

Soon afterwards Heslip made a break on the blind side, and sent Smith over for a try in the corner which was again unconverted by Cassidy. At this point a note of desperation was detected in the Guy's team, when Novak and Ross both moved into the centre. If this had been done earlier the game might well have been much closer, because almost immediately Novak broke through and was stopped only with difficulty. Even so, poor handling throughout the side lost them the initiative and although the Bart's back row of Smart, Mason and McIntyre has a very damaging effect on any three-quarter line, Guy's did not live up to their reputation.



In the last few minutes Laidlow had two good runs up the left wing, and it was from the last of these that the final score resulted. When he was tackled Bart's won the ball from the following loose scrum Heslip moved it to Cassidy and he coolly kicked an excellent drop goal. Cassidy's critics cynically pointed to the 3-man overlap outside him, but this was his finest moment, and the final nail in the Guy's coffin.

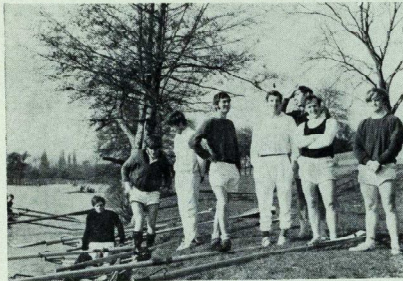
As the whistle blew for the end of the game amidst ecstatic cries from the Bart's supporters, 15-0 was a worthy result for the side who had played above themselves. The previous week the "A" fifteen had beaten Guy's in the Junior Cup final, and so the "Double" was attained. The efforts of Mark Britton and Robin Lambert, the Captain and Vice-Captain, and the inspiration of Keith McIntyre (the current Captain of Middlesex County) were amply rewarded.

The Team

N. Packer, D. Jefferson, B. Cassidy, A. Mason, J. Carroll, E. Lloyd, S. Smith, R. Lambert, J. Laidlow, M. Heslip, C. Smart, K. McIntyre, M. Britton (Capt.), N. Fairhurst, B. Rees.

T. Fenton—Touch judge.

BOAT CLUB



The Bart's VIII at Kingston Head of the River Race

Since the last report appeared the Junior eight has rowed in three Head of the River races, the U.L. head, the Kingston head, and the Tideway head.

This crew has been going out twice a week, weight training once a week, and have also had some tanking sessions with Chris Hudson; however, in the U.L. and Kingston heads they were not able to master the problems that have assailed them—of rushing through the stroke, and rowing short in the water. In the U.L. head they finished 16th out of twenty crews, and at Kingston they came 65th out of 82 crews.

After Kingston, the crew was reshuffled, and Tim Coyle moved to stroke. With another fortnight's training they were much improved, and in the Tideway head rose 69 places to finish 202nd out of 331 entered. In doing this they not only beat Westminster and Royal Free first boats, and the Guys second and third crews, but also caught up and passed the only foreign competitors, Ruder Geschellshaft, Germany. Their time of 20 min. 57 sec. was only 2 min. 50 sec. behind that of the winners, last year's British international crew.

Crew: T. Hunt, M. Erith, M. Harford-Cross, S. Whiting, J. Johnson, J. Lambley, A. Gray, T. Coyle, P. Smyth (cox).

N. J. C. SNELL

THE RIFLE CLUB

16th March.

Staff v. Student's Match

Although the students easily won the straightforward shooting, it was a close match when we used the N.S.R.A. "eccentric" targets, which no-one had practised at before.

The staff undoubtedly missed the straight shooting of the Club's President, Mr. G. L. Bourne. On the other hand it is very sad that Simon Crocker is now boosting the scores of the staff side and not that of the students.

The evening ended at the White Hart with due refreshment all round.

Students	Normal	"Eccentric"
Mike Rymer	95	97
Paul Ciclitira	86	96
Mike Pembrey	86	93
Gareth Tuckwell	93	96
John Johnson	91	97
Tony Knight	98	95
	549	574
Staff	Normal	"Eccentric"
Dr. Francis	83	91
Dr. Aumonier	91	94
Dr. Angell James	75	91
Dr. Rowland	79	96
Dr. Reckless	90	95
Dr. Crocker	98	100
	514	567

Postal Teams

These have been doing badly again recently and both teams will be low in the university leagues. This is mainly due to a much stronger opposition than usual!

The Hop

This proved very successful thanks to the hard work of John Johnson. About 375 came and danced to a very good group. Unfortunately the bar ran out of beer!

Bisley

Mike Pembrey and Tony Knight went to the University of London trials and may be selected for the University team.

GARETH TUCKWELL.

SAILING CLUB

March has been a disappointing month as regards the Wednesday races as they were all cancelled at the last minute due to snow and ice.

Our team's performance in the Castaways Cup was very good and they deserved to get further in the competition than they did.

As holders of the Harvey Wright golden bowl, we organised the event this year. The whole weekend was very enjoyable and we look forward to doing more sailing at Burnham in the future.
14th-15th March.

Castaways Cup

The Castaways Cup was sailed at the Welsh Harp on the week-end of the 14th and 15th March. It was a knock-out competition for U.L. Colleges. About twenty teams took part with three boats in each team.

The Bart's team consisted of: Roger Chapman, Charles Russel-Smith, Tom Moore, Jackie Heath, Andy M. Saywood, Dave Patuck.

Saturday produced some very uncharacteristic Harp weather, with the wind gusting force 5, providing some interesting racing. In the first few races there were several capsize, and one boat broke a mast. The racing committee ordered three reefs, which saved the boats from further damage.

We had a bye in the first round, so spent the morning shivering on the shore watching the first round being sailed and had our first set of races in the afternoon against Kings. We had a good start in the first race, and this set the pattern for the day. Roger Chapman worked out a good lead, and was never seriously challenged, finishing first by several minutes. Behind him there were some fierce tactical battles between the Kings first boat and Tom Moore, but the Kings boat slipped through to second place. Tom Moore came third, and Charles Russel-Smith had a creditable fourth, leaving the other two Kings boats to bring up the rear.

The second race was just as satisfactory. Tom Moore managed to pull out a lead which he held to the end. The race for the next three places was very close, with Charles Russel-Smith pulling through to second position and Roger Chapman coming fourth. The net result was a win for Bart's by several points.

This put us in a confident mood for our race on Sunday against St. Thomas's 2. There was less wind than the day before, but still enough to provide exciting racing.

The first race started well when one of the St. Thomas's boats misjudged his speed, rammed the transom of Tom Moore's boat, and had to retire. Charles Russel-Smith went into the lead and managed to hold his place to the finish. Unfortunately Roger Chapman was caught on Port tack by a St. Thomas's boat and had to retire. The finishing order was Bart's first and fourth. Charles Russel-Smith had touched a boat earlier in the race and as a result of a protest was disqualified. This was a blow to Bart's since it left us with only one finishing boat.

In the second race, after a mediocre start, Tom Moore had a collision with a Thomas's boat which had to retire. Roger Chapman went on to win, with

Tom Moore second and Charles Russel-Smith fourth. Unfortunately this was not good enough to give Bart's overall victory, which was disappointing since we were sailing faster than them.
T.W.M.

21st-22nd March. Harvey Wright Golden Bowl Trophy

Team: Roger Chapman, Mike Williams, Tom Moore, Dave Patuck, Andy M. Saywood, Charles Russel-Smith.

The Harvey Wright Golden Bowl was sailed at Burnham-on-Crouch on the week-end of 21st-22nd March. Ten teams from London Hospitals took part, sailing in Club Enterprises.

Bart's were drawn against St. George's in the first round. The first race was sailed in a heavy wind, which provided some interesting races, and a large amount of gear failure. This suited Bart's, since we were a fairly heavy team, and we finished first and fourth. Roger Chapman was unlucky in having to retire due to a defective boat, which filled up with water very rapidly in those conditions. The second race was sailed with less wind and with more reliable boats. Roger Chapman and Tom Moore finished together in second and third places, with Mike Williams in fourth place. The result of these two races was that Bart's beat St. George's and went on to meet the London in the next round.

There was virtually no wind at the start of the first race, with a strong tide running in the direction of the start. Roger Chapman and Tom Moore were both over the line at the starting gun, and it took several minutes before they both managed to clear the line. By this time the rest of the field were a long way ahead. Mike Williams managed to finish second, but the other two boats were unable to catch up. In the second race Bart's were unable to make up the points lost, and finished second, third and sixth. This gave the London overall victory.
T.W.M.

CANOE CLUB

The long distance racing season began on 1st March and two Bart's Paddlers competed in the Universities Championships at Bristol. Leaving Bart's at 6.30 a.m. we arrived at the start pleasantly surprised to find glorious sunshine (after Saturday's snow) and a very suitable course. The river was generally flat and deep with three weirs and a fishing competition to add to the excitement. Two of the weirs could be shot in racing boats, although several people ended up swimming. The third weir was portaged by all except the very

brave in slalom boats. In general the organisation was good but it was a shame the race clashed with the first national L.D. and that the team prize was awarded on the results of a non-racing boat class. The countryside around Bath and Bristol is really beautiful and in all it was a very enjoyable day. We both raced in single racing boats and were placed 4th and 5th.

(Aidie is being too modest; although she finished 4th overall she neglects to mention that she was run-away winner of the Women's section—Editor).

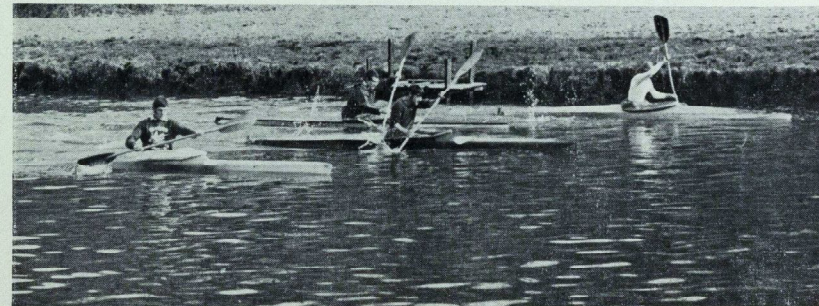


Photo: Steve Watts and Adrienne Huskisson racing at Bristol.

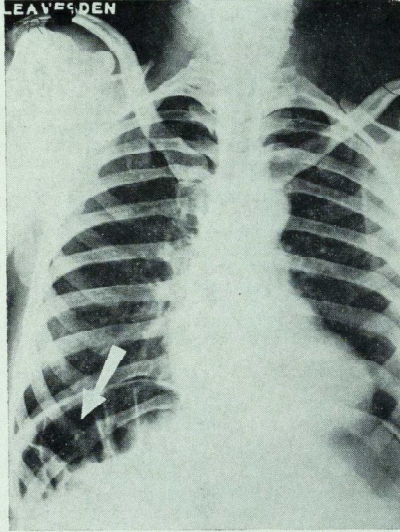
Spot The Lesion

By N. J. C. Snell

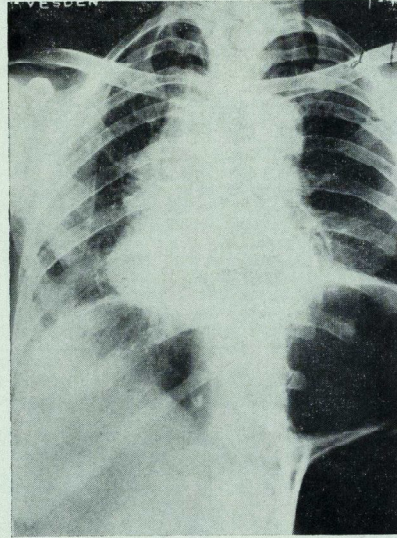
History: Both these X-rays were taken during routine mass radiography at a hospital for the mentally subnormal;

QUESTIONS:

1. What structure is indicated by the arrow on plate A?
2. What is wrong with patient B?
3. What connection is there between these conditions and the history?



A



B

- ANSWERS:
1. Fatiform colon, lying above the liver—this is a developmental anomaly of no functional significance.
 2. This plate shows the results of chronic acrophagy; the stomach is immensely swollen with ingested air, pushing both the liver and heart out of their normal position—there is probably no cardiac abnormality.
 3. Acrophagy is a fairly common behavioural abnormality among mental defectives, and surprisingly seems to cause them little discomfort. Congenital subnormality is often associated with physical abnormalities such as a Fatiform colon. (Case from Dr. W. E. Snell; advice was kindly given by Dr. Hamer).

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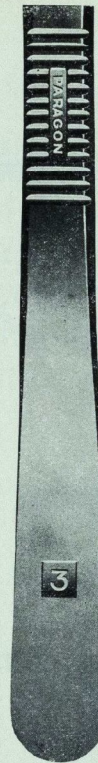
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Editorial

Two further stages in the Hospital redevelopment plans have now been completed. Many will remember the demolition of the School House which began in late 1966, and the commencement of new building in early 1967. The New Pathology block, which is described in this Journal by Professor Spector, is now finished and stands to be admired by all. Without going into technicalities, this new building appears pleasing to the eye and apart from its contrasting colour, blends well enough with the adjoining James Gibb House. In addition to the most up to date facilities, it also boasts a sun terrace.

The second change to have come about was the uneventful departure of the students from their old dining room. The use of both the Lay Staff and the Nurses' dining rooms, the latter with its added attractions, is now available to students. This has come as a welcome change since the food is cheaper, better cooked and of greater variety. Congratulations must go to both dining rooms for being able to absorb the increased numbers without any obvious inconvenience to their customers.

It is at a time such as this when stages in the redevelopment scheme come to fruition that one asks how much of the plans are truly to be completed. It is a difficult task to design new development which will satisfy those for whom the buildings are planned, those whose buildings will be condemned, the appreciators of architecture and the sentimentalists. The View Day Supplement, May 1967, does indicate sweeping changes such as the demolition of not only the East and West Gibb's wings and Surgery House, but also of Butchers' Hall, and the closure of Little Britain.

It is to be hoped that full consideration has been given to alternative ideas, such as the retention of the façades of the Gibb's wings, as in the Nash Terrace in Regent's Park. Once down they cannot be rebuilt and according to the plans the West Wing is only making way for a car park!

Letters to the Editor

COLLEGE HALL DAMAGE

College Hall,
Charterhouse Sq., E.C.1.

Dear Editor,

I would be grateful for the opportunity to comment on the efforts of the maintenance staff in clearing up the quite exceptional shamble resulting from the pre-cup Final activities of less responsible students.

Those of your readers who visited Charterhouse on the mornings after the Guy's visitations will realise the extent of the damage. Certainly, on first inspection, it was my view that a great deal of the work would have to be put out to external contractors. The cost of this would have been staggering. After discussing the problem with Mr. Spalding, he convinced me that we should persevere with his staff to see what progress could be made.

As a result of their efforts, the amount of work that would have had to be done by outsiders has been cut to a fraction. I will not say that those efforts were made without complaint. When someone has spent three days scrubbing paint off brickwork, and finds, on the morning of the fourth day, that further vandalism has rendered all of his efforts useless, it would be unreasonable to expect him not to express his views. Such is the loyalty of the staff, that it was astonishing to find the restraint with which these views were stated. I do not suppose that many of those who took part in the various raids, had given much thought to the fact that this sort of loyalty can only survive if it is not grossly abused.

Most people accept that a reasonable amount of generation of tension will occur before a Cup Final. That this should degenerate into a situation where lasting damage is done to buildings by the use of paint and plaster could only be accepted by morons.

It is, of course, a fact that the responsibility for this does not rest solely on the shoulders of Bart's students. There was another hospital involved. However, the point is not "who hit who first?", it is that, if the use of paint and plaster and other destructive materials by both sides cannot be completely ruled out, then the image of the Hospital's Cup will suffer irreparable damage, and the authorities of the Colleges concerned are going to be faced with a situation calling for drastic action.

The cost of this is now being counted—I nearly said "computed". It is to be hoped that, in this connection, students will remember that but for the efforts of the maintenance staff on this occasion, the bill would have been far more crippling.

Yours sincerely,

C. D. H. NIXON,
Bursar.

BUILDINGS

Royal Northern Hospital,
London, N.7.

Dear Editor,

Unfortunately I did not read your View Day Supplement of 1967 and was therefore unaware until reading your editorial (April 1970) that under the new hospital development plans the Gibbs Wings are due for demolition. I sincerely hope we are not all going to sit by and allow this destructive act to occur. Perhaps it would be possible for the *Journal* itself to campaign against this. Firstly I would suggest that a brief article running over the proposed plans would be well worth repeating. Secondly it would be worth researching possible alternative solutions and thirdly I suggest that a Questionnaire be enclosed with a future issue of the *Journal* which asks for readers' views on the proposed plans. Surely a unanimous condemnation by your readership would certainly cause the planners to pause and think. However far in the future these plans may be for, now is the time to act, before decisions have been made which cannot be reversed.

Your sincerely,

E. M. HOARE.
(Surgical Registrar, R.N.H.).

The *Journal* would be pleased to hear and publish the views of other readers.

Dear Editor,

Anent an article in the March *Journal* re "Student Travel Abroad"—if any students from Bart's come to Johannesburg, and require information, help or would like to house visit (socially) please get him/them to contact me. I shall be glad to be of any assistance.

My old friend Mr. Ian Todd—on the hospital staff—would be able to give them help in seeking me out, but my phone nos. are: Res. 41-8787 and 41-9628. Day phone no. is: 834-5061, which is the office of the District Surgeon Johannesburg.

Other Bart's men in Johannesburg include:

Dr. Jonathan Gluckman—Pathology.
Dr. George Frampton—Ophthalmology.
Dr. K. G. Irving—Pathology.
Dr. Alan Orlek—Surgery.
Dr. W. T. Ross—Orthopaedic.

Yours sincerely,

LESLIE FVY.

Announcements

Engagements

FAIRCLOUGH—HORSLEY—The engagement is announced between Dr. Peter Donald Fairclough and Miss Elizabeth Ann Horsley.

GRAHAM—WITHERS—The engagement is announced between Dr. William Bryce Graham and Miss Sarah Elizabeth Withers.

Deaths

ELGOOD—On March 28, Dr. Cyril Lloyd Elgood, M.D. Qualified 1924.

GREEN—On February 20, Dr. Arthur Llewellyn Baldwin Green, D.S.O., T.D., M.R.C.S., L.R.C.P., aged 92. Qualified 1902.

WILLIAMSON—On April 5, Dr. Charles James Frederick Lloyd Williamson, aged 65. Qualified 1928.

Oxford

The George Herbert Hunt travelling Scholarship for 1970 has been awarded to Dr. Harvey White.

Appointments

Southampton University

The honorary title of clinical professor of pathology has been conferred on Dr. E. M. Darmady, senior pathologist to the Southampton Group Laboratory Service.

University of London

Dr. J. G. Widdicombe has been appointed to the chair of physiology tenable at St. George's Hospital Medical School.

Change of Address

Dr. W. S. Hinton is now at Puffins, 8 Church End, Redbourn, St. Albans, Herts.

Dr. J. F. Varley is now at 222 Upper Shoreham Road, Shoreham-by-Sea, Sussex, BN4 6BG.

CHARTERHOUSE BOOKS

Nearly sixty reference books, all of which have been purchased for the Charterhouse Library within the last twelve months, are missing from the Library. If you have any library books, or if you find any, please return them immediately.

Financially speaking almost £200 worth of books are missing from the Branch Library, and those from the Main Medical College Library would probably amount to a similar sum.

The Library is for everyone's use and many readers are seriously inconvenienced when books disappear, so please make sure that any you have borrowed are returned forthwith.

MISS MIRIAM LAW

Many students who entered the College between 1954 and 1962 will remember Miss Law, who presided over the Charterhouse Branch Library during that period. Her death on April 23rd in her early eighties removes from our midst an active, sprightly figure who served the College in other capacities after her retirement from the Library.

Miss Law served in the women's services during the first World War, and held a diploma in music, of which she was very proud. She was driving in the Hospital car service in 1954 when she came to the Library, and the parking of her car in Charterhouse was a constant source of dispute between her and the Dean. I am inclined to think that Miss Law eventually won!

The Library was then housed in a prefabricated hut, too small for the numbers of books and readers. Miss Law took her duties very seriously, endeavouring to keep control of both. The disappearance of a book was a major tragedy and a reflection upon her ability as custodian. Noise inside or outside the Library was quickly suppressed by a stern warning, and to neglect to return books immediately when requested was to invoke extreme displeasure, forcibly expressed. The student who presented one daffodil as a peace-offering with the tatty book probably still remembers the encounter. A Valentine card also went unappreciated!

Before the rehousing of the Charterhouse Branch Library conditions were difficult both for staff and readers. Cramped quarters and a small stock made it impossible adequately to provide a library service, but it was necessary to have a custodian to supervise. Miss Law did her very best to preserve the stock and to assist serious readers. These appreciated her efforts, for she spared no efforts to provide the information required. She was willing to assist in erecting cases and moving the books—in fact, it was impossible to restrain her. A small, prim person, she was most active for her age, which she refused to acknowledge, although she had little time for modern trends in dress and manners. The College regrets the death of a former employee, and those who knew her mourn the passing of a figure from the past who contributed her mite to the future.
J.L.T.

DIARY OF EVENTS FOR JUNE

Wednesday 3rd

Bart's Choir "The Dream of Gerontius" by Elgar at 19.30 hrs.

Friday 12th

Clinical meeting of the Department of Urology; "Management of Renal Calculus Disease" by Dr. Harrison of St. Peter's Hospital.

Wine Committee 1970 Barbecue Ball.

Tuesday 16th

International Hospital Equipment and Medical Engineering and Service Exhibition at Earls Court, 16th-19th.

Friday 19th

Thirty-Fifth Annual Dinner of the 11th Decennial Club at 7 p.m. in the Great Hall. Mr. H. B. Stallard will be in the chair.

The New Pathology Block

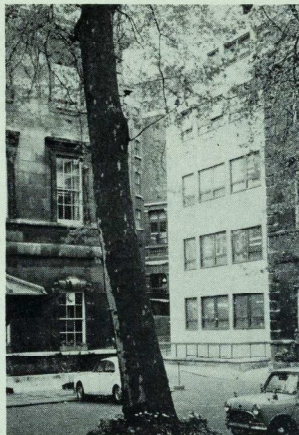
By Professor Spector

Nobody in the hospital can have failed to realise the apparently somewhat slow and painful emergence of a new pathology block wedged tightly between the existing pathology building, the museum building and James Gibb House. In fact the new structure is merely one part of an extensive expansion of pathology facilities. The total scheme includes not only the new building, but also a complete reconstruction of the interior of the existing pathology building, the conversion of 51-53 Bartholomew Close in a modern laboratory block, and the conversion of the Dundee Linoeum building in Little Britain into a fully equipped Blood Transfusion Department. In addition the ground floor of the museum is to be transformed into a teaching area with a display section, two seminar rooms and a postgraduate journal library.

The need for increased space for pathology has been only too obvious for some time since the existing building dated from 1909, although at that time apparently it was embarrassingly large. The problem of its replacement was very difficult because of the need to maintain services during the rebuilding phase and because of shortage of space. After some debate it was agreed to put up an extension building adjacent to the existing building on the site of a structure known as School House, which was used as a residence for various female staff, and reconstruct the existing building. This plan was finally approved by the then Ministry of Health and the University Grants Committee in 1965, who also agreed to share the cost (approximately £450,000). Demolition of School House began in late 1966 and the new building was started early in 1967, much difficulty being experienced with the foundations because of the continuous habitation of the site since roman times. Disappointingly no archaeological discoveries were made, or at least none were reported during the excavation.

While work was in progress in 1967, the Governors seized an unexpected opportunity to acquire possession of 51-53 Bartholomew Close and authorised its conversion to laboratories, first to house the new Department of Haematology under Professor Mollin, and then to act as a decantation area for the Departments of Bacteriology and Chemical Pathology. With the expansion of Haematology it had become apparent that the space originally allotted to Blood Transfusion in the plans was inadequate. The Governors therefore agreed to convert the recently acquired Dundee Linoeum Building in Little Britain to a Blood Transfusion Department.

Under the original plan the new extension building should have been complete a year ago, but partly because of labour shortage and partly because of changes in overall planning this step has only just been achieved, i.e. April 1970. The extension building will house Histopathology, Experimental Pathology, Immunology, Cytology, Neuropathology, Virology, Isotopes, Electron Microscopy, administration, and also a common room cum seminar room complete with balcony. Much of this building will be devoted to



research.

When reconstruction of the existing pathology building is complete in the Autumn of 1970, it will house Bacteriology, Haematology and Chemical Pathology, with the Dean's offices on the ground floor. The top floor will contain the post mortem room and an enlarged animal house. The building at 51-53 Bartholomew Close will then become a research block not only for the three departments named above, but also for other hospital specialities. The conversion of the ground floor of museum should be complete by the end of 1970.

Pathology facilities will then comprise a tri-partite complex on the present site involving all branches of the subject in both their academic and hospital service aspects with two annexes in the hospital precinct, research laboratories in Bartholomew Close and a Blood Transfusion Department strategically placed in Little Britain.

The new building (and the reconstructed existing building) was designed by Messrs. Adam, Holden and Pearson, one of England's leading hospital architects and incorporates all the specialised features that one would expect such as demineralised water "on tap", piped oxygen, acetylene and other gases, and a three foot high crawlway above false ceilings throughout the building in which the heating and other services are placed for easy accessibility. Although all the laboratories have been custom-designed for a particular purpose, there is sufficient flexibility of layout to accommodate future developments. Provision for computers has been made for both Haematology and Chemical Pathology and there is space for two electron microscopes. Those concerned in the planning of the buildings feel that the new pathology complex will be worthy of Bart's and hope that as many others as possible, including the students will soon have an opportunity of forming their own opinions.

Some Facts on the Emigration of British Doctors

By Andrew Orr

One of the manifestations of the arrival of Spring in the hallowed halls of Bart's is a marked increase in the migratory instinct. In some this is observed in the proliferative phase of lush photogenic travel literature: perhaps there is talk of a quick weekend in Torquay, or maybe its Teheran this year. The more astute observer may have noticed that quite a few others are contemplating more drastic steps, such as leaving the Mother country once and for all. An idle fantasy? A dramatic gesture? This article tries to point out some of the alarming facts, but does not aspire to underline the surely well defined causes.

How many go?

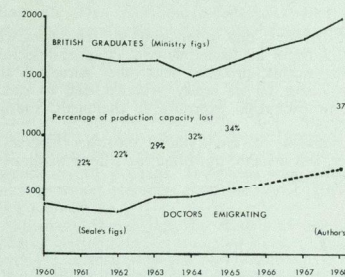
A survey in Scotland (Last, Social and Economic Administration October 1967) showed that, depending upon location, 20-40% of all Junior Hospital Medical Staff were at any one time seriously considering emigration (i.e. they had taken positive steps, such as obtaining literature). This is not a wild estimate, for it is borne out by the actual numbers of British doctors who take this step, figures which are so alarming that it is not surprising that no official statistics are available. Two surveys in the early sixties (Seale, *BMJ* 3/9/66; Abel-Smith & Gales July 1964), correlate well and give the only reliable evidence available. When I became interested in this subject I found no figures at all for after 1965 so I went to each of the major embassies in London and asked for the numbers of British doctors passing through them for permanent settlement abroad. In this way I was able to arrive at an estimated (conservative) total for 1968 of 730.

It is obvious that the real significance of such figures lies in the percentage of our capacity to train doctors which is lost annually through emigration. I have tried to represent this in the graph below, and I would stress that, during 1968, in effect more than *one new doctor* in there left the country for permanent settlement elsewhere.

In 1968 Britain was extravagant enough to maintain the equivalent of three of London's teaching hospitals, say Bart's, Guy's and Mary's, for the sole purpose of supplying the 378 doctors who went to Canada in that year. Indeed my researches put Canada well at the top of the list in popularity of emigration choice, followed by the U.S.A. (with 163)*, Australia (97), South Africa (approx. 35) and New Zealand (approx. 30); a selection of other countries around the world take the rest.

At what age do they go?

It is interesting to note that the ages at which our graduates leave have a striking connection with their promotional "progress" within the N.H.S. Ash-Mitchell (*B.M.J.* 2/3/68) showed that of the total of emigrants 37% are under 30 years old, 50% between 30 and 39, and the remaining 13% over 40.



Copyright "Scope."

At what cost?

K. R. Hill (*Lancet*, February 1968) estimated that the cost of producing one doctor is in the region of £14,000, which means that the country is annually losing £10,000,000 worth of doctors. It is rather surprising that the Chancellor has been able to turn a blind eye on a figure of this magnitude, let alone the Minister of Health.

And the future?

One might well ask "why no alarm?", "why no action?", and the answer is that the deficit is for the time being masked by our complement of immigrant doctors. These now comprise almost exactly 50% of all Junior Hospital Staff (66% S.H.O.'s and 54% of Registrars), and have become the very backbone of the N.H.S. However, there are signs that their supply is already dropping off, and in time, as their mother countries progress, it must be expected that many will return home. The combined factors of the extravagant emigration of British graduates, and the cessation of our immigrant supply must, within a very few years, be incompatible with the continuation of the N.H.S.

Are we to be thankful that perhaps one in every three students who read this article will not be around to witness this final catastrophe?

* This is expected to decrease after the July 1968 U.S. Immigration Act, but the Canadian are hoping to absorb the "surplus."

† Figures for the first three months of 1970 show that only 63 immigrant doctors arrived, in contrast to previous quarterly figures of around 200-250.

Disease and Death from Avoidable Causes

By Mr. Denis Burkitt*

Most disease is due to environment. This goes without question for all bacterial, viral or other infections, including worms, protozoa and other parasites. It is obviously true of all injury, whether due to sudden impact or prolonged exposure to chemicals, sunshine or cold.

The influence of environment on other illnesses is, however, less evident, but often, as I hope to show, no less profound.

Atheroma

The most frequent cause of death in North America and Northern Europe is atheroma and, in particular, coronary occlusion and cerebro-vascular accidents. In the U.S.A. the incidence in white and negro populations is closely comparable, but the negro in rural Africa is almost totally free from this disease. I know of no single case of coronary disease or cerebro-vascular accident in a village African, and even in large towns these conditions are still exceedingly rare. The cause must therefore be sought, not in genetic background, but in environment, and almost certainly the man-made environment associated with economic development.

Cancer

The second commonest cause of death in the affluent west is cancer. In men, the two commonest forms of cancer, which stand head and shoulders above all the others, are tumours of the lung and large bowel, including the rectum. In women, lung and breast cancer head the list.

Again, the incidence of lung and bowel cancer is almost the same in black and in white Americans living in similar circumstances, and breast cancer is only slightly less common in negro than in Caucasian women.

In contrast, cancer of the large bowel and lung are virtually unknown in rural Africa, and breast cancer is only one-tenth as common as in North America.

Once again, the cause must be sought, not in hereditary tendencies, but in manner of life.

Dental Caries

Dental caries is said to be the commonest disease affecting western man. It is rare in primitive communities and the jaws from the graves of our ancestors bear testimony to their relative freedom from this scourge of modern man.

Diabetes

This is our commonest endocrin disorder. I recently talked with a doctor who detected no case in 11 years at a mission hospital in a little developed part of Africa. No evidence of diabetes was found in a recently investigated Polynesian island. Ted Williams, an old Bart's man, saw no diabetes in a mission hospital in Uganda until after the importation of factory processed sugar. There as elsewhere the incidence is now rising, as is that of dental caries.

Appendicitis

This is the commonest abdominal emergency in the so-called civilised world, irrespective of race. It is almost unknown in rural communities in less developed countries. I know mission doctors doing much surgery who have not seen a case in 20 and more years. Acute appendicitis is however becoming increasingly common in urban dwellers in Africa, and among the staffs and pupils of educational establishments and hospitals.

Diverticular disease of the bowel

This is the commonest pathological process affecting the large bowel in Europe or America. In America it is common in the negro race, though less so than in the white population. It is probably equally common in those of different races who have lived all their lives in comparable environments.

In 20 years surgical practice in Africa I never saw a case of diverticulitis and a questionnaire distributed to hospitals throughout the continent confirmed that this condition is virtually unknown outside large cities, and even there it is still rare.

Varicose veins

This is the commonest vascular disorder in affluent communities. It is very rare in Africa. Some ten per cent of adults in the United Kingdom are said to have varicose veins. On one occasion during routine medical inspection for control of sleeping sickness, with a compulsory total turn out of the whole population, I found only five cases of varicose veins, none severe, among over 4,000 adults. In view of the lack of subcutaneous fat in these people, even this figure of recognisable varicosities would have been lower or perhaps reduced to nil if the veins had been partly concealed in adipose tissue as in western communities.

Hallux Valgus

This is perhaps the most prevalent foot deformity in communities condemned to conform to shoe fashions. We can confidently expect the incidence to fall as a result of the present sensible fashion in ladies' shoes in contrast to the previous custom of placing the sole on a steeply inclined plane so as to crash the toes into a narrowing cone.

One might go on listing illnesses which are obviously closely linked with man's "progress". I have limited myself to a list of superlatives—conditions which come under the heading "commonest" in the west and are rare or unknown in communities little influenced by the industrial revolution; the commonest killer, atheroma; the commonest form of cancer, lung and bowel; the commonest disease, dental caries; the commonest endocrine disease, diabetes; the commonest abdominal emergency, acute appendicitis; the commonest bowel disease, diverticulae; the commonest vascular disorder, varicose veins and the commonest foot deformity, hallux valgus.

In the light of these observations it is surely strange that so much time, thought and money are expended on devising cures for these common complaints and so little in exploring the underlying cause. Yested financial interests are heavily weighed towards curative rather than preventive medicine. Radical reduction in the incidence of a common disease could seriously jeopardise sections of the drug industry.

Let us look at the possibilities.

1. Atheroma and Diabetes

Both these conditions are rare in all less developed communities and are closely associated with western life. In view of the close association between atheroma and diabetes, not only in the geographical distribution of both, but also in the tendency for the two conditions to be associated in individuals, a common cause may at least be suspected.

The marked rise in both these conditions observed in Indians following emigration to South Africa, and in Jews following emigration from the Yemen to Israel (Cohen 1960), and in Africans shipped from the slave-trading regions of the West African coast to North America, further suggests a common aetiological factor. Moreover, as Cleave et al. (1969) have so clearly pointed out, the increased incidence in both instances was associated, although with a time interval, with a vast increase in the consumption of refined carbohydrates, white flour and sugar in particular. Whether or not the relationship is casual it at least provides a hypothesis for testing which is consistent with available information.

2. Cancer of the Lung

Lung cancer is now recognised as being largely attributable to tobacco smoke.

3. Cancer of the large bowel, appendicitis and diverticular disease

Cancer of the large intestines occurs commonly in the same communities as those susceptible to diverticular disease and appendicitis (Burkitt 1969). These three conditions will therefore be briefly considered together. They occur in communities who have substituted refined flour and purified sugar for the coarser meal and sugar cane formerly consumed in African village life. This reduction in cellulose content of food results in a greatly delayed intestinal transit time. This is reflected in the constipation of civilisation which results in 35,000 gallons of liquid paraffin being consumed annually in this country and five million pounds being spent on laxatives over and above 3,500,000 N.H.S. prescriptions. Small firm stools require exaggerated muscle contraction to ensure propulsion and high intra-colonic pressures result. Diverticulae and appendicitis are probably associated with raised intraluminal pressures resultant from the firm consistency of bowel content.

Malignant disease may be related to ingested carcinogens concentrated in the small stool volume and in prolonged contact with the bowel mucosa on account of the increased transit time (Ottlé 1967). Alternatively, the faecal hold up with consequent changes in bacterial flora may lead to the synthesis of carcinogens from normal stool constituents. (Wynder et al 1969).

Dental caries

This is acknowledged to be largely due to refined sugar, particularly when consumed unadulterated between meals. Diabetes may well be due to the over-consumption of refined carbohydrate and in particular sugar. Convincing evidence has been put forward by Cleave et al (1969) who attribute the unusually high incidence of diabetes in Natal Indians to the fact that they consume on average ten times more sugar than their relations in South India. They are approximately ten times as likely to develop diabetes and suffer from a corresponding increase in coronary disease.

5. Varicose veins

Whatever the cause of varicose veins, prolonged standing can be discounted as a major factor. African herdsmen can probably out-stand the majority of American negroes. It has been postulated that loaded colons may impede venous return, a hypothesis not proven but consistent with epidemiological evidence.

Discussion

Food for serious thought is provided by the observation that diseases suspected of being related to concentrated carbohydrate intake are not only epidemiologically related to those possibly attributable to fibre depletion, but also tend to be associated in individuals. The removal of fibre from wheat and from beet or cane sugar results in refined products which are consumable

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REFERENCES

- BURKITT, D. P. (1969). *Lancet*, 2, 1229.
CLEAVE, T. L. (1956). *J. Roy. nav. med. Serv.*, 42, 55.
CLEAVE, T. L., CAMPBELL, G. D. and PAINTER, N. S. (1969). "Diabetes, Coronary Thrombosis and the Saccharine Diseases." 2nd Ed. Bristol: John Wright & Sons Ltd.
COHEN, A. M. (1960). *Israeli med. J.*, 19, 6137.
OETTLER, A. F. (1967). "Tumors of the Alimentary Tract in Africans." *Nat. Cancer Inst. Monograph* 25, 25, p. 97.
WYNDER, E. L., KAJITANI, T., ISHIKAWA, S., DODO, H. and TAKANO, A. (1969). *Cancer*, 23, 1210.

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Gastroenterology Supplement No. 6

SOME RECENT OBSERVATIONS ON LIVER DISEASE AND PORTAL HYPERTENSION

R. Zeegen

The majority of patients with liver disease are referred to this hospital with portal hypertension and gastro-intestinal haemorrhage. A retrospective survey of some 250 of these patients was undertaken, based primarily on liver histology taken at the time of portal decompression, and a comparison of the review diagnosis with clinical details. This entailed altering the morphological diagnosis in some 26 per cent. of the entire group. This article deals with: (i) the findings and relevance of two facets of the survey, and (ii) the incidence of cerebral dysfunction following portal decompression, and the treatment of severe chronic encephalopathy with Lactulose.

Perhaps the major threat to life in the cirrhotic patient with portal hypertension is haemorrhage from oesophageal varices. Indeed the first haemorrhage is often fatal. Cohn and Blaisdell (1958) from the United States reported a first bleed mortality of 86 per cent.; Sherlock reported a 33 per cent. mortality in 1964, and Hislop et al (1966) a mortality of 54 per cent. from the initial haemorrhage. The cirrhotic patient may also succumb to other hazards such as infection and hepatoma, and a recent paper (Stone et al 1968) reviewing 155 unselected cirrhotics admitted during a six year period to a Birmingham hospital reported a five year survival of no more than 14.3 per cent. Thirty-one of these patients had bled and only one of the six patients fit for portal decompression survived operation. The survival of their patients with ascites was identical to that reported in 1944 by Ratnoff and Patek. Although results from this hospital paint a less gloomy picture, it should be stressed that patients coming to portal decompression by Mr. Alan Hunt were highly selected. This was because they had already survived one or more haemorrhages prior to transfer, and subsequent liver function was sufficiently well preserved to fulfill the major criterion for operation—a serum albumin of 3.5G% or greater.

While it is incontrovertible that satisfactory portal decompression prevents death from variceal haemorrhage, it is possible that by operative intervention incapacitation and death from portal systemic encephalopathy and liver failure is merely substituted for death from bleeding. This has certainly been the conclusion of a number of controlled prospective American trials when prophylactic shunting (demonstrable varices but no bleeding episodes) was considered. (Conn and Lindenmuth 1965, Resnick et al 1969) similar carefully planned trials such as those of

Resnick et al (1969) are lacking for the therapeutic shunt both in the United States and in this country, and the problem is as yet not fully answered. The results of American series, cannot in any case be extrapolated to this country as the majority of the former patients are unreformed alcoholics and often many different surgeons take part in the trials. In Britain there are far fewer cases of alcoholic cirrhosis, and in this hospital for instance, patients are dealt with by one surgeon whose experience of portal decompression extends back to 1948. Nevertheless a review of our highly selected patients has revealed some important facts.

1a. Non Cirrhotic Intrahepatic Portal Hypertension

Of over 250 patients with intrahepatic portal hypertension decompressed during the nineteen year period ending 1967, forty-eight lacked the histological criteria of cirrhosis when the operative wedge biopsies were reviewed (Zeegen et al 1970). Apart from four patients with congenital hepatic fibrosis and two with widespread granulomata, the liver histology revealed a subtle disorganisation of architecture, with abnormal hepatic vein, portal tract relationships, and varying degrees of portal fibrosis. Nodular regeneration, widespread marked fibrosis, cellular infiltration and bile duct proliferation were not seen. (Fig. 1).

When the histological features of all the patients were related to the clinical details the difference that was immediately apparent was the far better survival of the non cirrhotic patients. The five year survival was 83% (30 of 36), and the ten year survival was 77% (20 of 26). This was contrasted to the figures for cirrhosis of mixed aetiology of 43% (65 of 152) at five years and 22% (19 of 87) at ten years. (Fig. 2).

The improved survival was due to the static nature of the liver lesion which was little changed even after fifteen years in one case. Liver failure was rare as a cause of death in the non cirrhotic group for only four patients died in this way as compared with sixty of the cirrhotic patients. Eight of the non cirrhotic patients came to necropsy from two to thirteen years after portal decompression and although the livers were generally shrunken and tough, none had progressed to cirrhosis.

There was little, pre-operatively to distinguish the individual non cirrhotic from the cirrhotic patient, and at operation, in spite of the seemingly mild histological



FIGURE 1. The operative wedge biopsy from a patient with non cirrhotic intrahepatic portal hypertension. The mild fibrosis and abnormal vascular channels are clearly seen. (Reticulin preparation x 9).

changes the mean portal venous pressure measured at operation (Hunt 1958) was similar in the two groups. The non cirrhotic livers were firm and the surface described as wrinkled, irregular or granular and the patients tolerated operation very well. The operative mortality was nil, compared with an overall mortality for the cirrhotic patients of 10% (4.3% during the period 1957 to 1967).

The aetiology of the condition is not known but similar entities have been described in other parts of the world, notably India (Basu et al 1967), the United States (Mikkelsen et al 1965) and Japan (Imanaga et al 1962). Whether the condition is congenital or the result of previous injury or long continued increased splenic inflow, there is no doubt that these patients were eminently suited to portal decompression.

1b. Primary Biliary Cirrhosis

This is a condition of unknown aetiology which is characterised by prolonged intrahepatic cholestasis affecting typically middle aged females. The average duration of the condition is five to six years and liver cell failure and portal hypertension have hitherto been thought to be late or terminal features. The clinical spectrum of the condition must now be broadened, for in fifteen (65%) of the twenty-three cases in this series, the first manifestation of the disease was bleeding from oesophageal varices (Zegen et al 1970). In the remaining eight the variceal haemorrhage was after years of pruritus and jaundice and conformed to the classical concept. The histological diagnosis was based on the monolobular pattern, focal lymphocytic aggregates, destruction of medium sized bile ducts and portal and parenchymal granulomata. Where doubt existed, distinction between primary and secondary biliary cirrhosis was made from the clinical details. Corroborative evidence was obtained in a number of cases by anti-mitochondrial antibody titres. Routine liver function

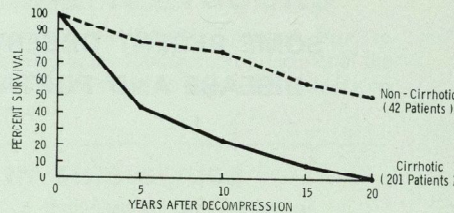


FIGURE 2. Comparison between the post decompression survival of patients with non cirrhotic and cirrhotic portal hypertension. The *Journal* gratefully acknowledges the permission of the Editors of *Gut* to use the above figure.

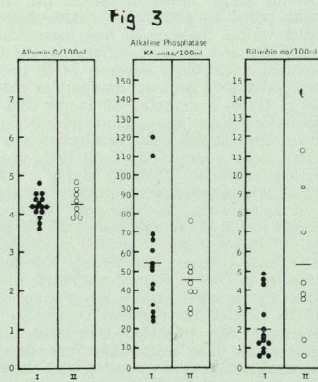


FIGURE 3. Liver function tests in Primary Biliary Cirrhosis. Group I—the atypical fifteen patients presenting with variceal haemorrhage. Group II—the eight patients where haemorrhage was a late manifestation. We are grateful to the *Lancet* for permission to use the above figure.

tests demonstrated an underlying cholestasis in the atypical group quite comparable with that of the patients with typical presentation (Fig. 3).

The above findings have inevitably been extended to show that a pre-symptomatic stage of primary biliary cirrhosis may exist with normal liver function, but with positive anti-mitochondrial antibodies and abnormal liver biopsies. (Sherlock et al 1969; Walker et al 1970). The histological abnormality more commonly found however, was a chronic hepatitis and as chronic active hepatitis, primary biliary cirrhosis and "cryptogenic" cirrhosis are the only chronic conditions in which elevated mitochondrial antibody titres are regularly found, this has led to the formulation of a "unified concept of auto-immune hepatitis" (Doniach and Walker 1969). It was postulated that auto-immune phenomena may be responsible for these conditions where the brunt of the disease was borne either by the bile ducts (primary biliary cirrhosis), or by the liver parenchyma (chronic active hepatitis). The end stage of either of these may be so called "cryptogenic" cirrhosis. This would tend to rationalise the use of immunosuppressive agents in the early stages of the two conditions. In addition Penicillamine is used in those cases of primary biliary cirrhosis with a high liver copper (Hunt et al 1963) in the hope that this may minimise the secondary toxic effects of this metal.

2. Portal Systemic Encephalopathy

Mental abnormalities have long been associated with liver diseases and these are largely due to a combination of impaired liver function and abnormal portal systemic communications. No consistent abnormalities have been demonstrated to account for the neuropsychiatric disturbances, but the preceding circumstances permit ready access to the brain of nitrogenous products from the large bowel such as ammonia and indole. These have a deleterious effect on brain metabolism. The damaged liver may also fail to elaborate substances vital to cerebral metabolism. The blood ammonia is the most consistently abnormal biochemical parameter and often parallels clinical state and electroencephalographic abnormalities.

The range of disturbances associated with liver disease and spontaneous or surgically constructed shunts include cerebral dysfunction (mental and personality change; epilepsy), extra pyramidal and cerebellar disorders and myelopathy with paraplegia (Read et al 1967). Histological changes include increase in protoplasmic astrocytes and degeneration of nerve cells in the cortex, and a selective demyelination of the pyramidal tracts in the spinal cord (Zieve et al 1960; Victor et al 1965).

The incidence of encephalopathy following portal decompression has been variously estimated, but approximates to 19% (Grace et al 1966; McDermott et al 1968). The incidence of severe encephalopathy needing admission was 19.4% for the cirrhotic and 18.2% for the non cirrhotic patients in the present series. Because the incidence of cerebral dysfunction seemed to be greater than the presence of overt neurological abnormalities a modification of the Reitan Trail Making Test (Reitan 1955 and 1958) was developed as a quantitative objective assessment of the mental change. The test comprised two tasks testing numerical and spatial orientation (Fig. 4), and the patient was timed joining up the numbers sequentially (Part A) and the numbers and letters alternately in the correct sequence (Part B).

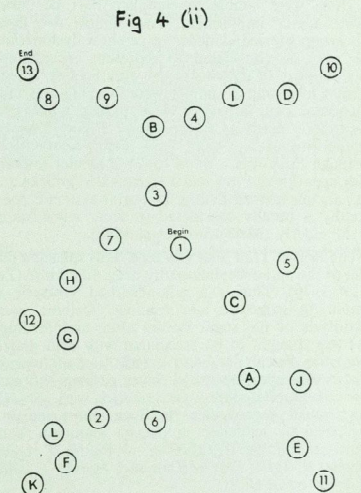
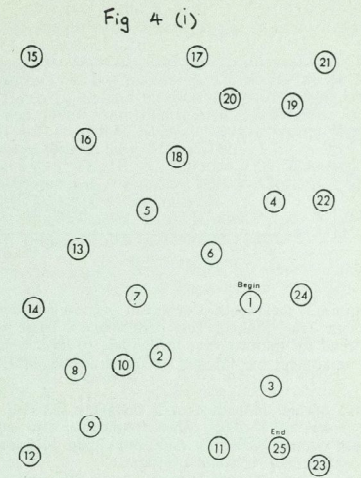


FIGURE 4. The Reitan Trail Making Test. (i) Part A. The patient was timed joining up first the numbers (ii) Part B and then the numbers and letters alternately in the correct sequence. The *Journal* gratefully acknowledges permission from *The B.M.J.* to use the above figure.

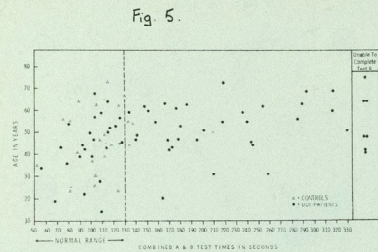


FIGURE 5. Relationship of age of patients and controls with Trail Making Test performance. There was a trend for patients over forty years to have a greater impairment but this did not reach significance.

Most normal individuals will complete the two parts in under 130 seconds, whereas patients with organic brain damage generally take more than 130 seconds, although there is some overlap.

When sixty-four outpatients with porta-caval anastomoses were examined 62.5% (forty) gave abnormal results for the Trail Test (Zeegen et al 1970). Seven of these were unable to complete Part B, indicating severe mental impairment. Thus almost two thirds of this group showed evidence of cerebral dysfunction and this may be considered to represent encephalopathy. The majority of patients tested were leading apparently normal lives, and a number were working and thus the full sociological impact of these findings is obscure and is currently receiving further study. Figure 5 shows the comparison of age with Trail Test performance and although there was a trend towards greater impairment with age, this did not reach statistical significance. This was an unexpected finding as portal systemic encephalopathy is usually considered to occur more frequently in the elderly (McDermott et al 1968).

The Reitan Trail Test was used daily during a clinical trial of the anti-encephalopathy drug, Lactulose (Zeegen et al 1970). This is a non-absorbed synthetic sugar containing galactose and fructose. Colonic bacterial hydrolysis of the sugar occurs after oral feeding and this was thought to be associated with acid diarrhoea, change in faecal flora and a reduction of toxic nitrogenous substances absorbed. Seven patients with marked chronic encephalopathy were treated, with clinical and biochemical improvement in three. Improvement was paralleled by reduction in plasma ammonia, and improvement in the EEGs. (Fig. 6) Figure 7 shows the change of Trail Test performance during a complete study in one patient.

Although no clear mechanism was demonstrated it was conclusively shown that improvement was not simply the result of purgation as deterioration promptly occurred when Magnesium Sulphate solution was substituted to produce an identical purge. Some evidence exists that the beneficial effect of Lactulose may be due to a depression of colonic ammonia absorption when the stool pH is lowered (Bircher et al 1968).

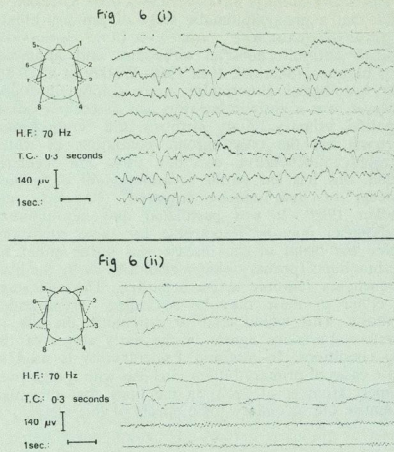


FIGURE 6. (i) EEG tracing of patient with severe portal systemic encephalopathy and raised arterial ammonia levels. The typical slow wave abnormality is very marked. (ii) Considerable improvement in tracing after treatment with Lactulose.

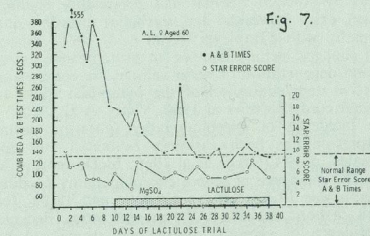


FIGURE 7. Changes in the results of psychometric testing in a patient during Lactulose trial. The upper line represents combined A and B test times, showing a return to normal values only on Lactulose. Lower line shows variation in a less sensitive measure—a score applied to the construction of a five star. This is frequently impaired in hepatic encephalopathy.

It was concluded that while Lactulose should be considered useful in the treatment of hepatic encephalopathy, it does not replace Neomycin which is cheaper. It may, however, provide a useful alternative to Neomycin in certain patients especially where long term therapy is needed. Thus far no severe side effects of Lactulose have been documented. When, however, more is known of the genesis of encephalopathy, more efficacious treatment will doubtless be developed.

REFERENCES

- BASU, A. K., BOYER, J., BHATTACHARYA, R., BASU MALLIK, K. C., SEN GUPTA, K. P. (1967) Non cirrhotic portal fibrosis with portal hypertension, a new syndrome. Part I. Clinical and Function Studies and Results of Operations. *Ind. J. Med. Res.* 55, 336-250.
- BIRCHER, J., LARGIADER, F., HAEMMERLI, U. P. (1969) Effect of Lactulose on Absorption and nonionic diffusion of ammonia in the Colon. Symposium on Lactulose. Baden, Austria. 8th September (To be published).
- COHN, R. and BLAISDELL, F. W. (1958) The natural history of the patient with cirrhosis of the liver with oesophageal varices following the first massive haemorrhage. *Surg. Gynaec. Obstet.* 106, 699-701.
- CONN, H. O., and LINDENMUTH, W. W., (1965) Prophylactic Porta-Caval Anastomosis in Cirrhotic Patients with Oesophageal Varices. *NeW Eng. J. Med.* 272, 1255-1263.
- DONIACH, D., and WALKER, J. G. (1969) A unified concept of Autoimmune hepatitis. *Lancet* i 813-815.
- GRACE, N. D., MUECH, H., CHAMERS, T. C. (1966) The present status of shunts for Portal Hypertension in Cirrhosis. *Gastroenterology* 50, 684-691.
- HISLOP, I. G., WATERS, T. E., KELLOCK, T. D., SWYNNERTON, B. (1966) The natural history of Haemorrhage from Oesophageal Varices. *Lancet* i 945-948.
- HUNT, A. H. (1958) A contribution to the study of portal hypertension. Livingstone, Edinburgh.
- _____, PARR, R. M., TAYLOR, D. M., TROTT, N. G. (1963) Relation between Cirrhosis and Trace Metal Content of Liver with special reference to Primary Biliary Cirrhosis and Copper. *Br. Med. J.* ii 1498-1501.
- IMANAGA, H., YAMAMOTO, S. and KUROYANAGI, Y. (1962) Surgical treatment of portal hypertension according to state of intrahepatic circulation. *Ann. Surg.* 155, 42-50.
- MCDERMOTT, W. V., BARNES, B. A., NARDI, G. L., ACKROYD, F. W. (1968) Post Shunt Encephalopathy. *Surgery Gynaec. Obstet.* 126, 585-590.
- MIKKELSEN, W. P., EDMONSON, H. A., PETERS, R. L., REDEKER, A. G. and REYUOLDS, T. B. (1965) Extra and intrahepatic portal hypertension without cirrhosis (hepato-portal sclerosis) *Ann. Surg.* 162, 602-620.
- READ, A. E., SHERLOCK, S., LAIDLAW, J., WALKER, J. G. (1967) The neuropsychiatric syndromes associated with chronic Liver Disease of an extensive Portal Systemic Collateral Circulation. *Quart. J. Med.* 36, 135-150.
- REITAN, R. M. (1955) Relation of Trail Making Test to organic brain damage. *J. Consult. Psychol.* 19, 292-294.
- _____, (1958) Validity of Trail Making Test as an indicator of organic brain damage. *Percept. Mot. Skills* 8, 271-276.
- RESNICK, R. H., CHALMERS, T. C., ISHIHARA, A. M., GARCEAU, A. J., CALLOW, A. D., SCHIMMEL, E. M., O'HARA, E. T., and the Boston Inter-Hospital Liver Group. (1969) *Ann Intern. Med.* 70, 675-688.
- SHERLOCK, S. (1964) Haematemesis in portal hypertension. *Brit. J. Surg.* 51, 746-749.
- SHERLOCK, S., FOX, R. A., SCHEUER, P. J., DONIACH, D. Pre-symptomatic Primary Biliary Cirrhosis (Abs.) 1969 *Gastroenterology* 56, 1222.
- STONE, W. D., ISLAM, N. R. K. and PATON, A. (1968) The natural history of cirrhosis. *Quart. J. Med.* 37, 119-132.
- VICTOR, M., ADAMS, R. D., COLE, M. (1965) Acquired Chronic Hepatocerebral Degeneration. *Medicine* 44, 345-396.
- WALKER, J. G., DONIACH, D., and DONIACH, I. (1970) Mitochondrial antibodies and Subclinical Liver Disease. *Quart. J. Med.* 39, 31-48.
- ZEEGEN, R., DRINKWATER, J. E. and DAWSON, A. M. (1970) A method for measuring cerebral dysfunction in patients with liver disease. *Br Med J.* (In press).
- _____, DRINKWATER, J. E., FENTON, J. C. B., VINCE, A. and DAWSON, A. M. (1970) Some observations on the effects of treatment with lactulose in patients with chronic hepatic encephalopathy. *Quart. J. Med.* (In press).
- _____, STANSFELD, A. G., DAWSON, A. M. and HUNT, A. H. (1969) Portal hypertension as the presenting feature in primary biliary cirrhosis. *Lancet* ii, 9-13.
- _____, STANSFELD, A. G., DAWSON, A. M. and HUNT, A. H. (1970) Prolonged Survival in patients with Intrahepatic Portal Hypertension following portal decompression. *Gut.* (In press).
- ZIEVE, L., MENDELSON, D. F., and GOLPERT, M. (1960) Shunt Encephalopathy. Occurrence of permanent myelopathy. *Ann Intern. Med.* 53, 53-63.

Answers: Both these cases of chest T.B. have been treated by plompage—the insertion in the thoracic cavity of an inert bulky material in order to collapse and rest the lung. The cavitated appearance at A is in fact due to the use of hollow Lencite balls for this purpose; these were suspended by a sponge of Forman having the same action, which is shown at B. In I there is also a pneumothorax present. This is artificially produced, the rationale being that women with T.B. had been shown to improve during pregnancy. The diaphragm being raised and presumably "resting" the lung.

Spot the Lesion

Obstetrical Problems in Practice

By A. N. Crowther

Anyone who is in the least bit interested in Obstetrics will at some time read Prof. Ian Donald's Practical Obstetric Problems. I did—with mixed feelings of fascination and horror, and in the white coat comfort of an N.H.S. housejob, with echelons of senior staff to sort out the "problems". But there is a world of difference between theory and practice. And there is nothing better than practice to fire one's interest, while conversely there is a considerable danger of boredom if one sticks to theory. It was while I was completing a year's stay in Africa by doing a holiday locum in a Northern Malawi hospital that the following cases turned up. The wide range of clinical problems they illustrate, though perhaps not unusual for Africa, prompts me to record them purely for interest's sake.

In an African practice, there are "Tropical" diseases which are confined to these regions, but the majority of patients suffer from the same illnesses as those found in Bow and Clerkenwell, although the African variety tends to be more virulent, and often more bizarre than the English. In a very short time one will see many cases of the so-called "small print" diseases, such as anthrax, Pott's disease of the spine, psosas abscess, Helminthic intestinal obstruction, measles encephalopathy—but in this paper, attention is focussed on Obstetrical problems.

A sparse population scattered over a large area of untamed bush inevitably leads to problems of transport and communications. But such a problem can at times be a blessing in disguise. A young gravida 2 sought help at 28 weeks because of painless bleeding, but as is so often the case in Africa, she only had enough courage to attend Outpatients and she refused admission. She turned up at a different hospital at 34 weeks bleeding heavily, and having irregular contractions. No foetal heart sounds were heard. Resuscitative measures were started but since there was no doctor at this hospital she was put aboard a Land Rover, still bleeding, for the 30 miles journey over dirt roads to us. On arrival the bleeding appeared to have stopped, and her general condition was good, although no foetal heart was heard. So she was taken to theatre for examination, which revealed a type 4 placenta praevia, with the os four fingers dilated. In this part of Africa, delivery by Caesarian Section is regarded as a failure of motherhood, even with a live baby, and consequently only agreed to when there is no alternative. The vaginal examination had produced virtually no further bleeding, so the placenta was rapidly stripped from the left side of the lower segment, the membranes ruptured, and a foot brought down. The breech extraction proceeded well as far as the shoulders, but the head held fast in the partially dilated cervix, which was still half filled with the placenta. Luckily she was multiparous and with firm traction, both foetus and placenta were delivered successfully, and the patient made a good recovery. Whether the bumpy journey was a decisive factor in stopping the bleeding is a matter for conjecture,

but a similar case makes one wonder. Some time later we received a girl who had bled heavily at 28 weeks and had to be driven 15 miles to us over rough roads. On arrival she delivered the gestational sac complete and intact, placenta first, with no blood loss!

Medicine in Africa is always enlivened by competition with the "witch doctors". There are still some practitioners in the art of African medicine and mysticism, but most of the "muti" paste (smeared on a baby's fontanelle to release evil spirits) and skin marking (a form of acupuncture) is applied by the village grandmothers (go-gos). They concoct their brews according to age old recipes and while most of the recipes are quite harmless, or even mildly therapeutic (if only psychotherapeutic) there are some patients who are made ill by the "medicines". There is thus a great danger in wrongly blaming native medicines for mild or bizarre symptoms, a prejudice which is well illustrated in the following case.

Each patient brings with her a helper, who prepares her food and attends to her needs. When a gravida 4 who had been in good labour for eight hours, went out of labour and became a bit sleepy early one morning, the midwives thought that her helper had given her some medicine, and the fact was not reported. Some hours later, just as we were about to start a laparotomy on another patient, I was called to see her because her abdomen was distending. On examination, her general condition was good, but she was a little sleepy, and the whole of her abdomen was distended, tympanitic, and silent, but no tender. Since there was no signs of labour, no signs of foetal distress, and she was only two fingers dilated, we decided on a Caesarian Section after the laparotomy, which was already on the table. While the Syles tube was being passed, she vomited large amounts of green fluid, which was generally agreed to be native medicine, and the fact was again not reported. At laparotomy however, she was found to have paralytic ileus and a lower segment uterine rupture cavity. The child by this time was grossly anoxic and failed to breathe, while the mother's condition was very poor. The bleeding could only be controlled by undertaking a subtotal hysterectomy, which was too much for her, and she died. Native medicine had been so much to the fore in the midwife's mind that she had failed to recognise the bile stained vomit of intestinal obstruction.

The same village go-gos mentioned earlier act as midwives to the village, and are well known to use the most brutal methods to achieve their end. I was never lucky enough to see them in action, but I was presented at 7 a.m. one morning with a 19 year old with a traumatic procedentia. She had been delivered by the go-gos at midnight after several hours of struggle, and the baby, remarkably, seemed none the worse for the experience. But the mother's totally everted vagina was ulcerated, oedematous, and capped

with a purple cervix. Under Pethidine sedation, the puffy mass was cleaned and reduced by gentle pressure until it slipped back. She was given a course of Penicillin, and when examined a week later both vagina and cervix looked quite normal, and the uterus, which was involuting well, did not appear unduly mobile.

A single handed practice is very interesting in that one does see and have to cope with absolutely everything that turns up. It does have its disadvantages however, such as the morning when, while dealing with a footling breech with a prolapsed cord, I was calmly informed by a midwife that she had an obstructed second twin next door. The African girls have a genius for ignoring the difference between the normal and the abnormal! But there is always the satisfaction of having live infants out of these situations when one follows the rules. When one fails to obey the rules, however, one must learn to expect the consequences—and cope with them, as the following case underlines only too clearly.

I had been told the interesting story of one girl who had become pregnant under quite extraordinary circumstances. She had taken two pregnancies to term, but both had been stillborn. She had turned up at hospital for the first time some four years previously with an acute abdomen, and at laparotomy was found to have a ruptured left tubal pregnancy, which had required a salpingo-oophorectomy. The specimen was luckily sent for histology, and she was found to have a heavy infection of Schistosoma mansoni (Bilharzia) in the Fallopian Tube. Following an uneventful recovery, she complained of inability to conceive, and persistent pains in the right iliac fossa. Various treatments failed to help her, and the pain became bad enough for her to submit to a second laparotomy. At this operation the right Fallopian Tube was found to be very unhealthy throughout its whole length, and a salpingectomy was carried out, leaving the ovary but making no attempt to create a stoma into the uterus. This cured the pain, and when she next appeared, she was very well and announced that she was sure that she was pregnant again. Despite medical incredulity, the patient knew best, and the pregnancy continued until 36 weeks, when she was admitted with leaking membranes and a few irregular contractions. P.V. examination on admission revealed a tight os and long cervix so she was sedated well. The foetus was rather small, so we decided to hold on as long as possible. But unfortunately, a verbal order for antibiotic cover was neither carried out nor followed up and recorded.

On the evening of the seventh day after admission, she had a slight temperature, and was started on anti-malarial treatment. By morning the fever was no better, and she was complaining of dysuria and lower abdominal pain, so she was started on Penicillin. By the following morning she was becoming toxic, the fever had risen to 102°, the uterus was tense and tender, there was an offensive vaginal discharge and both foetal heart sounds and movements had disappeared. Streptomycin was added to the Penicillin. There could only have been one logical progression down this chapter of tragedies, and at noon that day she had a pulmonary embolus. Our only Heparin was well out of date, which solved the problem of whether to anticoagulate, so she was given oxygen, morphia, digoxin and aminophylline, and she maintained her status quo adequately. At 6 p.m. she delivered a small,

macerated foetus, but the placenta refused to come away. She was far too ill for us to do anything about it at that time, so Syntocinon was added to the drip, and we waited for developments. Even the uneducated grandmothers knew the dangers of a retained placenta, and expressed their concern that we were doing nothing about it! Mercifully, after a night's rest she appeared to be very much improved, but a further attempt to remove the placenta only resulted in pulling the cord off. So with fear and trepidation she was sedated heavily, and a manual removal attempted, but she had to be given Pentothal, and finally Amyl Nitrite before there was enough room to get a hand into the uterus to prise the adherent placenta free. After this final insult she never looked back, and three weeks later was fit for discharge. As she left she requested sterilisation because she did not want to go through all that trouble again! Nor did I.

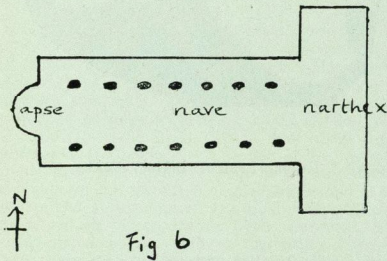
With specialisation such a marked feature of medicine in the developed countries, one has to go to developing countries to be able to practice all branches of medicine freely. But it is these same developing countries that have such a shortage of doctors, and have to rely so heavily on Medical Assistants. These men and women receive a two year training in diagnosis and treatment, and after a preregistration year in their teaching hospital, are sent out to hospitals where they are second only to the doctor, if there is one, or to dispensaries where they are in sole charge. On the whole they cope with their daunting task very well, but every so often one is rudely reminded how superficial their training really is. Which brings me to the last, and probably most fascinating case.

To have only three surviving children from ten pregnancies is not abnormal in Africa, so that when our patient became pregnant for the eleventh time, she never even considered attending the antenatal clinic. She went into labour at term, but when the contractions stopped abruptly in the early hours of the morning, she and the go-gos decided that something was wrong. They packed a few belongings, and walked six miles to the nearest hospital, arriving at 7 a.m. one Thursday morning. There was no doctor at this hospital, but the Medical Assistant examined her, and found her in no pain, without contractions, the head still high, and the os nearly fully dilated. There was no shock, and no sign of vaginal bleeding. By midday, she still showed no contractions but the cervix had thinned, and the presenting vertex had advanced slightly. So the M.A., who was a very experienced man, decided that she ought to be delivered, and using the ventouse, which "slipped off several times", he managed to deliver a stillborn infant. The placenta came away easily, with minimal blood loss, but was "followed by the greater omentum". At this point he confessed himself puzzled as to how the omentum might have come to be found in the vagina. But since it seemed to disappear when pushed back, he packed the vagina, and made the patient "lie prone strictly all the time". On the Saturday the pack was removed, but since the omentum still appeared in the vagina, he thought she ought to see a doctor. The patient agreed to the transfer, and while transport was being arranged, she took herself quarter of a mile down to the lakeshore for a bath.

On arrival with us, she seemed very well, although her abdomen was slightly distended, and tympanitic,

Guildhall Museum) and two imaginative reconstructions of what the Temple looked like. Go out through the further door into Temple Court, overlooking Queen Victoria Street, and there you will find the Temple, removed from its original site and reconstructed. The original earth floor has been replaced by crazy paving and it looks rather pathetic, with the modern office building towering above it (Fig. 5—Mithras).

Mithras was a Persian god, whose worship was spread through the Roman empire mainly by the army. Mithraism was a "mystery", that is a secret, religion, confined to men only, and it appealed to the legions because it laid stress on truthfulness and courage. There were seven "grades" of worshippers, into which men were initiated by horrifying rites. Mithras was regarded as a Saviour God, who had brought life into the world by slaying a wild bull. He was worshipped at a communion meal of bread and wine, which Christians regarded as a diabolical mockery of their own sacrament (one of the Mithraic temples on Hadrian's Wall was deliberately desecrated not long before the Romans left Britain, probably by a Christian commanded) Fig. 6).



Unlike the usual Classical temple, which was simply looked on as the home of a god, in which his statue was kept, this "basilica" type of church was meant for secret worship. It is a temple "turned inside out", with the columns inside, surrounded by a solid wall. It was of course the model for the early Christian Church.

From the Temple of Mithras, make your way down Walbrook to Cannon Street Station, which covers part of the site of the Roman governor's palace by the river (at least this is the guess that has been made—it was clearly some large and important public building, and if only it were possible to excavate under the station, the mystery might be solved). But whatever lies beneath the station, nothing can be seen now, so continue to Lower Thames Street, where a Roman public baths has been discovered. It has been covered over to protect it from the weather, but you can still catch a glimpse of the "hypocaust", which provided the underfloor central heating (permission to visit it can be got from the keeper of the Guildhall Museum).



FIGURE 5. Head of Mithras, Mithras Temple, Walbrook.

You can finish your walk by cutting up St. Dunstan's Hill to Great Tower Street, which will take you to the Tower. If you have time, call in at the ancient church of All Hallows Barking-by-the-Tower, where the verger will probably be willing, provided you come between 2 and 4 p.m. to take you down to the crypt. Down below are various things found on this site, including a Roman mosaic floor, still in its original position; there is also a model of Roman London (Fig. 7—Wall in Wakefield Gardens).

But before you go to the underground station and catch the Circle Line back to the Barbican, do go to Wakefield Gardens, opposite the Tower, where the most impressive of all the sections of the city wall stands. Almost all the wall above the modern street level is mediaeval, but the Roman wall below can be clearly seen, because the cellars of bombed buildings have been cleared to make a sunken garden. The bonding-courses of red tiles show clearly the Roman origin of the wall.

Also to be found in this pleasant garden are the nineteenth century cast of a Roman emperor (nothing to do with Roman London, but he lends a dignified air) and a copy of a Roman gravestone, which was found broken into two pieces and used as part of the city wall. One part was found in 1852, and the other in 1935, and they have now been joined together again and placed in



FIGURE 7. Wall. St. Alphages Gardens.

the British Museum. "Dis Manibus"—the inscription begins, "To the Immortal Shades". The gravestone is of great historical interest, because the dead man, Classiannus, was Procurator of the Province of Britain immediately after the rebellion of Boudicca, or Boadicea in 61 A.D. He felt sympathy for the unhappy provincials, realising they had been exploited by greedy tax-collectors, and wrote to the emperor Nero begging him not to exact too heavy a vengeance, and Nero, that wicked emperor, listened to his prayer.

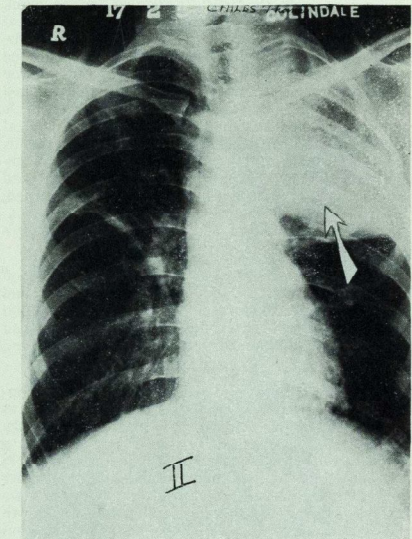
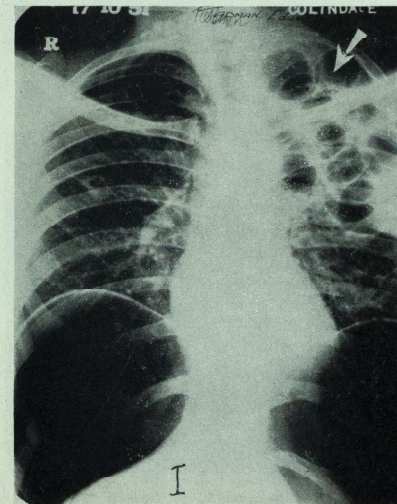
* Figures 3 and 5 are shown by kind permission of the Guild Museum.

Spot The Lesion

By N. J. C. Snell

Two plates of mainly historical interest this month. These films show two varieties of an outmoded form of treatment for tuberculosis of the lung.

- (1) What do the arrows indicate on the two plates? What is the reason for the presence of these appearances?
- (2) What other condition is present on plate I, and why?



ANSWER page 209

Medical Illustration

By Peter Cull, F.M.A., A.I.M.B.I.
and David Tredinnick, F.R.P.S., A.I.M.B.I.,
Department of Medical Illustration, St. Bartholomew's
Hospital

Introduction

The character of Medical Illustration has changed considerably over the centuries. There have been many advances in the technology of picture making and the service area has broadened, but it is doubtful if the technical skill and analytical abilities of the early medical illustrators have been improved upon. This fact is only too obvious when one remembers that the foundations of true medical illustration were laid by Leonardo da Vinci and subsequent artists such as Jan van Calcar who illustrated the "De Humani Corpori Fabrica" of Andrea Vesalius in 1543, Jan Wandelaar (1747), Charles Bell and in more recent times Max Brödel maintained the high traditions, but never really surpassed them.

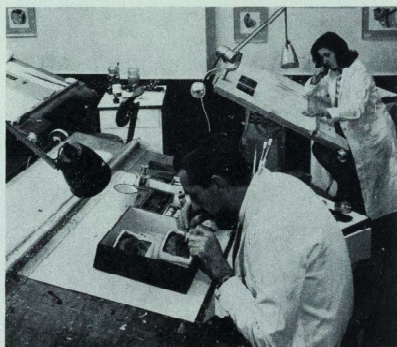
In earlier times the artists work was, in the main, confined to anatomical illustration, drawing of surgical procedures and the recording of clinical and pathological appearances. This position remained until the middle of the 19th Century when photography came on the scene and was within a very short time applied to the field of illustration in medicine. Again it is interesting to note that the quality of the early clinical photographs, despite the somewhat bizarre backgrounds against which patients were portrayed, was exceedingly high and although the introduction of improved and new photographic emulsions, colour etc. has broadened, eased and speeded the medical photographer's work, technically they compare very favourably with today's illustrations.

Photography provided medicine with a fast method of recording which was infinitely more accurate and independent of the inborn gift of the artist and within a very short time after its introduction of pictures had been successfully obtained through the microscope and of the interior of the eye and bladder.

It might have been expected that the rapid development of photography as a major illustrative medium in medicine would have eventually led to the redundancy of the Medical Artist. It was clear however that a considerable proportion of the illustration needed in medicine is based on interpretation and selectivity rather than accurate recording. Anatomy and Surgery are two obvious cases in point and, in addition, with the growth of scientific knowledge came the need for the conceptual and explanatory illustration—thus the advent of photography as well as opening the gate to a massive field of clinical and pathological recording and providing the basic technology upon which is founded the modern visual communication aids such as the film, lantern slide and film strip, also gave the stimulus to a great expansion in the use of all forms of illustration in medicine, artistic, photographic and in recent times, television and the audio-visual aids.



Medical Photography ninety years ago. 'Contracture Hysterique' from the collection of Hospital of the Salpêtrière Paris 1881.



Part of the main studio in the art section of the Department of Medical Illustration.

It is odd that despite the artist and photographer in medicine having common aims their disciplines progressed and developed independently. St. Bartholomew's Hospital and Medical College was relatively late in setting up illustration services for it was not until 1948 that a department of medical photography was instituted and the first medical artist was appointed by the Medical College in 1960. It was however among the first, if not the first to integrate the two basic services into a single department of medical illustration. Initiated by Mr. Denis Ellison Nash during his term of office as Dean of the Medical College it has developed to become one of the largest and best in the country, providing a wide variety of services to both the Hospital and Medical College and this is in no small measure attributable to the degree of internal co-operation which exists. It has played a major role in the development of some of the new teaching media and was responsible for the proposals which led to the formation of the Institute of Medical and Biological Illustration.

Medical Illustration was an almost exclusive service to the medical profession proper, in essence supplying the pictorial support for lectures, and published works—nowadays it extends beyond these boundaries and in addition provides for the graphic and photographic needs of all allied professions as well as being responsible for Educational Technology in Medicine.

Photography

To quote the Ministry of Health—"Photography in medicine is used as a means of permanently recording the condition of the patient at the time of examination and as an objective check on subsequent progress and response to treatment. This method of recording is often more precise and valuable than a verbal description. It may be employed as an aid to diagnosis, for recording purposes, for teaching and for research"

This definition is a good one in that it covers the basic purpose of medical photography particularly in non-teaching hospitals where the bulk of the work lies in the field of clinical recording, but in large central teaching hospitals the amount and complexity of work for teaching and research purposes is likely to equal or exceed the clinical recording side.

The department at Bart's has three Medical Photographers, two trainees, a photographic printer and a junior assistant, and they produce some 26,000 photographs in the year, about 60% of which are colour photographs. The range of work involves the use of Infra-red and ultraviolet radiations, fluorescence photography, cinephotography, time lapse and high speed photography as well as the full range of conventional techniques.

The Medical Photographer has to be an expert technician and his training is quite complex and demanding, but in addition, if he is to produce pictures that are to be of real value he must have a basic knowledge of anatomy, the signs and symptoms of disease, terminology, current medical and surgical practice and most important of all a sympathy with and desire to help the patient. His training will take four years, the first two being concerned purely with general photography, probably at a Technical College, and the latter two as a trainee in a hospital department.

In the photograph taken for clinical recording,



Xanthelasma. The plaques which are poorly shown in the top photograph taken by 'visible' light are much better demonstrated by infra-red.



Xanthoma. Strong side lighting and the close up view help to make this a suitable photograph for teaching or publication.



Pre-Patellar Bursa. A straight clinical recording requiring standardization of viewpoint and lighting.

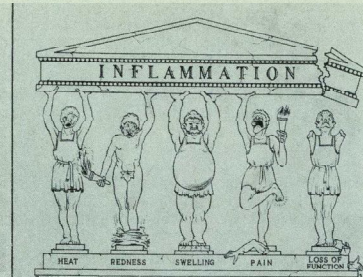
standardisation of view point scale and lighting is aimed at as far as possible in order to make the result comparable with subsequent serial photographs taken during the patient's progress. A copy of each view is kept in the department for reference by the photographer and over the years this collection of photographs has become a very valuable source of illustrative teaching material.

Where a photograph is originally requested for teaching purposes the photographer can use his control of lighting technique and choice of view point to show the condition rather more dramatically and in a number of cases the use of the infra-red or ultraviolet wave bands can provide a useful demonstration of a condition which is poorly shown by conventional visible spectrum photography. The best known example is the delineation of superficial veins by infra-red photography, but there are many other occasions when its use or the use of ultraviolet can be of advantage.

The daily routine of recording patients is the bread and butter of the Medical Photographer together with the photography of pathological specimens, the reproduction of radiographs and a vast amount of general purpose photography.

In the last ten years the emphasis has moved towards the side of teaching and research. There has been a vast increase in the use made of colour illustrations particularly in the form of transparency slides for projection where the reproduction of colour values is now really acceptable. The medical profession, while having been quick to accept and use photography in a clinical setting has not always made full use of the results as an aid to teaching, even photographic reproductions in medical text books have in the past been of poor quality and still often are in many of the journals.

Cine films too are made in great numbers and have a great potential for both undergraduate and graduate education, but are often made for a different purpose, usually the portrayal of a surgical technique and because of this or due to financial stringency have to be made for too general an audience and in consequence are rejected by the specialists. Nevertheless there are very many first class films available on loan or on hire and the department can always help in obtaining them.



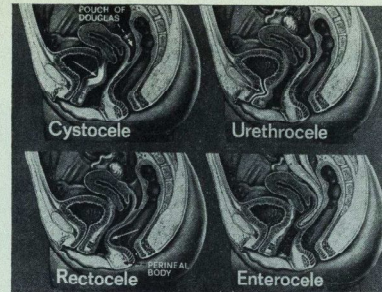
A cartoon type illustration for teaching demonstrating the features of Inflammation.

The obtaining of medical photographs is only part of the job. The other part being to endeavour to see that the best use is made of them. To this end the department keeps a massive pictorial file of medically classified photographs both as black and white prints and as a collection of colour slides. The total has reached such proportions that it has become necessary to abstract a special "teaching collection" limited to the more "usual" conditions required to undergraduate teaching. Illustration departments in other teaching hospitals have similar "libraries" and gaps in our collection can often be filled by a loan from elsewhere. The pictures now appearing monthly in this journal under the title "Physical and Radiological Diagnosis" are one of the fruits of maintaining a pictorial library.

Medical Art

Advances in photographic technology have resulted in radical changes affecting the character of Medical Art. Little now remains in the field of clinical or pathological recording, the superiority in speed and accuracy of the camera makes it the method of choice. Two of the original facets of Medical Art which remain unaffected and will continue so are anatomical and surgical illustration, because in the main they demand a selective interpretive approach based more on an intimate knowledge of structures and technique, than on simple ability to record what is visibly obvious; illustrations of these subjects are unobtainable by means other than drawing. Medical Artists generally have tended to rechannel their skills into more dynamic fields with the result that medical art has broadened tremendously in scope and through the medium of illustrations for text books, journals and pamphlets, animation sequences for film and television, by means of realistic and explanatory models, lantern slides, film strips, wall charts and teaching exhibitions the work of the Medical Artist has developed as a technique for communicating information and ideas rather than the recording of the visible tangible object.

Thus it is obvious that the modern medical artist needs to be more than a competent draughtsman. The



Drawings of the four basic types of prolapse in the female genital tract from a tape-slide programme.

present six year training programme comprising four years pure art and two specialising in the medical application is barely sufficient to give more than a grounding in the profession. As well as a sound knowledge of anatomy and physiology, and at least a basic understanding of disease processes, medicine and surgery, there are many technical aspects to assimilate such as a knowledge of printing and reproduction methods, typography, script writing, motion picture and television production. Furthermore the artist needs to acquaint himself with educational methods in order to give a proper service in medical teaching.

The art section of the Department of Medical Illustration at St. Bartholomew's Hospital has a staff of five, three of whom are qualified medical artists and the remaining two are Chartists. These latter are responsible for the production of various forms of graphic presentation of scientific and statistical data, the bulk of which is associated with various ongoing research projects and represent a not inconsiderable proportion of the department's work.

Although all the staff artists are engaged in the various aspects of illustration previously described they are becoming increasingly involved in all aspects of medical and paramedical teaching, one artist, in fact, is solely engaged on the production of illustrations for tape-slide programmes associated with the self-instruction methods now being developed.

The Future

Since 1961 the department has expanded greatly—not only in the quantity of output but also in the variety of communication media involved. On the hospital side these now include the production of instructions, information and public relations booklets, charts and posters such as the Patient's Handbook and the Emergency First Aid posters. These latter are also sold in some number outside the hospital, have been trans-



The Bart's Desk; an audio visual teaching unit designed for presentation of automated tape-slide programmes.

lated into Swahili and Vietnamese and are on the walls in such unlikely places as the House of Lords and the Dublin Fire Brigade.

On the college side the greatest single development has been the production of audio-visual aids for teaching, particularly in the form of self-instruction programmes. These are also produced for Hospital staff and the School of Nursing, but the major portion are for undergraduate teaching. A small audio-visual unit has been established at St. Leonard's Hospital making use of tape-slide programmes shown on the Bart's desk which was designed in the department and built by the college workshops. For each of these programmes a script is written and recorded by the teacher concerned with assistance from the Department who then "produce" the finished programme including all the illustrative content. An average programme will last for about 15-20 minutes and have between 20 and 40 illustrations. Plans for a larger unit to be established in the Hospital area and to form a centre for all forms of Audio Visual teaching including Television are under consideration and if these plans are accepted the Department of Illustration is going to be heavily involved in providing production facilities and programme material.

In these ways and in many others the role of the Illustration Department has expanded from that of technical producer of pictures to that of collaborators and advisers in the use of those illustrations in the clinical, teaching and the research fields.

SPORT

BOAT CLUB REPORT

	CREW	4th	5th	6th
Div. I	1. St. Mary's I			
	2. St. Thomas's I			
	3. Guy's I			
	4. St. Bartholomew's I			
	5. Westminster I			
	6. Guy's II			
	7. St. Bartholomew's II			
	8. London			
	9. St. Thomas's II			
	10. St. Mary's II			
	11. Westminster II			
	12. St. Bartholomew's III			
Div. II	13. Royal Vets I			
	14. Guy's III			
	15. St. Thomas's III			
	16. St. Thomas's IV			
	17. Middlesex			
	18. St. Bartholomew's IV			
	19. St. George's			
	20. St. Bartholomew's V			
	21. Royal Dental			
	22. St. Thomas's V			
	23. Royal Vets II			
	24. Guy's IV			
	25. Guy's V			
	26. St. Bartholomew's VI			
	27. St. Thomas's VI			

United Hospitals Bumping Races, May 4th, 5th and 6th.

This event was organised by Bart's this year, and (sheer coincidence) we competed in it with great success.

Six eights were assembled; the first and second crews had been training hard for these races, the third eight consisted of medically qualified gentlemen (old lags), the fourth eight of 2nd M.B. men and finalists, and two rugger boats completed our entry.

The first eight rowed over the first night, but went all out on the second night to catch Guy's at the barges, and so revenge themselves for last year. The second eight again excelled themselves, bumping Guy's II on the first evening and the London the next night. Unfortunately success went to their heads and they allowed the London to bump them back on the last night—too late to prevent them from being awarded the Second Eights pennant, which thus returns to Bart's after an absence of just one year. The third and fourth crews both rowed splendidly to make two bumps and three bumps respectively. The fifth eight were enthusiastic, but their descent was alas as regular as their attendance; on the last night they were in fact caught by the sixth eight, who had acquitted themselves nobly throughout. In all, probably our most successful (and certainly the most enjoyable) Bumps, for several years.

Ul Allom Cup Regatta, May 9th.

The first and second eights, and three scullers, composed our entry for this event. The first eight, rowing for the Allom cup itself, managed to have the U.C.H. crew disqualified in the first round, then lost to Guy's, all out to avenge the bump we had made on them, by a canvas. The second eight, however, reversed



The junior eight competing in the Tideway Head of the River Race last March.

Crew: T. Hunt, M. Erith, M. Harford-Cross, S. Whiting, J. Johnson, J. Lambley, A. Gray, T. Coyle, P. Smyth (cox).

this result in the final of the Junior eights event by beating the Guy's 2nd VIII handsomely, having already beaten I.C. in a heat. Two of our scullers were forced to scratch since they were doubling up, but J. Close did well to reach the final, where he was unlucky to be beaten. An unexpected share in another trophy came our way when S. Scott won the university coxless pairs with N. Press of Imperial College.

N. J. C. SNELL.

RUGBY CLUB

Bart's Welsh Tour, 1970, 27th & 28th March.

On Friday evening Bart's were supposed to play Gleneath. Due to mechanical difficulties, this fixture did not take place until Friday night. It was not perhaps immediately obvious who was in training and who wasn't, but throughout the game this to some extent became more apparent. McIntyre played with a brilliance which was even more marked considering the harrowing experience previous to the game. Indeed, he notched a very fine try, having been set up by Lambert, who had at one stage found himself with a great deal more room than he was used to. Carroll managed a try under the posts from that old standby move, the "Trinidad". Cassidy converted both tries and added the other three points.

Final result: Bart's 13; Gleneath 13.

Saturday Afternoon, 28th March.

Bart's lost to Treorchy 12-3, an unexpected result but one which after the first unco-ordinated five minutes was not surprising.

Tour party: N. Packer, M. May, R. Lambert, S. Smith, J. Laidlow, B. Cassidy, J. Wellingham, K. McIntyre, D. Davies, T. Fenton, M. Britton (Captain), J. Carroll, N. Fairhurst, D. Rowlands (injured both days), T. O'Kane (absent Saturday).

Bart's 1st XV v. Streatham & Croydon, 4th April.

Bart's set off in great style, who would have thought they had just endured a stamina-testing Welsh tour? But for some unfortunate misses by May, Bart's would have been 9-nil up in the first fifteen minutes. However, in the first half, due to come good loose and line-out ball (who said the Forwards couldn't jump?) Bart's managed some very enterprising attacks. Lambert, ably supported by Rutter and Rhys-Evans, kicked and ran well. The first half saw a good try by Britton, having been set up by McIntyre, after Lambert kicked ahead and re-took for the break. A further try was by Laidlow after a breakdown in one of Bart's assaults on the Streatham line. At half-time we were deservedly leading 10-nil. The inspiration in the second half was taken up by Wellingham, who made some exciting breaks. There was good running also by the Forwards. Streatham managed a second half penalty.

Final result: 10-3.

United Hospital's Sevens

Bart's entered two sevens for this competition which was spoilt by the absence of several of the other hospitals.

In the first round Bart's I easily disposed of Guy's II, and Bart's II had an even bigger victory over London II. Unfortunately this meant that the two Bart's sides were drawn against each other, and the second seven was persuaded to scratch. This was a big disappointment to them, as they might well have shaken several of the better sides in the competition.

Bart's I were thus in the semi-final, and played Charing Cross. After an anxious few minutes when the Charing Cross seven played with tremendous fire and enthusiasm, Bart's became a little more composed and went on to win comfortably.

In the Final against St. Mary's I, the Bart's seven never looked good. Although Bart's took the lead through a try by Keith McIntyre which was converted, St. Mary's scored twice in the second half to be 10-5 in the lead. Bart's hopes were revived when Heslip scored some way out, the kick failed, and Bart's were then kept in their own half for the remaining two minutes of the match.

Despite the opinions of *The Times* correspondent, the sevens was of a low standard throughout the day. The failure of the first team to win the cup was poor reward for the second seven and numerous Bart's supporters who had made the long trip to Enfield.

Teams:

Bart's I: M. Britton (Capt.), T. Fenton, K. McIntyre, M. Heslip, R. Lambert, J. Laidlow, S. Smith.
Bart's II: N. Fairhurst, A. Johnson, A. Mason, D. Jefferson, N. Packer, P. Rhys-Evans, M. Elliot.

Middlesex Seven-a-Sides Preliminary Rounds, 25th April.

Although missing several star players, the Bart's first team surprisingly won through to the final rounds of this competition. It was an unusual seven that achieved this feat but they combined well and played excellent seven-a-side rugby.

The team were in a relaxed, nonchalant mood in the first game, and beat Bank of England I 14-3. The second game was played in a thunderstorm, and Bart's adapted quickly to the conditions. After two early scores the team went on to beat old Colfeians I 16-0. This gave Bart's a chance to upset the well fancied London Scottish I.

This match was the highspot of the day for Bart's. Good understanding between Fenton and Lambert gave the latter a simple run-in for a try under the posts, which Fairhurst's confident boot converted. London Scottish were further shaken by splendid tackling from Laidlow and Smith, the latter came close to increasing the score shortly before half-time.

In the second half superb covering by Mason and Britton foiled the Scottish attacks, until with two minutes to go they scored half-way out. Fortunately the kick failed, and in the agonising few minutes left the Bart's defence held firm.

Now only Old Whitgiftians II lay between Bart's and Twickenham Smith's superb side-step, and Mason's strong running led to two tries between the posts, which Fairhurst again converted. In the second half the seven made sure of a place at Twickenham with three fine tries, eventually winning 19-0.

The second seven put up a very creditable display when losing 13-5 to Westcombe Park I. They tackled well, and fighting back strongly in the second half they were unlucky only to score once.

Teams:

Bart's I: M. Britton (Captain), N. Fairhurst, A. Mason, T. Fenton, R. Lambert, J. Laidlow, S. Smith.

Bart's II: A. Aiken, D. Davies, J. Scarffe, N. Packer (Captain), M. Jamieson, I. Allen, M. Elliot.

NOTE: All material for the August *Journal* should reach the Editor, TYPED, no later than 23rd June, 1970.

* Applications are invited for the post of Sport Sub-Editor as from July 1st, 1970.

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Medical Protection Society, 50, Hallam St., London, W.1.

SAINT BARTHOLOMEW'S HOSPITAL JOURNAL

Founded 1893. Vol. LXXIV No. 7

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Editorial

By the time this *Journal* is published we will have a new government; and irrespective of which party wins the election, the medical profession will be decidedly better off as a result of the recommendations of the review body.

Under the government's provisions, junior hospital staff are to get an immediate 30% rise in salary, back dated to April 1st, while consultants and G.P.'s are to have an immediate 15% increase, with a further 15% referred to the Prices and Incomes Board. This latter step is in direct opposition to the recommendations of the review body, who were in favour of a 30% rise all round. Undoubtedly anyone would agree that it is the younger doctors who at the moment have need of the money, more than the senior staff (who are already Britain's top paid public employees!). Yet this discrimination seems pointless; one unforeseen result has been to widen the breach between the junior doctors and the B.M.A., who have called for a "go-slow", and the rejection of the pay award. The J.H.D.A. have said that they are prepared to accept the rises, and will not participate in a "go-slow".

However this is resolved, we can only hope that the promise of higher pay (and perhaps a rise in medical students' grants, for which B.M.S.A. is currently campaigning) may entice some of our graduates to remain in this country where they will be sorely needed if the latest figures on Commonwealth medical staff coming over here are accurate.

Letters to the Editor

St. Bartholomew's Hospital.
May, 1970.

Dear Editor,

Over the past few months everyone in the Hospital must be aware of the rumblings of discontent permeating throughout. These grumbles, at times intense, usually relate to yet another top priority "Ministerial Package Deal".

It seems so sad, that this should be so in our previously happy community where we had earned a reputation from our patients for providing a service unsurpassed by many Hospitals. The Doctors and Nurses of "the old school" concentrated their efforts both in and out of their working hours, on getting the patient back on his feet in the most efficient manner possible. They did not waste their energies thinking of overtime, Non-nursing duties, methods of food payments, and promotion.

Tradition is often a subject of ridicule, but isn't it time that we realised that by quietly submitting to every Ministerial whim, we shall be giving up a heritage that generations of Bart's men and women have worked to achieve. No one should be against change for the better, and many of the ideas put forward are for the material advantage of patients and staff alike. However, when it seems that the majority of the Nursing and Medical staff disapprove of some of the suggestions, would it not be possible for some of the ideas to be introduced on a trial basis at first? Is it right that some Ministerial pen pusher who has little or no knowledge of how a place like Bart's functions, should be able to dictate its future?

Some of the ideas as to what constitutes a "Non-Nursing" or Nursing task appear to liken the patients to a Ford car, or the end product of a sausage machine. Following attendance at the Ministry recommended Management courses, many of the Nursing staff can report that although it was a very restful and entertaining way to spend a week at the government's expense, the end result bore little or no relationship to the art of looking after people.

Bart's has a tremendous tradition to live up to, namely—Patient first; Staff second. Shall we not try to keep the Hospital a place with which in later years we can still be proud to have associated?

Yours faithfully,

P. J. d'E. Stevens.
(Sister S.O.P.s.)

Note:

All material for the September *Journal* should reach the Editor, typed, no later than 28th July, 1970.

THE CUP MATCH

"The Gibbets", Palmerston Court,
Hove 2, Sussex.
14th May, 1970

Dear Editor,

I first became acquainted with your estimable hospital whilst being treated for a complaint not uncommon amongst sea-faring folk. It therefore distresses me not a little to surmise from the editorial of the May edition of your journal that the hospital has been infiltrated by long-haired weirdo-lefties who obviously cannot enjoy a hearty jape. The origins of these persons are undoubtedly of the working classes—none of whom I know—and their presence at Bart's sustained only by government charity. In their atheistic ignorance these persons fail to realise that the trifling sums involved in restoring Richmond Athletic Ground and Guy's Hospital cannot compare with the value of showing the Guy's chaps the stuff of which Bart's men are made. It is not too much to say that when I heard of the exploits of these much maligned lads—obviously the sons of men of certain substance—I felt a stirring in my loins of which any Englishman might be proud. Lest future japes be jeopardised through lack of finance I propose to open a fund: please send any contributions to me in the polythene containers provided.

Yours sincerely,

Vice-Admiral SID LUNGER, Rtd.
(M.C.C. "Calcutta" (failed)).

STUDENT UNION NEWS

Nominations are invited for the post of FINANCIAL SECRETARY of the Students Union Council, to take office with effect from 1st August, 1970.

A proposer and two seconders are necessary for this post and names should be handed to me by lunch-time on 3rd July.

PETER SIMPSON,
Hon. Secretary—Students' Union.

Announcements

Births

BRITTON—On April 3, to Mona (née Cowans) and Julian, a daughter (Rachel Katherine).

Deaths

ASHLEY—On May 4, Dr. Herbert Ernest Ashley, M.R.C.S., L.R.C.P. Qualified 1900.

BAISS—On May 25, Dr. Llewellyn Arnold Bais, M.R.C.S., L.R.C.P., aged 94. Qualified 1899.

EVANS—On May 20, Dr. Edward Gerald Evans, M.R.C.S., L.R.C.P. Qualified 1939.

HORDER—On April 18, Dr. Cecil Arthur Horder, F.R.C.S. Qualified 1921.

NICOL—On April 25, Dr. William Drew Nicol, M.B., B.S. F.R.C.P., D.P.M., aged 75. Qualified 1917.

SMITH—On May 19, Dr. Edward James Johnston Smith, M.R.C.S., L.R.C.P. Qualified 1929.

Appointments

Dr. A. J. Salsbury, M.D., has been appointed consultant haematologist to the Brompton Hospital, London.

Mr. H. B. Stallard, M.B.E. (Mil.), T.D. M.D., has been appointed Honorary Member of the Swedish Medical Society; an Honorary Member of the Hellenic Ophthalmological Society; and an Honorary Member of the Irish Ophthalmological Society.

Change of Address

The new address of Dr. B. J. Britton is 26 Rangers Square, Greenwich, S.E.10.
The new address of Mr. H. B. Stallard is 112 Hartley Street, London, WIN IAE.

ST. BARTHOLOMEW'S HOSPITAL

Election to the Council of The Royal College of Surgeons

On 8th April, 1970, a meeting was held of Fellows of the College who are currently working at Bart's. Mr. Ellison Nash is to apply for membership of the College Council at the forthcoming election, and it was agreed that Mr. Nash's application would receive full support as the nomination from Bart's.

Final F.R.C.S.

Day release courses will be held from 5th August to 21st October, 1970 on Wednesdays.

All enquiries to Mr. Ian McColl, M.S., F.R.C.S., Postgraduate Assistant Dean of the Medical College.

PRIZES

Brackenbury—

Surgery: Mr. N. H. Brooks.

Medicine: Mr. R. K. Knight.
Proxime accessit: Mr. K. G. Taylor.

Surgery & Burrows Prize: S. B. Sutcliffe.

Surgery & Walsham Prize: N. H. Brooks.

Matthews Duncan: J. S. M. Toms.

Proxime accessit: Mrs. Vanhegan.

Sydney Scott: S. A. Copeland.

Willott Medal: N. H. Brooks.

Skyunner Prize: Miss Huskisson.
Proxime accessit: N. Thatcher.

Weitzman Prize: J. Mackinnon.

Roxburgh Prize: Miss B. Bailin.

Pre-Clinical—Treasurer's Prize: W. B. Campbell.

Foster Prize: I. V. D. Weller.

Wix Prize: J. Tobias.

THE CITY MIGRAINE CLINIC



Princess Margaret at the opening of the City of London Migraine Clinic, May 1970.

The City Migraine Clinic was started by the Migraine Trust in May 1970. The two main objects of the clinic are to provide treatment for patients suffering from migraine and to be a centre for research into migraine. Over the years a number of migraine clinics have been started throughout the country but most of these can only be held once a week and, as there is a considerable demand for them, there is often a long waiting list before a patient can be seen.

The City Migraine Clinic was the idea of Mr. Derek Mullis who is the Chairman of the Management Committee of the Migraine Trust. He works in the city and is well aware of the problems of migraine. Because of this and because some of his family suffer from migraine he thought that a centre for the treatment of migraine should be set up in the City as approximately half a million people come there every day to work and because it seemed probable that under City conditions a large number would be likely to develop headaches while at work.

The majority of patients coming to the clinic are referred by their own family doctors but the clinic also runs an emergency service for those who develop severe and prostrating headaches while at work.

The Clinic was formally opened by Princess Margaret on 19th May, 1970, and during the first month of opening 106 new patients were seen, 80 referred by their doctors and 26 coming up with an acute attack. This degree of support is an indication of the necessity for such a clinic.

The Clinic is open daily from Monday to Friday from 10 a.m.-4 p.m. and there are a doctor and nurse on duty throughout this time; the medical staff consists of one whole time and two part time doctors. The Clinic is in Bartholomew's Close and has been converted from two derelict tailors' shops; it is small but there are three consulting rooms and three recovery rooms available for patients who are recovering from headaches. St. Bartholomew's Hospital has given great support to this project from the beginning and without their help it would not have been possible to start it. The Clinic is entirely the financial responsibility of the Migraine Trust and payment has to be made to the National Health Service for any investigations which may be carried out on patients attending the Clinic. There is, however, a close liaison between the Clinic and St. Bartholomew's Hospital, and the medical staff have kindly consented to see any general medical or surgical problems that may arise in patients attending the Clinic. Of the first 100 patients seen nine had hypertension or other disorders of the vascular system, one had thyrotoxicosis, and another had carcinoma of the breast.

The Clinic offers unique opportunities for research into migraine as it will be the only centre in England where a significant number of patients will be seen in acute attacks. Research projects will include evaluation of the biochemical and vascular changes which may take place in an acute attack, as well as clinical trials of new drugs for migraine.

MARCIA WILKINSON, D.M., F.R.C.P.

C.A.R.E. CONCERT GREAT HALL, MAY 1970

—About CARE

CARE was founded in 1967 to provide a home life and suitable work for mentally handicapped people in supervised communities. The first venture was Blackerton Farm, Devon, which now houses twenty "patients" and provides them with rural occupations. Within two years Blackerton should be expanded to accommodate fifty villagers, and other villages are planned; the next to open will be in the Home Counties. An estimated 10,000 people need this sort of care, but Local Authority hostels provide places for only 1,800. The remainder live at home and attend Training Centres, until their parents die or can no longer cope with the problems of looking after a mentally handicapped offspring. Long-term admission to mental hospital is the usual outcome. CARE could give these people just what they need: close supervision, community life, and rewarding work suited to their abilities. It is difficult to imagine a cause more worthy of our support. Several working parties of Bart's students and nurses have been to Blackerton, and more will always be welcome. Details are obtainable from:— C.A.R.E., Care House, Bigland Street, London E.1.

—About the concert

Where were you on the evening of 14th May, 1970? You almost certainly were not in the Great Hall, and you therefore missed an excellent concert of seventeenth and eighteenth century music given by the Rahere Ensemble:— Godfrey Salman, violin; David Baker, flute; Myra Chahin, cello; Martyn Parry, spinet. The ensemble provided their services free of charge, and you could have heard them for nothing if you could have drunk 5/- worth of the wine in the fifteen minute interval.

The programme opened with a Händel Trio Sonata, in which the technical skill, co-ordination and musicianship of the players was immediately apparent. The rather over-resonant acoustics of the Great Hall were also noticeable, and the final Allegro of the work might have gained in clarity with a steadier tempo. Subsequently this resonance was less obtrusive; possibly some significant damping effect was produced by the large proportion of the audience admitted during and after the first item.

There followed a series of solo pieces featuring each member of the ensemble in turn. A sonata for Flute and Continuo by Jean-Marie Leclair was played with considerable panache by David Baker, who throughout the programme demonstrated sound technique and astonishing reserves of tone. This was a charming, slightly wistful work, containing nothing to suggest why the composer should have been murdered in a Paris street, just outside his front door. Martyn Parry's continuo

playing was always of the highest standard, and his solo items were splendid. Five anonymous pieces from the 1656 "Elizabeth Rogers Virginall Booke", and "The Earle of Salisbury, His Pavin" by Orlando Gibbons (died 1625), suggested that the art of playing and constructing keyboard instruments was remarkably advanced in the early seventeenth century. Even Parry's more modern instrument provided a few para-musical noises.

Perhaps the most interesting work of the concert was the cello sonata by Henry Eccles (died 1742). Myra Chahin played this near-virtuoso piece from memory, and the Great Hall resounded with the richness of her tone. A very few notes pitched just off-centre did not mar an exciting performance. Godfrey Salman's chosen work was J. S. Bach's Third Violin Sonata, which he played with assured technique and evident understanding. I felt, however, that the work would have benefited from a more muscular approach. The ensemble items might also have been improved by a more gutsy violin tone, though some may prefer Salman's restrained style.

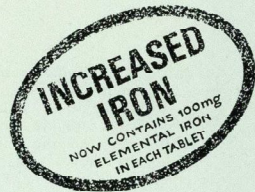
The complete ensemble also played works by Telemann, Johann Pachelbel and Quantz. Telemann wrote a vast quantity of music, including, it seems, much of Haydn's early output; many of his works are finely constructed and polished, and deserve to be heard more often. The fact that he did not live in heroically extreme poverty and failed to die before he was eighty-six may account for his lack of popularity; it is therefore especially pleasant to record that his A minor Trio Sonata here received a thoroughly satisfying performance. Pachelbel was a precursor of J. S. Bach, and his Partita no. 6 was a well-chosen example of his clear, finely textured style. The Quantz Trio Sonata turned out to be a jaunty little work which ended the whole concert in fine style.

The Rahere Ensemble were impressive throughout in their technical ability, co-ordination and mutual musical understanding. Their performance was of professional standard, and was happily free from any mannerisms extraneous to the production of musical sound. Only their dress was uncharacteristic of professional musicians, for their clothes fitted and were evidently not second-hand; an incorrectly-sized suit and a generally seedy appearance are the hallmark of a really seasoned performer.

This was an excellent concert in aid of an excellent cause, reasonably well advertised and a bargain at the price. The shamefully small size of the audience may be an indication of the "sort of stuff of which Bart's men are made". If it is, then I wish they were made of something different.

Steve Warrington.

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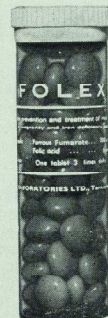
* B. M. J. No. 5529. Page 158.

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OBESITY SUPPLEMENT

1. Obesity-Clinical Aspects by J. TREVOR SILVERSTONE
2. Drug Treatment of Obesity by PAUL TURNER
3. Dietary Management of Obesity by BRIDGET MACARTNEY

1. OBESITY - CLINICAL ASPECTS

By J. Trevor Silverstone,
M.A., D.M., M.R.C.P., D.P.M.

Definition

Obesity can be defined as an excess of adipose tissue in the body. While for research purposes it may be necessary to determine directly the ratio of adipose tissue to lean body mass by techniques like densometry (this involves total immersion and the application of Archimedes principle), or by measuring skinfold thickness, clinically it is usually sufficient to rely on a pair of scales and a height measuring rod to detect the condition. It has been calculated from actuarial tables that for each height there is an "ideal" weight at which individuals tend to live longer, and obesity can be considered to be present when this ideal weight is exceeded by 20% or more—the relevant weights and heights are given in Table 1.

Prevalence

Obesity is by far and away the commonest nutritional disorder in the Western world, and is present to some degree in well over a third of the adult population in this country. Significant obesity has been found in almost one in every five men and one in every four women in the London area.

People tend to get fatter as they get older—the prevalence of obesity rises from 5% among teenagers to over 50% among middle-aged women. Overweight is also related to social class as well as to age: in a recent survey undertaken in London it was found that people, particularly women, in social classes 4 and 5 were much more likely to be obese than women of a similar age who were of a higher socio-economic status. The same relationship between obesity and social class was found in New York, while in India the reverse holds true, obesity is more common among those who are better off. I think these findings can most easily be explained as follows: in those societies (e.g., U.K., U.S.A.) where there is a superfluity of food most of us tend to put on weight as we grow older—however, those in the upper social classes care more about their weight either for cosmetic or medical reasons and therefore take steps to avoid getting fat—they watch what they eat, try to take regular exercise, they even go to health farms; while those in the working classes do not worry so much. In support of this line of reasoning a market research survey has revealed that women in social classes 1 and 2 do go on diet significantly more frequently than those in social classes 4 and 5. Furthermore, it was estimated that over a third of all women try to diet at least once a year, while at any one time some 10% of men and 20% of women are attempting to lose weight. Unfortunately, almost half of these would-be slimmers fail absolutely in their attempt.

Morbidity

Although the majority of those trying to lose weight are doing so entirely for the sake of their appearance they should nevertheless be strongly supported in their endeavours by the medical profession. Weight reduction is probably one of the most fruitful areas for preventive medicine. Certainly obese individuals have a much higher incidence of ischaemic heart disease, and other manifestations of atherosclerosis. For instance, among

TABLE 1
Desirable Weights (Kg.)

(The figures in brackets denote 20% above desirable weight.)

HEIGHT	FEMALE	MALE
(cm.) (ft. ins.)		
147.3 (4. 10)	53.98 (64.78)	
149.9 (4. 11)	55.34 (66.40)	
152.4 (5. 0)	56.70 (68.04)	
154.9 (5. 1)	58.06 (69.67)	
157.5 (5. 2)	59.42 (71.30)	63.96 (76.75)
160.0 (5. 3)	60.78 (72.93)	65.32 (78.38)
162.6 (5. 4)	62.60 (75.12)	67.13 (80.56)
165.1 (5. 5)	64.41 (77.29)	68.95 (82.74)
167.6 (5. 6)	66.22 (79.46)	70.76 (84.91)
170.2 (5. 7)	68.04 (81.65)	73.03 (87.64)
172.7 (5. 8)	69.85 (83.82)	75.30 (90.36)
175.3 (5. 9)	71.67 (86.00)	77.11 (92.53)
177.8 (5. 10)	73.94 (88.73)	78.93 (94.72)
180.3 (5. 11)	76.20 (91.44)	81.19 (97.43)
182.9 (6. 0)	78.47 (94.16)	83.46 (100.15)
185.4 (6. 1)		85.73 (102.88)
188.0 (6. 2)		88.00 (105.60)
190.5 (6. 3)		90.27 (108.32)

those who are 20% above their desirable weight the morbidity rate from ischaemic heart disease is three and a half times that among those of normal weight; furthermore, the mortality rate also rises sharply with increasing obesity. That this is an area where preventative measures can bring pronounced benefit is shown by the dramatic reduction in mortality which can be brought about by successful weight reduction.

Not only does obesity make people more predisposed to ischaemic heart disease, hypertension and other vascular conditions, it is associated with significantly increased morbidity and mortality from other conditions including diabetes mellitus, cholecystitis, and osteoarthritis, plus an increased risk in pregnancy, at operation and in accidents.

Causation

1. General Principles

For an individual to gain weight his energy intake in the form of food must exceed his energy expenditure. Most of us maintain a reasonably steady weight which implies that we are in energy balance; our calorie intake equals our calorie expenditure. Fortunately this regulatory system is extremely finely balanced—a deviation of only 1% if continued for a number of years can lead to quite alarming obesity. For instance if a man weighing 70 kg. were to eat the equivalent of a slice of bread and butter a day more than he expended he would double his weight during his working life. It follows that, for some reason, in obesity the regulation breaks down, at least temporarily. Possibly metabolic factors underlie such dysfunction but these are as yet not fully elucidated. I shall endeavour to discuss some of the more general factors which can be associated with obesity.

2. Genetic Factors

It is true that obesity runs in families. While this could be merely a reflection of common eating patterns it does seem that in some cases there is a true genetic predisposition to being overweight—identical twins brought up apart are more likely to have a similar weight than non-identical twins reared together and the weights of adopted children are not at all closely related to the weights of their adopted parents.

However, even after agreeing that genetic factors can be important we are little nearer to understanding the underlying mechanism—it may be that those from obese families use up less energy, or they may eat more food, or it may be a combination of the two.

3. Neurological Factors

The key area within the central nervous system concerned with the regulation of food intake is the hypothalamus. The ventro-medial hypothalamus contains the "satiety" centre which if damaged makes experimental animals behave as if they fail to get full up—the lateral hypothalamus contains the feeding centres, destruction of which leads to complete cessation of eating and death from inanition.

In clinical practice cases of obesity in which there is a neurological lesion involving the hypothalamus are extremely rare, and are for all intents and purposes of academic interest only.

4. Endocrinological Factors

Cushing's syndrome is classically associated with obesity which is largely limited to the trunk, the limbs being slender. While occurring more often than neurological obesity this too must rank as a relatively uncommon cause of overweight—and in the vast majority of patients seen in an obesity clinic there is unlikely to be any evidence to support the patient's fervent belief that the trouble lies not with his eating pattern but with his "glands".

An even rarer endocrine disorder, spontaneous hypoglycaemia due to tumours or hyperplasia of the islets of Langerhans is accompanied by obesity at times—the history of recurrent hypoglycaemic episodes should alert one to the possibility.

5. Psychological Factors

Somewhat contrary to current popular belief most fat people are not overweight as a result of emotional or other psychological disturbance and overweight individuals are no more likely to be neurotic than their more slender contemporaries. Having said that we must nevertheless recognise that there are some people who do react to stress and despair by overeating, thereby gaining weight. Such people seem to fall into two categories, the first of which I have called "Neurotic obesity" and the second "Reactive obesity".

(a) Neurotic Obesity

The neurotic obese are those who have been overweight since adolescence and who have a pathological preoccupation with their appearance and with food. They may have quite disturbed personalities and find it particularly difficult to keep to a diet because any vicissitude in their environment makes them turn to food. While such people form no more than 5% of the total obese population it is among this small proportion that the most bizarre eating patterns are to be found, including "compulsive eaters" (people who literally cannot stop themselves eating even though they are not hungry), "binge eaters" (those who go on periodic bursts of gross overeating lasting hours or even days at a time) and "night eaters" (who gradually build up their food intake during the day, reaching a crescendo of eating in the middle of the night). These patients all tend to do badly with simple weight-reducing programmes and for them psychiatric treatment is probably necessary.

(b) Reactive Obesity

This is obesity coming on in adult life which can be seen as a clear-cut reaction to a particular circumstance. A menopausal woman feeling herself no longer needed by her family or by society or a bereaved widow may turn to food for solace. I would estimate that reactive obesity would account for perhaps 30% of the cases.

6. Non-specific Factors

This would leave some 65% of the problem unaccounted for. Most obese individuals have no neurological, endocrine or psychological disturbance, they have merely tended to get fat as they grew older—this I refer to as "maturity onset" obesity. It will be remembered that we have already seen how there is an increasing prevalence of obesity with increasing age which probably comes about as a result of a gradual

reduction in energy output as we grow older without a corresponding reduction in calorie intake. Luckily such people respond well to simple dietary measures if they can be persuaded that they need to lose weight. It is here that social factors become important—if someone believes that it is a sign of health or of success to be

fat then no amount of persuasion will get him to diet successfully. Therefore before we can hope to succeed in lowering the alarming prevalence of obesity in our society we must educate the public that it is not only unattractive to be fat, it is also dangerous. As doctors we must treat it seriously.

2. DRUG TREATMENT OF OBESITY

By Paul Turner

An understanding of the therapeutic basis for the drug treatment of obesity depends on the realisation that weight loss can only occur when *calorie intake* falls below *calorie expenditure*. There is no substitute for this principle, and all the measures which we are to discuss aim in some way either to reduce food intake or increase calorie expenditure by energy production.

Increased calorie expenditure

Thyroid hormones in the form of thyroid extract or l-thyroxine are still used by many doctors to increase metabolic rate and hence to produce weight loss. This should be actively discouraged, however, because (a) they have never been shown to be really effective and (b) they may produce clinical signs of thyroid overactivity, and lead to the development of angina pectoris in patients with ischaemic heart disease.

Regular moderate exercise is the only acceptable way to use up unwanted calories and produce weight reduction.

Reduction of food intake

The main problem here, which is seldom appreciated even by doctors, is that the majority of patients with established obesity do not eat excessively. Their period of overeating probably occurred many years earlier, and they are now maintaining their excess weight with a caloric intake which is in the normal range, or may even be lower than normal because their calorie expenditure of energy is restricted by their obesity and lack of exercise. It is almost inevitable that further calorie restriction will lead to hunger and discomfort in the majority of these patients, and the most important therapeutic factor, therefore, is the rapport between the patient and his doctor, which should provide continual support and encouragement during the long period of treatment.

There have been sporadic attempts to reduce the absorption of food from the intestine by short-circuiting operations and by drugs such as neomycin which produce a malabsorption state. However, these are not satisfactory, as they may lead to states of chronic

malnutrition and vitamin deficiencies which are not acceptable alternatives to obesity.

The most important method of reducing food intake is by suppressing appetite, and this may be achieved in two ways:

1. Bulk agents

Appetite suppression results from a sensation of satiety which might theoretically be expected from ingestion of an inert substance which, not being absorbed from the gut, provides no calories for weight increase. The most commonly used substance is methylcellulose which is available as tablets or in proprietary food substitutes such as Limmitis biscuits. Although this treatment would be free from the side effects of more active drugs, its therapeutic value has not been proven satisfactorily, and it cannot be recommended for the routine management of obesity.

2. Appetite suppressant drugs

There are a large number of drugs which are said to suppress appetite, although, in fact, such an effect is difficult to show objectively. Dr. Trevor Silverstone has developed a sensitive rating scale, however, which has demonstrated statistically significant anorectic actions of some amphetamine derivatives. Although we cannot be certain that their weight-reducing properties are not due to other factors as well, it seems reasonable to suppose that at least part of their action is due to this. Controlled trials of most drugs of this type show that their maximum effects are seen within the first six weeks of treatment, and that there-after their effectiveness tends to wane. It is probable, therefore, that intermittent treatment is as effective (as well as cheaper) as continuous therapy, and may also, of course, be safer from the point of view of side effects.

(a) *Amphetamine and related compounds.* There are a variety of these drugs, which have been shown to assist patients in adhering to a dietary regime and in losing weight, and some of the more important are shown in Table I.

GROUP 1	DRUG	FORMULA	PROPRIETARY NAME
	AMPHETAMINE		BENZEDRINE DEXEDRINE DUROPHET
	PHENMETRAZINE		PRELUDIN FILON
	DIETHYLPROPION		TENUATE APISATE
	PHENTERMINE		DUROMINE
	CHLORPHENTERMINE		LUCOPHEN
GROUP 2	FENFLURAMINE		PONDERAX

The compounds in Group 1 are sympathomimetic amines which depend for their action on releasing noradrenaline from sympathetic nerve endings. They are, therefore, ineffective when noradrenaline depletion has been produced by drugs or surgery. They are most effective if taken 1-1½ hours before a meal, although some of them are available in sustained-release preparations requiring only one daily dose. It is unlikely that anyone of these is markedly superior to the others in weight-reducing potency, although the incidence of side effects may differ and individual patients may respond to one better than another. The most important unwanted effects with these compounds are due to their central stimulant action which may lead to restlessness, anxiety, insomnia and more important, perhaps, to tolerance and habituation. Studies in my department have shown that single therapeutic doses of amphetamine, phenmetrazine, diethylpropion and chlorphentermine produced significant elevation of the central flicker frequency, a sensitive test of central nervous activity.

It used to be thought that appetite suppression was inevitably linked to central stimulation, but this is now known not to be true. Fenfluramine (Group 2) is a member of a new group of amphetamine derivatives with a trifluoromethyl group on the aromatic ring. It has weight reducing properties of the same order as the Group 1 compounds, but at therapeutic doses does not produce central stimulation, but may, in fact, cause some sedation and central depression. It does not affect central flicker frequency in single therapeutic doses, and Oswald and his colleagues in Edinburgh have shown that it does not produce the abnormalities of sleep rhythm which are seen, for example, with diethylpropion and other central stimulant drugs which commonly produce dependence. Several cases of overdosage with fenfluramine

have recently been reported, and after very large doses a clinical picture resembling mild amphetamine intoxication may be seen. Such a picture may also be seen if fenfluramine is given to patients receiving monoamine oxidase inhibitors, and it is of interest that animal studies by Garattini and his colleagues in Milan showed central stimulation by fenfluramine in animals made hyperthyroid, but not in euthyroid animals. Although the mode of action of fenfluramine is not yet understood, our studies here in isolated human tissues have shown that it has similar pharmacological effects to noradrenaline on smooth muscle of the vascular, gastrointestinal and urogenital systems, but whereas noradrenaline's actions are blocked by adrenergic receptor blocking drugs such as thymoxamine and phenoxybenzamine, those of fenfluramine are not. This suggests that fenfluramine may be acting directly on the cell membrane or perhaps within the cell beyond the receptor. Recent metabolic investigations by Professor Butterfield at Guy's Hospital using perfusion techniques in the veins of the forearm have shown that infusion of fenfluramine caused vasodilatation and an increase in tissue glucose uptake. The increase in glucose uptake was greater than could be accounted for by the increased blood flow, and it was suggested that fenfluramine has effects similar to mild exercise in that it diverts ingested carbohydrates away from adipose tissue. Pawan at the Middlesex Hospital has also provided evidence that therapeutic oral doses of fenfluramine have a fat-mobilising effect, shown by a rise in plasma free glycerol, free fatty acids and "ketones", and a fall in triglyceride levels. It may well be that these metabolic effects of fenfluramine are shared by the amphetamines of Group 1, but further research is required to confirm this.

(b) *Diguanide drugs.* These drugs, of which metformin and phenformin are the principle members in current use, are alternatives to the sulphonylurea compounds in the oral treatment of diabetes mellitus. They frequently produce anorexia both in diabetic and non-diabetic patients, and for this reason they are generally become the first-line drugs for use in the overweight middle-aged or elderly diabetic patient who is unable to adhere to a diet, or in whom diet alone has failed to produce satisfactory weight loss. It is probable that other metabolic effects of diguanides contribute to their weight-reducing properties. Although their effectiveness in obese diabetic patients has been amply demonstrated, their usefulness in obese non-diabetic patients

is still under investigation. Fortunately, they do not have a significant hypoglycaemic action in non-diabetic patients.

In conclusion, it is evident that no form of drug treatment for obesity is free of unwanted side effects, and it is necessary, therefore, for the doctor to weigh up the risks of continuing obesity in each patient against the hazards of drug treatment. Only when dietary measures have failed should he consider drug therapy, and even then he should be certain that he has exercised all his powers of persuasion and encouragement. No drug is a satisfactory substitute for the persistent supportive care of the patient's own doctor.

3. DIETARY MANAGEMENT OF OBESITY

by Bridget Macartney

Obesity is an increasing problem in modern Western societies and one in which dietitians are very closely involved. Generally speaking obesity is only caused by an excess of calories over the individual's caloric requirements. In other words the patient has at some time eaten in excess of his energy requirements and has continued to eat in excess and thus remained overweight. For an example, a daily excess of 50 calories will give a weight gain of 4 lbs a year. No treatment of obesity can exclude the use of diet as part of the patient's therapy. These are various diets in use which I will discuss before outlining our policy at St. Bartholomew's.

Starvation Therapy

The method which produces the greatest weight loss is starvation. This is not a new method. It was first used in 1915 by Fohn and Dennis. It was enthusiastically re-introduced not long ago and was recently very much the vogue. The patients on a starvation diet do not complain of hunger after the first few days and this is assumed to be related to the elevation of serum ketones. A high level of serum ketones is known to be related to anorexia. Any patient I have known on this form of treatment has stood it fairly well. There are however several disadvantages to this type of therapy. Firstly it is expensive because the patient must be hospitalized, and secondly it can only be used for relatively healthy subjects. Any patient with cardiovascular and cerebrovascular disease, gout, hypertension and diabetes should be excluded from this form of treatment. Thirdly patients must be under constant observation as acidosis and hypotension are not infrequent with this form of treatment. Fourthly, care must be taken at the end of the patient's fast because they are very often in a hypometabolic state and can rapidly put on weight again despite Low Calorie diets. Whilst I cannot disagree that patients can lose a large amount of weight with this form of treatment, I do feel it must be undertaken with great care, particularly during the period of readjustment after the fast. All too frequently patients gain weight after a fast and if they are discharged too

soon we are left with a disillusioned and unco-operative patient. May I dare to suggest that this regime should only be used in the really obese patient for a purpose such as elective surgery?

High Fat Reducing Diet

The old saying "eat fat and grow thin" has an obvious appeal to the public and many popular books and newspaper articles have jumped on the band-wagon with this philosophy. Kekwick and Pawan (1956) treated patients in hospital on a 1,000 Calorie diet of which 90% were supplied in the form of fat. Their initial weight loss was high but it has been suggested that this rapid loss of weight (2-4 kg. in a few days) is due to loss of water. Similar weight losses occur on complete starvation diets. In any case one cannot expect a patient to remain on such a bizarre diet for more than a few days.

High Protein/Low Carbohydrate

Some weight reducing diets (e.g. Banting) have been based on a high Protein intake. The diet is composed on the principle of eating meat and other foods rich in Protein. The theory behind this being that the specific dynamic action of Proteins will raise the metabolism by 100-200 Calories per day, but as Davidson says, this is of little help in the treatment of obesity. Many people do find that a meal consisting mainly of Protein delays the onset of hunger for longer than a meal high in carbohydrate. High Protein diets are expensive and for this reason alone are not practical for a lot of people.

Marriott's Diet

Marriott's Diet, which is low carbohydrate, low fat, was probably the first of the well known free diets in this country this century. The original diet allows a patient to eat as much of the Protein foods as they like but forbids fats of any kind and many of the starchy and sugary foods except potatoes. Milk is limited to ½ pint and bread to three small slices. The use of this diet has proved most satisfactory.

Liquid Diet

A balanced liquid diet may be useful as a temporary measure, or as a substitute for one meal when the available food is unsuitable. Metrecal (Metrecal U.S.A.) is such a liquid diet and four cans of it provide 900 Calories. Similarly Complian powder can be used and is also successful. The powder has to be mixed with water before use. These proprietary foods are less palatable, more monotonous and certainly more expensive than a diet constructed from natural foods.

Meal Substitutes

These usually take the form of a biscuit and there are quite a few varieties (e.g. Limmits, Bisks, Trimmets etc.) on the market. They are intended as a substitute for one meal, or as a complete diet. It is usually recommended that they are taken with a glass of milk or other fluid. They have their uses in slimming diets as long as their Calorie content is known and realised.

Fad Diets

These are frequently published in books and magazines and often recommend living for a week on such foods as milk and banana or oranges and peanuts. I think it is fair to say that on a long term basis they are ineffective and usually nutritionally unsound.

Frequency of Meals

Workers have shown that there is no difference in the weight loss between patients taking two and five meals a day using a 1,000 Calorie diet, or one, three and nine feedings a day using a 600 Calorie diet. One worker has found that patients who failed to lose weight on the two meals a day regime have been successful with five. With this finding, the multi-meal treatment may need further evaluation.

At St. Bartholomew's Hospital we use the conventional sub-caloric diets for the dietary treatment of obesity. In other words we reduce the total number of Calories but in constructing the diet we ensure that it contains sufficient Protein, Vitamins and minerals with enough fat and carbohydrate to be palatable. A standard 1,000 Calorie diet will contain 65 g. Protein, 48 g. fat and 80 g. carbohydrate. On a diet such as this we would generally expect a busy housewife to lose between 2.3 lbs. a week if she followed it strictly.

Peoples' dietary requirements vary according to their occupation, and so therefore do the number of Calories required for weight reduction. Reducing diets are prescribed for each patient with these thoughts in mind. Usually we use the basic 1,000 Calories for an out-patient but if the patient is extremely obese or leads a very sedentary life a 750 Calorie diet may be prescribed. Anything below this is impractical for use on an out-patient basis.

Very obese patients who are hospitalized may well be given a 500 Calories diet initially, which will be increased to 750, 800 or 1,000 Calories on discharge. Pregnant women who have gained too much weight are put on a 1,400 Calories diet. The extra Calories over and above 1,000 allow for the increased Protein and milk required by these women.

The treatment of obesity is not as easy as it sounds. One of the main reasons for this is that the patient is often very unwilling to accept the discipline which slimming requires. Many people try to slim by their own

initiative, but I feel it is important for them to seek professional help where and whenever possible. At the outset of treatment the patient should be made to understand the dangers and complications of obesity in order to realise why reduction in weight is advisable. Many of these obese patients have faulty eating habits which it is necessary to try and correct, not only for weight reduction itself but also for maintaining the new lower weight when dietary restrictions are relaxed. Many people tend to lead irregular lives which means varying meal times, and although this makes slimming more difficult the diet sheet can and should be adapted to the meal pattern of a particular patient as far as possible. The more a Dietitian can help a patient, the more chance there is of a satisfactory weight reduction. It is important for us to see these people at regular intervals, not only to check their weight but to encourage them, and if they are not doing well to try and find out the reason. Our normal routine is to try and see our patients at monthly intervals. Our follow-up system has not been entirely satisfactory and we felt many of our obese patients were not bothering to come back to see us through some fault of ours. We have very recently tightened up the regime. I hope our new system will enable us to keep a closer check on our patients and a reminder will be sent out to them with a new appointment. My feeling about our obese patients is that for every ten who obviously think our treatment is a complete waste of time we get one who is really pleased at having lost weight and has obviously followed her diet. For the one patient who, on losing weight says she is really enjoying life again, it is worth while persevering with the other ten. I am always hopeful that one day we may win with them. Above all they need encouragement and to have someone who takes an interest in how they are progressing.

It is uncommon to find obesity amongst really active individuals. The increasingly sedentary lives that are being lived in modern societies and the alarming increase of sugar consumption of 14 lbs. per head per annum in 1815 to 120 lbs. in 1965 may well be two major factors in the increase of obesity. What can we do about it? One way in which Dietitians could help would be through Public Health. There are all too few openings for us in this field of work. By working in a Public Health department it would be possible to teach sound nutrition in schools, Welfare Clinics and also to other sections of the community. As hospital Dietitians we are more often than not trying to correct faulty eating patterns without much chance of practising preventative nutrition. In a small way at St. Bartholomew's we are now perhaps teaching a small section of the community in the preventative field when we see each new antenatal patient at the booking-in clinic. Pregnancy is a common cause of obesity and I hope that by seeing each patient we may help them to realise the importance of not becoming overweight.

As Dietitians there are many ways in which we could educate people in sound nutrition and good eating habits and in doing so help them to avoid the dangers of obesity.

MISS B. E. MACARTNEY, S.R.D.
(Chief Dietitian)

Recent Papers By Bart's Men

- ADNITT, P. I. and TAYLOR, ENID. Progression of diabetic retinopathy: Relationship to blood-sugar. *Lancet*, March 28, 1970, pp. 652-654.
- *BAKER, D. J. and LINDOP, PATRICIA. Oxygen cathode measurements in the mouse testis. *Phys. Med. Biol.*, 15, 1970, pp. 263-270.
- BEARD, R. W. Fetal blood sampling. *Brit. J. Hosp. Med.*, 3, 1970, pp. 523-534.
- , (and Roberts, G. M.). A prospective approach to the diagnosis of intrauterine growth retardation. *Proc. Roy. Soc. Med.*, 63, 1970, pp. 501-502.
- BEDFORD, M. A. (and MacFaul, P. A.). Ocular complications after therapeutic irradiation. *Brit. J. Ophthalmol.*, 54, 1970, pp. 237-247.
- BIRDWOOD, G. Personal view. *Brit. med. J.*, May 9, 1970, p. 360.
- BORRIE, P. F., *see* DYER, N. H. and others.
- BRAIMBRIDGE, M. V. (with others). The necessity for measurement of left atrial pressure after cardiac valve surgery. *Thorax*, 25, 1970, pp. 185-189.
- BROOKS, A. G. F., *see* LAWTHOR, P. J. and others.
- BROWNE, D. S., *see* CAWLEY, M. I. D. and —.
- BUCK, A. C., *see* ROBERTS, M. F. with others.
- BUCKLE, R. M. Classification of diabetes mellitus. Symptoms, signs and treatment. *Med. World*, 108, 1970, pp. 12-16.
- , *see also* KNILL-JONES, R. P. and others.
- BUCKNILL, T. M., *see* LEWIS, O. J. and others.
- CATCHPOLE, B. N. (with others). The prophylactic valve of cooling strangulated herniae locally: An experimental study in dogs. *Brit. J. Surg.*, 57, 1970, pp. 306-308.
- *CATTELL, W. R. and others. Comparison of the renal excretion of Hypaque 45% and Urografin 60%. *Brit. J. Radiol.*, 43, 1970, pp. 309-313.
- *CAVE, A. J. E. Observations on the monotone inter-clavicle. *J. Zool., Lond.*, 160, 1970, pp. 297-312.
- CAWLEY, M. I. D. and BROWNE, D. S. Insulin resistance and thrombocytopenic purpura occurring in the same patient. *Brit. J. Clin. Pract.*, 24, 1970, pp. 169-174.
- CHAMBERLAIN, D. A. (and others). Sequential atrioventricular pacing in heart block complicating acute myocardial infarction. *New Eng. J. Med.*, 282, 1970, pp. 577-582.
- CLARKE, J. A., *see* SALSBERY, A. J. and —.
- *COHEN, L. The "pill", promiscuity and venereal disease. *Brit. J. vener. Dis.*, 46, 1970, pp. 108-110.
- *COUPAR, I. M. and TURNER, P. Relative potencies of some false transmitters on isolated human smooth muscle. *Brit. J. Pharmacol.*, 38, 1970, p. 463P.
- *CROOK, E. M. Enzymes on solid matrices. *FEBS Symposium*, 19, 1969, pp. 297-308.
- DAVIS, R. E., *see* MILLBANK, L. and others.
- DAWSON, A. M., *see* DYER, N. H. and others.
- , *see also* HAMILTON, J. D. and others.
- , *see also* ZEEGEN, R. and others.
- DRINKWATER, J. E., *see* ZEEGEN, R. and others.
- DU BOULAY, G. and TRICKEY, S. The sella in aqueduct stenosis and communicating hydrocephalus. *Brit. J. Radiol.*, 43, 1970, pp. 319-326.
- DYER, N. H. and others. Cutaneous polyarteritis nodosa associated with Crohn's disease. *Lancet*, March 28, 1970, pp. 648-650.
- , *see also* HAMILTON, J. D. and others.
- *EDMONDS-SEAL, J. (and PRYS-ROBERTS, C.). Pharmacology of drugs used in neuroleptanalgesia. *Brit. J. Anaesth.*, 42, 1970, pp. 207-216.
- EDWARDS, C. R. W. (with others). Polytome encephalography in investigation of pituitary tumours. *Proc. Roy. Soc. Med.*, 63, 1970, p. 464.
- EDWARDS, Griffith. Place of treatment professions in society's response to chemical abuse. *Brit. med. J.*, April 25, 1970, pp. 195-199.
- FENTON, J. C. B., *see* HAMILTON, J. D. and others.
- , *see also* ZEEGEN, R. and others.
- FLEMING, J. S., *see* SHINBOURNE, E. A. (with others).
- FRY, I. Kelsey, *see* SPIRO, F. I. and —.
- , *see also* CATTELL, W. R. and others.
- *GIBBS, Dorothy A. and WATTS, R. W. E. The action of pyridoxine in primary hyperoxaluria. *Clin. Sci.*, 38, 1970, pp. 277-286.
- *GRAHAM, G. The formation of the medical and surgical professional units in the London Teaching Hospitals. *Ann. Sci.*, 26, 1970, pp. 1-22.
- GUNZ, F. W. (with Hamer, J. W.). Multiple aetiological factors in a case of acute leukaemia. *N. Z. med. J.*, 71, 1970, pp. 141-142.
- HAMER, J. The vectorcardiogram in mitral valve disease. *Brit. Heart J.*, 32, 1970, pp. 149-159.
- , *see also* SHINBOURNE, E. A. (with others).
- HAMILTON, J. D. and others. Assessment and significance of bacterial overgrowth in the small bowel. *Quart. J. Med.*, 39, 1970, pp. 265-285.
- HAMILTON, W. J. (and Girmes, D. H.). The foetus at risk. *Proc. Roy. Soc. Med.*, 63, 1970, pp. 496-498.
- HAMSHERE, R. J., *see* LEWIS, O. J. and others.
- HEATHFIELD, K. W. G. (with others). Intracranial venous thrombosis as complication of oral contraception. *Lancet*, May 2, 1970, pp. 914-918.
- HULME-MOIR, I. (and Williams, D. I.). Primary obstructive mega-ureter. *Brit. J. Urol.*, 42, 1970, pp. 140-149.
- KAZANTZIS, G. (with others). Subclinical neuropathy in lead workers. *Brit. med. J.*, April 11, 1970, pp. 80-82.
- *KERSLEY, G. D. (with others). Rib lesions in rheumatoid disease. *Brit. J. Radiol.*, 43, 1970, pp. 269-270.
- *KINMONTH, J. B. (with others). Filling of cervical and mediastinal nodes from the thoracic duct and the physiology of Virchow's node—studies by lymphography. *Brit. J. Surg.*, 57, 1970, pp. 267-271.
- KNIGHT, R. J. Medical care in Australia. *Brit. med. J.*, May 9, 1970, pp. 356-357.
- *KNILL-JONES, R. P. and others. Hypercalcemia and increased parathyroid-hormone activity in a primary hepatoma. *New Eng. J. Med.*, 282, 1970, pp. 704-708.
- LANE, R., *see* CATTELL, W. R. and others.
- *LAWTHOR, P. J. and others. Respiratory function measurements in a cohort of medical students. *Thorax*, 25, 1970, pp. 172-177.
- *L'ETANG, H. Lenin's final illness. *Practitioner*, 204, 1970, pp. 587-590.
- *LEWIS, O. J.
- *—. The development of the human wrist joint during the fetal period. *Anat. Rec.* 166, 1970, pp. 499-516.
- , and others. The anatomy of the wrist joint. *J. Anat.*, 106, 1970, pp. 539-552.

- *LIND, Norma A. and SHINEBOURNE, E. Studies on the development of the autonomic innervation of the human iris. *Brit. J. Pharmacol.*, 38, 1970, p. 462P.
- LINDOP, Patricia J., see BAKER, D. J. and —.
- *LUMB, G. (with others). Ultrastructural hepatic changes following the administration of benzyldene-yohimbol. *Toxicol. appl. Pharm.*, 16, 1970, pp. 239-255.
- MCCOLL, I. Pruritus ani. In Morson, B.C. Ed., *Diseases of the Colon, Rectum and Anus*, 1969, pp. 295-301.
- , and others. Polyps and polyposis. In Morson, B.C. Ed., *Diseases of the Colon, Rectum and Anus*, 1969, pp. 91-103.
- McKERRON, C. B. (and others). Symptoms and lung function following acute and chronic exposure to tolylene diisocyanate. *Proc. Roy. Soc. Med.*, 63, 1970, pp. 376-378.
- *MARSHALL, R. D. A connector for the Bassett cuffed tracheostomy tube. *Anaesthesia*, 25, 1970, pp. 272-273.
- *MELDRUM, S. J. Some aspects of cryosurgery. *Bio-med. Eng.*, March 1970, pp. 120-124.
- , and WATSON, B. W. Tremor recording in Parkinson's disease. *Phys. Med. Biol.*, 15, 1970, pp. 249-254.
- MILLARD, F. J. C. (with others). Calcium and phosphorus metabolism in relation to lactose tolerance. *Lancet*, May 16, 1970, pp. 1027-1029.
- *MILLBANK, L. and others. Automation of the assay of folate in serum and whole blood. *J. clin. Path.*, 23, 1970, pp. 54-59.
- MISIEWICZ, J. J. (with Holdstock, D. J.). Factors controlling colonic motility: Colonic pressures and transit after meals in patients with total gastrectomy, pernicious anaemia or duodenal ulcer. *Gut*, 11, 1970, pp. 100-110.
- , (with others). Propulsion (mass movements) in the human colon and its relationship to meals and somatic activity. *Gut*, 11, 1970, pp. 91-99.
- MOLLIN, D. L., see HAMILTON, J. D. and others.
- *MORISON, C. Rutherford (with Ikpenic, J. O.). Vaginal avulsion complicating pelvic fracture. *Brit. J. Surg.*, 57, 1970, pp. 317-318.
- *MURLEY, R. S. (with Dempsey, E. F.). Vascular malformations simulating salivary disease. *Brit. J. Plastic Surg.*, 23, 1970, pp. 77-84.
- O'CONNELL, J. E. A. Cerebrospinal fluid mechanics. *Proc. Roy. Soc. Med.*, 63, 1970, pp. 507-518.
- O'GRADY, F., see HAMILTON, J. D. and others.
- OSWALD, N. C. and others. Relationship between breathlessness and anxiety in asthma and bronchitis: a comparative study. *Brit. med. J.*, April 4, 1970, pp. 14-17.
- PARE, C. M. B. and RAVEN, H. Follow-up of patients referred for termination of pregnancy. *Lancet*, March 28, 1970, pp. 635-638.
- PEMBERTON, J. Oesophageal obstruction and ulceration caused by oral potassium therapy. *Brit. Heart J.*, 32, 1970, pp. 267-268.
- *PERKINS, E. S. (with others). Serum immunoglobulins in retinal vasculitis. *Brit. J. Ophthalmol.*, 54, 1970, pp. 233-236.
- FRANKERD, T. A. J. (with Souhaimi, R. L.). Daunorubicin in acute leukaemia. *Postgrad. med. J.*, 46, 1970, pp. 272-275.
- , (with others). Diagnosis and treatment of primary polycythaemia. *Lancet*, May 23, 1970, pp. 1074-1077.
- RAVEN, Hermoine, see PARE, C. M. B. and —.
- RAWLINGS, Mary, see MILLBANK, L. and others.
- ROBERTS, M. E. with others. *Cardiobacterium hominis* endocarditis. *J. med. Microbiol.*, 3, 1970, pp. 91-98.
- *ROSS, A. P. Portal hypertension presenting with haemoperitonium. *Brit. med. J.*, Feb. 28, 1970, p. 544.
- *—, The fat embolism syndrome: with special reference to the importance of hypoxia in the syndrome. *Ann. Roy. Coll. Surg.*, 46, 1970, pp. 159-171.
- SALSBUURY, A. J. and CLARKE, J. A. New look at anaemia. *The Glaxo Volume*, 33, 1970, pp. 7-15.
- *SHINEBOURNE, E. A. (with others). Haemodynamic studies in hypertensive patients treated by oral propranolol. *Brit. Heart J.*, 32, 1970, pp. 236-240.
- , see also LIND, Norma, and —.
- *SIMON, G. Further observations on the long line shadow across a lower zone of the lung. *Brit. J. Radiol.*, 43, 1970, pp. 327-332.
- SPIRO, F. I. and FRY, I. Kelsey. Ureteric dilation in non-pregnant women. *Proc. Roy. Soc. Med.*, 63, 1970, pp. 462-464.
- STANFELD, A. G., see DYER, N. H. and others.
- *TAIT, I. Personal view. *Brit. med. J.*, March 28, 1970, p. 815.
- TAYLOR, Enid, see ADNITT, P. I. and —.
- THROWER, W. R. Agriculture and the public health. *Brit. med. J.*, April 11, 1970, pp. 69-74.
- TRICKLEY, S., see DU BOULAY, G. and —.
- TSAY, J. L., see CATTELL, W. R. and others.
- TURNER, P., see COUPAR, I. M. and —.
- *VALLOW, D. M. (and Brocks, B. E.). Establishments: the need for revolutionary action. *Physiotherapy*, April 1970, pp. 154-157.
- VERBOV, J. L., see DYER, N. H. and others.
- VINCE, Miss A., see HAMILTON, J. D. and others.
- , see also ZEEGEN, R. and others.
- WALLER, R. E., see LAWTHOR, P. J. and others.
- WATERS, A. H., see MILLBANK, L. and others.
- WATERWORTH, Pamela M. (with others). Serum streptomycin levels and dizziness. *Tubercle*, 51, 1970, pp. 76-81.
- *WATSON, B. W. The artificial kidney. *Bio-med. Eng.*, April, 1970, pp. 178-180.
- , see also MELDRUM, S. J. and —.
- WATTS, R. W. E., see GIBBS, Dorothy A. and —.
- *WELLER, M. A. Influenza in a school, 1969. *J. Roy. Coll. Gen. Practit.*, 19, 1970, pp. 26-28.
- ZEEGEN, R. and others. Some observations on the effects of treatment with lactulose on patients with chronic hepatic encephalopathy. *Quart. J. Med.*, 39, 1970, pp. 245-263.
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STUDENT HEALTH

by Roger Hurding

In the bewilderment of ward rounds, out-patient clinics and midnight confinements, the medical student ought to devote some time to thinking about his future career, and the possibility of work as a Medical Officer in the Students' Health Service ought to have more than a passing thought.

The historical growth of the Students' Health Service within the Universities of the United Kingdom has been extremely varied from one centre to another. In some of the smaller universities, such as Aberystwyth and Bath, the work is carried out on a part-time basis by a local General Practitioner or a Group Practice. Others have a team of doctors whose work is essentially advisory and who do not therefore have full medical responsibility for the students. At yet other seats of learning, the Medical Officer is the General Practitioner for the students in the full sense of the phrase, and this is the case at Bristol University where I work.

At the end of my first year as an Assistant Medical Officer, it may be useful to record some initial impressions of this type of work and to compare it with some of the salient features of General Practice, in which I worked for the previous seven years or so.

At Bristol we have a team of four full time doctors who have the medical care of up to 6,000 students (both undergraduate and postgraduate) and about 700 nurses at the Bristol Royal Hospitals. Compared with General Practice, this is a very generous Doctor: Patient ratio, and therein lies some of the attraction of the work. After the, often feverish, rush of seeing patient after patient in a crowded surgery, with one eye (or both!) on the clock in order to fit in so many visits before the next session, it is quite refreshing to have time to be thorough and circumspect in one's medicine. In Student Health work one has time to make that full neurological examination or psychiatric assessment, which so often in General Practice would have meant two hurried, inadequate interviews followed by symptomatic prescribing. It is not the General Practitioner's fault, but on many occasions the pressure of work means "short-cut" medicine.

We are particularly fortunate in Bristol in having an excellent rapport with the laboratory and radiological staff of the hospitals. Open access to their facilities means that we are able to investigate fully the diagnostic conundrums that we meet. Again, the good relationships with consultants and their junior staff are a stimulus to thought and care in one's clinical approach.

Another important facet of this work is the contact with the University authorities, lecturers and tutors. We feel at Bristol that we give the students a better service by not having medical responsibility for their mentors. The thought that he might sit opposite his Professor in the doctors' waiting room might put off the most determined student with a problem, especially if his problem is the Professor! Conversely, it is most important and helpful to be able to discuss with the academic staff when a student's illness is affecting his work or where his study is throwing up other problems of a psychological nature.

Let me now consider a little more closely the nature of the work. The medical care of students is really a

speciality in the sense that Paediatrics and Geriatrics are. Using similar Greek derivatives we might call this work Neosology and the medical officer a Neosologist! ("neos" I am told by learned Greek scholars is a "youth"). Patients aged between 18 and 25 or so present certain special features. This is of course one of the healthiest age groups and there is comparatively little pathology compared with the "cradle to the grave" spectrum of General Practice. One sees a great deal of the common everyday problems of upper respiratory infections, acne vulgaris, gastroenteritis and spasmodic dysmenorrhoea! One sees too those conditions which are a particular feature of the age-group such as athletic injuries, spontaneous pneumothorax, glandular fever and pityriasis rosea. Amongst these and in a wider medical field, one does meet some very interesting clinical material amongst students. Here are just two examples.

The first was a 20 year old, third year Law student who hitch-hiked back from Holyhead last November with symptoms of a Common Cold. One day later she complained of a sticky left eye and was troubled by a left frontal headache: there was a slight degree of ptosis. She was put on Penicillin and commenced inhaling. Only two days later she had a full blown chemosis with marked left proptosis and partial ophthalmoplegia. That same night, operation confirmed the diagnosis of pansinusitis with an associated left periorbital abscess. A trephine drainage of the left frontal sinus and orbit was carried out and a drainage tube placed in the left antrum. She was very fortunate not to have ended up blind in that eye and to have escaped a cerebral abscess. She is now extremely well, her only problem being a keloid scar over the frontal sinus; this will respond to plastic surgery!

The second example is a male student in his early twenties who came only a few weeks ago. During the previous week he had been troubled by vague discomforts in the region of his right ear and over the right mandible. As he was also undergoing dental care for a lower right molar he associated his symptoms with the affects of local anaesthesia. After a few more days he noticed an unpleasant tingling of the skin behind the right ear and the development of a few small spots. Concurrently he noticed a progressive weakness of the facial muscles of the right half of his face together with a numbness of the right side of his lips. When he came to see me he had a fully developed lower motor neurone right facial paresis and a cluster of the fine papules over the right mastoid process. Although I could see no lesions in the external auditory canal or on the right tympanum he clearly had a Ramsay Hunt's syndrome, due to Herpes Zoster of the geniculate ganglion of the right facial nerve. It is interesting that there is a case report in the *British Medical Journal* of 28th March, 1970 of a patient with a hemifacial palsy after an inferior dental block for dental treatment. However, it seems coincidental that the student was undergoing dental care as his hemiparesis was clearly due to Shingles.

There is a challenge too for diagnostic skill in dealing with the many Overseas' Students where Bilharziasis,

Tuberculosis or early Leprosy may lead to some puzzling symptoms.

Another aspect of Student Health work which needs clear thinking, empathy and the wisdom of Solomon is advice in the field of contraception, abortion and venereal disease. With the climate of lax sexual mores and relativistic thought in attitudes to life, there is a great challenge here for careful and compassionate appraisal and advice.

As in General Practice, a large proportion of patients in the University context come with social, psychological and psychiatric problems. Particularly as adolescence is a time of flux and development and also

because students are of the intellectual calibre which may lead to involved self-analysis, this is a time consuming, and yet worthwhile, part of the work. Anthony Ryle's recently published book "Student Casualties" is especially recommended for an insight into this field of Neosology.

In summary then, I would warmly commend Student Health work for your consideration. Although not as remunerative as many branches of Medicine, it is work of a fascinating nature with young, intelligent and often complex patients, in an environment which is a healthy stimulus to a thinking clinical approach.

THE INTENSIVE CARE UNIT

A Progress Report

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A three-bed Intensive Care Unit (I.C.U.), which was originally designated the "Respiratory Unit" was opened in the Hospital in December 1966. The original purpose of the Unit was to concentrate in one place all patients who required mechanical ventilation but, before very long, when the advantages of intensive care began to be realised, other patients began to be referred to the Unit including patients requiring individual monitoring for severe coronary disease.

A description of the Unit and an account of the work undertaken in the first year of its existence were recorded in this *Journal* in a previous article.¹ The purpose of this paper is to review the progress which has been made and the change in pattern in the work of the present Unit since that earlier report and to consider the developments which must take place in the Hospital in the field of intensive Care in the not to distant future.

Administration

Medical

The general administrative policy is unchanged from that described in the earlier article.¹ The Unit is supervised by a Consultant of the Department of Anaesthesia but the patients remain in the medical care of the admitting Consultant. The Resuscitation Registrar, a member of the Department of Anaesthesia, is responsible for the day to day co-ordination of the care of the patients in the Unit.

Patients may be transferred to the Unit at any time provided that there is a vacant bed. Transfer back to the admitting firm or department is by mutual consent. The policy of the Unit is to provide a service for the patients of other Departments. The mutual exercise in co-operation has invariably been happy and successful.

Many special Departments give unstinted assistance to the Unit. These include the Department of Thoracic Surgery, who have given much helpful advice and perform the majority of the tracheostomies required, the Departments of Physiotherapy, Neurophysiology, Psychiatry and Medical Electronics, the Renal Unit, the Anaesthetic Research Laboratory and the various Pathological and Bacteriological services.

Sessions in the I.C.U. have been included as part of the undergraduate teaching programme of the Department of Anaesthesia for over a year.

Nursing

The single most important development in the Unit since the last report has been the appointment of a Sister to the Unit which has enabled nursing continuity to be maintained and greatly improved training. The establishment consists of six staff-nurses and two student nurses in training. Staff nurses usually do a tour of four months while students are with the Unit for two weeks. A rule of having not less than two nurses in the Unit at any time is maintained. Intensive care nursing makes great demands on the individual both physically and psychologically. There is no doubt that the nurses who have served and are serving in the limited physical facilities of the present Unit have maintained the highest traditions of their profession.

Accommodation

The present Unit has a floor area of approximately 300 square feet (28m²). Three beds are accommodated within this space as well as a nursing station and a number of cupboards for the storage of equipment. A B.M.A. report² recommends that every intensive care

TABLE 1
PATIENTS TREATED IN THE I.C.U.

	1967		1968		1969	
	Admitted	Survived	Admitted	Survived	Admitted	Survived
POST-OPERATIVE	29	42	41	63	41	67
OBSTRUCTIVE LUNG DISEASE	9	70	14	70	5	69
MYOCARDIAL INFARCTION (post arrest)	9	67	16	63	21	57
MYOCARDIAL INFARCTION	0	—	14	52	9	67
C.V.A.	6	17	3	67	0	—
SHOCK	5	100	26	100	12	100
MISCELLANEOUS	15	67	9	75	30	67
TOTAL	72	60	112	69	117	70
Bed occupancy	61%	—	74%	—	73%	—

TABLE 2
MISCELLANEOUS MEDICAL CONDITIONS TREATED IN THE I.C.U.

RENAL FAILURE (2)	HEPATOIRREGALY & HEPATIC FAILURE
STATUS EPILEPTICUS (2)	CIVILURA
MYASTHENIA GRAVIS (1)	SUBACUTE BACTERIAL ENDOCARDITIS
Dose each of the following:	
MEASLES	HEPATOIRREGALY & HEPATIC FAILURE
ANAPHYLACTIC SHOCK	CIVILURA
HYPERTENSIVE ENCEPHALOPATHY	SUBACUTE BACTERIAL ENDOCARDITIS
FOOD INTOLERANCE	DIABETES
ECLAMPSIA	CRISTANIS
ACUTE PNEUMONARY OEDEMA	VENTRICULAR TACHYCARDIA
SUBACUTE ENPHLOTTITIS	HEMATEMESIS

Note: Conditions mentioned by name in Table 1 are not included

bed should be allotted a space of 200 to 300 square feet (18.5 to 28m²). It therefore follows that, if the administrative space is considered, the bedside at present occupies about one quarter of the optimum area. A great deal of ingenuity has been required to cram a "half-a-gallon into a pint pot" (or perhaps more correctly in these days "two litres into a 0.5 litre flask").

Considerable improvements in working conditions were, however, achieved during a major refit of the Unit including the installation of an air conditioning unit which was undertaken by the Clerk of the Works in December 1968. The storage problem was also greatly eased by the building of a Unit Store in a section of the underground Central Equipment Store.

The chief need at the moment is for cubicle facilities for isolating infected cases but division of the present Unit by any form of partition is not practicable because of the small space available.

Equipment and Facilities

The equipment has been steadily improved as money has become available. Each bed is kept in constant readiness to receive a patient requiring mechanical ventilation with an East Radcliffe ventilator or humidified oxygen therapy and with facilities for monitoring the electrocardiogram (E.C.G.), the arterial blood pressure (B.P.), and the Central venous pressure (C.V.P.) as well as the more usual nursing parameters of temperature, pulse, respiration and urinary output. In addition, with the close co-operation of the various Departments already mentioned, electroencephalography (E.E.G.), blood gases and other pathological investigations are readily available. The system of charting was described in the previous article and continues substantially unchanged.¹

Results

Bed Occupancy

An average bed-occupancy figure of 60% is regarded as acceptable for an I.C.U. because of the unavoidable fluctuation in demand for its services.² Table 1 shows that an occupancy of 75% was achieved in the Hospital Unit in 1969 compared with 60% in 1967 and that the

number of individual patients treated has risen from 72 in 1967 to 117 in 1969.

It should be remembered that there are many periods particularly in winter, when patients requiring intensive therapy (especially mechanical ventilation), cannot be admitted to the I.C.U. because it is already full and have to be treated elsewhere. There are many other patients especially post-operative cases for whom there is not room in the I.C.U. but who would benefit from supervision and treatment in the Unit.

Duration of Stay in the Unit

The majority of patients stay in the Unit for from one to five days. Eight patients (7% of admissions) stayed for over 21 days in 1969 compared with five (45%) in 1968 and 9 (12.5%) in 1967 and the average duration of stay has fallen from 10 days in 1967 to 6 days in 1969. This constitutes a considerable increase in turnover and efficiency of service.

Conditions Treated in the I.C.U.

The Unit accepts patients of both sexes with a wide variety of conditions (table 1).

The largest group has continued to be those requiring intensive post-operative care. In 1967 these constituted 40% of cases admitted (29 cases) in 1968 36.5% (41 cases) and in 1969 34% (41 cases). The vast majority of these patients required mechanical ventilation for varying periods. With increasing skill in the care of patients on ventilators a greater number of cases have been ventilated through an endotracheal tube without recourse to tracheostomy (35% required tracheostomy in 1967, 11% in 1968 and 16% in 1969).

There has been a steady decline in the number of patients admitted for the treatment of obstructive lung disease unassociated with operations (1967: 12.5% of cases, 1969: 4.3%). This in contrast to an increase in the "miscellaneous group" comprising a variety of general medical conditions (table 2).

Prognosis of patients admitted to the Unit

The overall survival rate of patients admitted to the I.C.U. was 60% in 1967, 69% in 1968 and 70% in 1969. This probably reflects the fact that less severely ill

TABLE 3

POSTOPERATIVE PATIENTS TREATED IN I.C.U.

	1967		1968		1969	
	Admitted	%Survived	Admitted	%Survived	Admitted	%Survived
LOWER ABDOMINAL	2	0	10	80	9	44
UPPER ABDOMINAL	5	60	7	75	9	78
COLONIC SURGERY	2	100	4	75	8	100
HEPATIC SURGERY	4	50	1	100	2	50
VASCULAR SURGERY	8	25	13	67	9	56
MISCELLANEOUS	8	38	5	40	4	75
TOTALS	29		40		41	

patients are now often transferred to the Unit than was formerly the case as well as increasing experience (table 1).

There has been a steady improvement in the survival rate of post-operative patients from 42% in 1967 to 62% in 1968 and 73% in 1969. There has been little change in the type or severity of operation which these patients have undergone (table 3) except that the number of patients who have been admitted following excision of the colon has gradually increased.

One of the most important duties of the Resuscitation Registrar is the immediate treatment of cardiac arrest in the wards. Most of those patients who survive are transferred to the I.C.U. for further observation, monitoring and therapy. The survival rate of those who are transferred to the Unit has remained fairly constant (67% in 1967, 63% in 1968 and 57% in 1969).

In 1967 it was not the policy of the Unit to undertake prophylactic cardiac monitoring of patients who had suffered myocardial infarction but who had not suffered actual cardiac arrest. This policy was changed in 1968 when the Unit undertook to care for any coronary patients who were transferred. Fourteen cases were admitted in 1968 (50% survival) and 9 in 1969 (67% survival). Thirty-three cases were admitted to the Unit with drug overdose during the period covered by this report (December 1966 to December 1969) and all of them survived.

The Future

It is now generally believed that Intensive Care must be linked to "Progressive Patient Care" in hospital organisation.³ That is to say that patients should progress through or be admitted to "Intensive", "Intermediate" or "Minimal" care areas according to the nature and severity of their illness, and the intensity of the nursing supervision which they require.

Intensive Care areas require a high nurse to patient staff ratio (at least one to one) whereas Minimal Care areas, catering for up-patients, require only a few nurses supplemented by housekeeping staff. A system of this kind is designed to ensure that the skills of nursing staff are concentrated and applied where they are most

needed and with the greatest efficiency.

Historically, "Intensive Care" developed from post-operative "Recovery" care but most authorities would now agree that relatively fit surgical patients requiring close supervision for a matter of minutes or hours until they regain consciousness should be accommodated in separate Short-Term Recovery Units and then returned to Intermediate Care. Post-surgery patients requiring more prolonged supervision can be accommodated in a General Intensive Care Unit.

There are, however, certain types of patient who are best accommodated in Special I.C.U.s. The largest group in this category are cardiac patients. A Coronary Care Unit (C.C.U.) should lay emphasis on monitoring and prevention of cardiac arrest rather than the treatment of cardiac arrest after it has occurred. A busy General I.C.U. is hardly the most ideal place for monitoring and treating acute myocardial infarction.

Other cases requiring specialised intensive care units are emergency admissions, burns, and patients undergoing chronic dialysis. The nursing skills and the services required by these individual units have, however, much in common and there is much to be said for grouping them together in a "Therapy Block" in modern Hospital design as has often been done in Scandinavia.

The need for a change to Progressive Patient Care has already been approved at this Hospital. The plan includes an enlarged I.C.U. of 10 beds, with isolation facilities, an Emergency Admissions Unit (10 beds), a Coronary Care Unit (C.C.U.) of 6 beds and a Minimal Care Area of about 50 beds. It is probable that the C.C.U. will be functioning within the next 12 months.

Conclusion and Summary

The work of the Intensive Care Unit during its first 3 years has been described. The Unit has justified its existence as an area where seriously ill patients can receive concentrated nursing and mechanical support including mechanical ventilation. The future development of Intensive and Progressive Patient Care are discussed with special reference to St. Bartholomew's Hospital.

REFERENCES

- MISSEN, J. C., and BOULTON, T. B. (1968) The Respiratory Unit—the First Year. *St. Bartholomew's Hospital Journal*, 72, 209.
- B.M.A. Planning Unit (1967) Report of the Working Party on Intensive Care.
- WIKLUND, P.E. (1969) Intensive Care Units: Design, Location, Staffing, Ancillary Areas, Equipment; *Anesthesiology*, 31, 122.

BOOK REVIEWS

Urology for Nurses by J. P. Mitchell, 2nd Edition. Publishers: John Wright and Sons. Price 35s.

With more surgeons specialising in Urology there is a real need for an up-to-date book on this subject.

This is the second edition, and has many new additions. The chapter on Anatomy and Physiology is clear and easy to understand with the help of good diagrams. The book is well set out, easy to read, with plenty of good diagrams and illustrations. Few nurses will have the opportunity of working in a dialysis unit, but will see patients in the surgical and medical wards prior to this procedure.

In this book the section on Acute-Chronic Renal Failure and dialysis is very good and will enable all nurses to grasp the principles of dialysis and electrolyte balance. The Author has deliberately omitted all pre- and post-operative care, as he states quite correctly that these are continually changing. For the ward nurses some of the information is inadequate and more detail would have been useful.

There seems to be too much space taken up in this small book with detailed descriptions of Cystoscopes and instruments which will be of use to nurses working in endoscopy theatre only.

This book is a useful addition to a nurses library; kept on the ward it provides accurate and up-to-date if somewhat brief information on the subject of Urology for nurses.

SISTER BOWLBY.

"Poems from Hospital" by Jean and Howard Sergeant. (George Allen & Unwin Ltd., 1968).

This is a delightful book, it has something for everyone: for the occasional patient, bewildered by the complexities of modern hospitals, for the chronic invalid who spends years within their portals, and for those whose whole life is devoted to hospital. Hardly a corner of the place is left out. Whatever investigation, whatever department you visit, whatever treatment you face, you will find it all within these pages. Tssimond's "The Psycho-analyst" rings a familiar bell. "His suit is good, his hands are white. He smiles all day, he sleeps all night. Because he's always, always right". Those who have ventured to sleep in a busy ward, will read Douglas Gibson's "Hospital at Night" with a smile, "How quiet, how quiet, the hospital sleeps . . .". This well arranged selection is so strangely true, and the very uniformity of the pattern of hospital life is evident within its pages.

IAN MCCOLL.

Lectures in Chest Medicine by J. Edge, M.D., M.R.C.P. Staples Press, 75s.

This excellent short book on Chest Medicine can be thoroughly recommended either as an introduction to the subject or for revision purposes before examinations. The first chapter on radiology is illustrated by helpful line diagrams, and the second on carcinoma of the lung is notable for its sensible introductory remarks on aetiology with particular reference to cigarette smoking. The chapter on Tuberculosis mentions the relative value of pre-chemotherapy treatments now only of Historic interest, but whether the view implied, that all Pneumothorax and Resection treatment was in effect valueless, is open to argument. If one interprets the recommended scheme of chemotherapy correctly, it involves giving all patients 3 drugs, including Streptomycin, daily (except Sundays) for one year, which means a total dosage of this drug of some 300 gm. which will surely cause toxic effects, possibly lasting, in some patients. A chapter steers us helpfully through the still incompletely charted seas of the numerous lung conditions related to disorders of immunity including Asthma; with regard to the treatment of this condition, perhaps Hypnotherapy would be worthy of mention.

Chapters follow on Emphysema, Chronic airways obstruction, Sarcoid disease, and the Pneumoconioses. In the latter chapter attention is drawn to the recently discovered association between asbestos exposure in heating and ships engineers and Mesothelioma of the pleura.

This book is expensive at £3 15s. 0d. but it is also available in a less durable paperback form, considerably more cheaply.

W. F. SNELL, M.D., F.R.C.P.

Fairbrother's Textbook of Bacteriology. Edited by R. L. Vulliam, M.A., D.Phil., Oxon.; D. G. Jamison, M.A., B.M., Oxon.; C. S. Cummins, Sc.D. 10th edition, p.p. viii + 447. 40s. William Heinemann Medical Books Limited.

The first edition of this book was published in 1937, and for many years it has rightly been a favourite book with medical students. Professor Fairbrother died in 1969, and this edition, published as a paperback, has been taken over by a new team.

The arrangement remains conventional. Part I covers general aspects of bacteriology, including chapters on the morphology and behaviour of bacteria, sterilisation, chemotherapy, and immunity and hypersensitivity.

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Part II is headed Systematic Bacteriology and is divided into chapters on bacteria, viruses and rickettsiae. Part III contains four chapters on technique.

Although there is much new material, parts of this book need revision to bring it up to date. The section on sterilisation completely ignores the great changes that have taken place in autoclaves in the last ten years, and now that bovine tuberculosis has been practically eradicated in this country it will no longer do to say that the control of this disease rests on pasteurisation or boiling the milk in the home. Few bacteriologists, too, would advocate drinking unpasteurised milk even when it was shown to be free of tubercle bacilli.

PROFESSOR SHOOTER.

The Diagnosis and Treatment of Diseases affecting the Nervous System by Frederick Lees, M.B., M.R.C.P., D.C.H., M.P.S. 2 volumes. Staples Press, 1970. 160s. a volume.

The theme of this new textbook by Dr. Lees, who has been senior registrar in neurology at Bart's, is the diagnosis of affections of the nervous system as encountered in non-specialist hospitals and in the home of the patient. The arrangement of the book is unusual. The first volume contains two parts, the first is an analysis of symptoms of neurological disorders with discussion of their causes in terms of physiology and pathology, and the second part an account of special investigations used in neurological diagnosis. The second volume contains a systematic account of neurological diseases. This method of presenting the subject inevitably means a certain amount of repetition. The writing is concise and clear and the clinical description excellent but less attention is given to the basic facts of anatomy, physiology and pathology than in some neurological textbooks. There is a list of references for further reading, an excellent index and adequate illustrations. Dr. Lees has written an admirable book; unfortunately it is rather too long and indeed expensive for most students, but it will be of great value to graduates working for higher examinations and to consultants in many branches of medicine and surgery, including neurologists.

J. W. ALDRIN TURNER.

"Alcoholism Explained" by Dr. Lincoln Williams. An Impact Paperback, published by Evans Brothers Ltd., London. 127 pp. 6s.

This highly readable paperback is aimed at anyone who has come across the problem of alcoholism, in their work or in everyday life. Dr. Williams starts with two chapters which attempt to define what an alcoholic is, and then proceeds to discuss the disease concept of alcoholism, its aetiology and sociology. Throughout the book he maintains an unusually well-balanced picture of prognosis and treatment.

My only small criticism would be that the author tends to fall between two stools. I felt the section on the Psychology of Alcoholism would be too technical for the lay reader, yet tantalising sentences such as "The psychopath not only becomes addicted to alcohol very easily but he is frequently a drug addict as well" remain without qualification.

This book only costs six shillings. The section on "How to Approach an Alcoholic" should be compul-

sory reading for every person in a medical profession which seems unable to come to terms with a disease affecting half a million people in this country.

W. E. J. LEVERTON.

John of Mirfield (d. 1407) Surgery. A translation of his *Breviarium Bartholomei*, part IX by James B. Colton. With an introduction by Frank B. Berry. Published under auspices of the Library of the New York Academy of Medicine. New York, Hafner, 1969. Pp. xix, 230. + 9 illustrations. £4 14s.

John of Mirfield, or Johannes de Mirfeld, was connected with St. Bartholomew's Priory and Hospital at the end of the fourteenth and beginning of the fifteenth centuries, but little is known of his life, except that he was the author of *Florarium Bartholomei*, a theological treatise with one medical chapter, and *Breviarium Bartholomei*. This is an encyclopaedia of contemporary medicine gathered from various sources, and probably compiled between 1380 and 1395. Two contemporary manuscripts of this exist, one in the British Museum and the other at Pembroke College, Oxford. Covering about 2,700 pages, this has never been completely translated, but sections of both the *Florarium* and *Breviarium* were made available in translation by Sir Percival Horton-Smith Hartley and Harold Richard Aldridge in *Johannes de Mirfield of St. Bartholomew's, Smithfield; his life and works*, Cambridge, 1936.

It is probable that John of Mirfield was outstanding among medical men of his period. Although lacking formal training, he read widely and wisely, emphasising symptoms and diagnosis, citing the use of charms and incantations, but doubting their efficacy, and giving the normal prescriptions of the period, which are generally omitted in this translation, which is of only part nine of the Pembroke College, Oxford manuscript of the *Breviarium*. It consists of eight Divisions, each comprising several chapters, and is devoted to wounds and fractures, animal bites, concussion, burns, ulcers and effective medicines for the cure of wounds, Albucahis, Lanfranc and Galen are among the authorities quoted, and this work mirrors English medicine of the period. James Colton, who is classics master at Albany Academy, previously translated *The Surgery of Theodorici*, and is obviously competent at translating medical writings from the Latin. While we welcome the availability of this text in English, it makes us greedy for more. The translator prepared this as a labour of love, and probably considered himself rewarded by the achievement. Surely the writings of John of Mirfield, so closely associated with St. Bartholomew's Hospital, and typical of medicine of the fourteenth century, should be made available in their entirety in English? Could not Mr. Colton be persuaded to undertake a complete translation, or at least extend his scholarly pursuits to encompass further Parts of *Breviarium Bartholomei*?

JOHN L. THORNTON.

Penguin Modern Stories 3. 4s.

This volume contains works by Philip Roth, Margaret Drabble, Jay Neugeboren and Giles Gordon, Philip Roth (the author of Portnoy's complaint) and Margaret Drabble, explore in their own way the hang-ups of modern marriage; Philip Roth in a rather disquieting manner and Margaret Drabble with a more philo-

sophical approach. "Joe", by Jay Neugeboren is a youthful reminiscence just capturing the essence of the hot, claustrophobic yet carefree days in the city. "Finkel" describes the presumptions of a working-class Jewish janitor towards a Professor on Freud regarding their common heritage.

Also contained are two short pieces by Giles Gordon. To call them short stories is questionable as neither expresses a sequence of events or thoughts with the conventional beginning and end. Instead both appear to be collections of alliterative, assonant phrases, and similes drawn from two particular paintings by Bacon and Nikolais. On first reading, I felt that I needed some concrete imagery to compare my impressions with; a photograph of the paintings seemed the most obviously suitable and yet no photograph was included.

Individual words are meaningless unless they communicate ideas, emotions or facts, and this can only be achieved within an overall grammatical structure by whole collections of words and phrases. It seems to me that Giles Gordon is not interested in the conventional communicative value of words, but in analysing their sounds and shapes. As the artist works within the framework of his canvas, so Giles Gordon works within his syntax. But just as the colours within a picture may of their own create a visual and emotional sensation, so I think Giles Gordon has attempted to use words.

The first short story involves a trapeze. The word trapeze conjures up a definite impression, and it is with its conventional meaning that it is introduced. But note, the author then writes:—

Trap—a device for catching

Ease—freedom from pain or disturbance, a rest from work.

The insertion of this at a place in the writing where it seems totally irrelevant, makes the use of the word itself appear meaningless. So—forget the normal connotations—try and feel the sound and shape of the word, its dimensions. This I think is the author's purpose in writing. As a consequence most of his writing is lyrical and rhythmic in quality.

It may be that the author is fooling himself, or we ourselves are making a great mistake in reading too much into his work. For it is not so easily possible for

words—as used by Giles Gordon—to traverse the conscious boundaries they would have to pass, whereas music and painting can appeal directly to the subconscious emotions. All in all however, Giles Gordon was interesting reading.

M. C. WHITE.

Someone Like You. Roald Dahl. Penguin. 6s.

Roald Dahl has been writing since the war, and besides other collections of short stories such as *Kiss Kiss*, he has written many entertaining and original children's stories; *James and the Giant Peach*, and *Charlie and the Chocolate Factory*. *Someone Like You* is a collection of short stories first published in 1954 and now reissued by Penguins.

Several of his stories are written with a strong sense of black humour. They are composed of very simple themes, as in the first story, which progresses from an almost trivial to a knife-edge situation, concerning a gambling stockbroker whose previous dinner-party bets have only involved cases of Burgundy, but who finds himself, in a moment of heat, wagering his daughter against the wine-tasting abilities of a "bon viveur". The situation builds up with an intensity that makes you rush through as the tension mounts. Finally the author leaves you at the climax with mouth agape.

He impresses with his intimate knowledge of the human personality, its emotions, conflicts, reactions and foibles: describing how an ordinary degree of pride can become dangerous stupidity; how an imaginative inventor loses his objectivity and finishes up in a mental home; how a rat catcher takes on the insidious evil guise of the animals he is paid to kill. Roald Dahl constructs brilliant characterisations of his subjects, building up their personalities slowly and just as surely involving you in their story. His imagery and imagination is good. The result for the most part is compelling reading, although not all his stories succeed. Nevertheless they are entertaining—and leave you with just a little feeling of unease. You finish each with just enough relief to hurry on to the next.

M. C. WHITE.

GAINSBOROUGH EXHIBITION
AT THE QUEENS GALLERY, BUCKINGHAM
PALACE

Yvonne Hibbott



THOMAS GAINSBOROUGH

Queen Charlotte

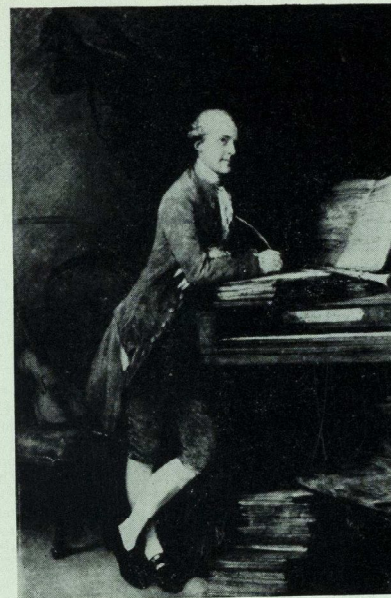
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Her Majesty The Queen)

Many artists have painted bread-and-butter portraits which have been quickly forgotten—not, however, the portraits by Gainsborough which include some of the greatest works in English painting. Because he was unable to sell his landscapes Gainsborough had, of necessity, to concentrate on the portraiture of wealthy patrons and their families. A fine selection of these portraits in the Royal Collection is now on view at the Queen's Gallery, Buckingham Palace.

Gainsborough was a successful portrait painter first at Bath (1759-1774), and later in London (1774-1788). While still at Bath he was able to charge sixty

guineas for a half length portrait and a hundred guineas for a full length. Paintings in the exhibition are from the London period when Gainsborough was already well established and a rival to Reynolds.

The arresting beauty of the portrait of Queen Charlotte is sheer genius. No royal aloofness here—the Queen is a warm, gentle woman. She is dressed in a panniered muslin dress richly embroidered in gold. It is difficult to believe that Gainsborough and his nephew Gainsborough Dupont completed the painting of the gown in one night so that the work would be finished in time to be exhibited at the Royal Academy.



THOMAS GAINSBOROUGH

Johann Christian Fischer

(Reproduced by gracious permission of
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The exhibition is worth visiting if only to see the set of fifteen portraits of the Royal Family (George III, Queen Charlotte and their children). The oval-framed portraits are arranged as Gainsborough requested they should be hung at the Royal Academy in 1783—in three rows of five with the frames touching. The portraits of the Prince of Wales and the three Princesses were thought to be the best likenesses.

Another fine portrait is "The Three Eldest Princesses: Charlotte, Princess Royal, Augusta and Elizabeth". Tragedy befell this painting—originally a full length it was cut down to fit over a doorway. How the painting appeared formerly can be seen from Dupont's engraving (No. 56). The three figures are skilfully grouped and the dresses blend in a harmony of colour—mauve, creamy-gold and turquoise.

Gainsborough's portraits have all the elegance and grace of Van Dyck (an artist he greatly admired) combined with a more naturalistic approach. The portraits of Gainsborough's later years became less substantial, much more impressionistic, and have been called "strange airy stuff" This technique can be seen in the oil sketch of Mrs. Mary Robinson ("Perdita").

One of Gainsborough's best portraits is of his son-in-law, the musician Johann Christian Fischer. The full-length portrait shows Fischer leaning on a harpsichord and surrounded by music and instruments. Fischer married Gainsborough's younger daughter Mary, against her father's wishes. Unfortunately the marriage was unhappy and lasted only a few years. Gainsborough admired Fischer as a musician but not as a person.

To obtain the light, rhythmic brushwork of his paintings Gainsborough used very long brushes and diluted the paint with turpentine to the consistency of watercolour. Because of this uncomplicated technique his works are in a finer condition than those of most eighteenth-century British painters.

Gainsborough succeeded equally well in portraiture and landscape painting, so that even his pompous rival Reynolds had to admit:—"We may justly say that whatever he attempted he carried to a high degree of excellence."

[The exhibition will be open until the end of the year. Hours of opening:— Tues.-Sat. 11 a.m.-5 p.m. (closed Mondays), Sun. 2 p.m.-5 p.m. Admission 3s. (students 1s.)]

SPORT

BOAT CLUB REPORT

After the successes of our first two crews in the Bumps, it was a great pity that neither crew could be kept together. The first eight have dispersed to row for the University, to climb mountains, and in one case, to take 2nd M.B.: Good luck, Tom!

The second eight have been rowing as two fours. The first crew raced at Wallingford in Novice Fours, but lost in the first round to the eventual winners (the home club, fix fix) in the second fastest time of the day. Next week, at Cambridge regatta, they defeated a huge entry at the largest regatta of the season, to win the Novice Fours event; spurred on by this they competed at Brent regatta two days later, and reached the final of the Junior fours, losing to the same crew who defeated them in the final at Hammersmith. At Evesham the next week they lost in the first round, though presenting a plethora of excuses as to why this occurred.

The second Novice four have not been taking things so seriously, but had enjoyable outings to Cambridge and Brent.

Winning crew at Cambridge: J. Close, bow; S. Whiting; A. Gray; T. Coyle, stroke; I. Binteliff, cox.

HOCKEY CLUB REPORT

United Hospitals Junior Cup Final

St. THOMAS' 1, BART'S 4.

This final, played at St. Thomas' Cobham ground, was evenly fought for the first twenty minutes. St. Thomas', however, went into the lead at this stage with a fine shot from half-way inside the circle. They failed, however, to withstand a period of strong Bart's pressure and Coleman equalised with an equally fine shot, from nearly the same position at the other end.

H.T.—St. THOMAS' 1, BART'S 1.

Bart's pressed strongly from the outset and were rewarded when St. Thomas' gave away an own goal. It was then Bart's turn to defend for a while, they did this well, and then broke through defence for Ashton to shoot what seemed a certain goal. A defender, however, stopped the ball on the line, with his foot, and it was left to Coleman to convert the penalty-flick. St. Thomas', pressing strongly, were again well held by Bart's and Lunt, with a fine solo-run from the half-way line, beat a defender and the goalkeeper to put the Cup beyond St. Thomas' reach. In the dying minutes House made a brave save to deny St. Thomas' a closer score-line.

Team:— House, Foster, Dodson, O'Donovan, Smyth, Hughes, Spencer, Coleman, Lunt, Ashton, Bates.

All that remains is to persuade Guy's to hand over the Cup.

J. H. HOUSE.

CRICKET CLUB

So far this season we have been blessed with some good cricketing weather and the results have been quite favourable. We have won four, drawn one and lost two. We are also fortunate in that this year we can call upon more than the average number of players from the freshers. In the Hospitals' Cup we have reached the semi-final which will be played against the Middlesex Hospital on Tuesday, 2nd June.

The first match of the season was against Sussex University but unfortunately, being a Wednesday fixture, we had to put out a somewhat weakened team and so lost by 54 runs (Sussex 106-8 dec.; Bart's 52).

The second fixture was a new one this season, against "Old Erithians". Unfortunately, however, for a new fixture the game resulted in a rather prolonged draw (Bart's 107; Old Erithians 63-4).

The two games against Southend were very evenly balanced. The first we won by 6 wickets with both Purcell and Furness completing fifties (Southend 167-5 dec.; Bart's 168-4). The return fixture Southend won by 5 wickets (Bart's 130; Southend 133-5).

A very enjoyable afternoon and evening were spent in one of our more "social" games, against Chrisshall. We won this game fairly convincingly by 107 runs. Cooper and Findlay-Shirras, both newcomers this year, batted very well and Lloyd in his first game of the season got 5 wickets.

2nd Round of the Hospitals' Cup Bart's v. the London Hospital

This game was played on the London Hospital ground in weather that can only be described as oppressive. We batted first and after a relatively disastrous start (at one stage we were 68-5), we were eventually able to muster 182, thanks mainly to a fine 60 from Rowland who was last man out. The London found themselves in a similar situation to ourselves, being 73-5, but were unable to find somebody to stabilise the score as we had done, and they were all out eventually for 146, leaving us victors by 36 runs. Berstock bowled very well to end up with 5-45.

Bart's

D. Lindsell, c. Ross, b. Bell	20
R. Firmin, c. Ross, b. Smith	26
P. Furness, c. MacFarlane, b. Bell	0
J. Ussher, b. Smith	0
C. Reid, c. Forsyth, b. Chowdery	26
N. Findlay-Shirras, c. Ross, b. Smith	14
E. Rowland, c. Ross, b. Gould	60
D. Berstock, c. Boler, b. Chowdery	15
S. Davison, c. Chowdery, b. Bell	2
E. Lloyd, b. Smith	8
I. Hann, not out	8
Extras	3
Total	182

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ATHLETIC CLUB

U.L. Championships, Mootspur Park, 24th-25th April

Bart's was represented by a small team in the first match of the season. The first event was the 100 metres in which John Payne was unlucky not to reach the final. The 800 metres saw Mike Erith and Richard Moody both excel themselves, with Mike qualifying easily for the final. Paul Bebbington retained his Discus title and was selected to represent the University for the rest of the season.

On the second day Mike Erith ran an extremely good race to come third in the 800 metres. In the 1500 metres J. Brooks was 2nd and D. Pinkard 4th; both ran for the University later in the season. In the 3000 metres steeplechase Mike Page came 4th in his first track race for the Hospital.

This was quite a good performance by the team but if more athletes turned out we could do even better.

Bowling: Smith 4 for 42; Bell 3 for 55; Gould 1 for 55; Chowdery 2 for 27.

London Hospital

J. McHardy, run out	8
M. Forsyth, b. Berstock	6
P. Boler, c. Firmin, b. Berstock	19
C. Chilton, c. Reid, b. Hann	8
P. Ross, b. Berstock	46
F. MacFarlane, c. Rowland, b. Lloyd	14
B. Russell, c. Ussher, b. Lloyd	6
M. Bell, b. Rowland	13
D. Chowdery, b. Berstock	7
P. Gould, c. Firmin, b. Berstock	6
M. Smith, not out	3
Extras	10
Total	146

Bowling: Rowland 1 for 33; Davison 0 for 12; Berstock 5 for 45; Hann 1 for 25; Lloyd 2 for 22.

Bart's 87th Annual Sports Day, 30th May

Fine weather, good publicity and free beer, brought out a crowd determined to enjoy themselves, which they certainly did. What a difference from recent wet, dismal Sports days.

The results: Taylor dominated the sprints, winning the 100, 220 and 440 yards. The Millards and Bebbington wrapped up the field events and Brooks and Moody the middle distance events; mention should be made of "old lags" Stevens and Hellier, who won the Shot and High Jump respectively.

A very successful innovation was the tug-of-war. To calls of "Take the strain" and "Heave, heave!" Howie Scarffe's finalists defeated a strong (numerically!) pre-clinical team and a registrars' team. A decided advantage in pulling downhill helped to swing the results!

The consultants 100 yards was a very tense affair;

after one false start Mr. McColl eventually streaked away from the field with Mr. Charlton chasing up in second place.

Ten teams were entered for the inter-firm relay, and six qualified for the final. The registrars, apparently unable to differentiate between the sexes, reached the final with a team of four men! However, they managed to find two women for the final, where they were unplaced, the winners being the second year pre-clinicals.

We would like to thank everyone who came down and competed or supported; Mr. McColl (President of the day) and his family, for attending; and George Blackledge for the commentary. We hope that future Sports days will be as enjoyable, not just as an athletics fixture but also as a social event for all members of the Hospital, their families, and friends.

RESULTS OF EVENTS AT SPORTS DAY

110 yds. Hurdles: 1. N. Millard, 19.0 sec.; 2. C. Hunt, 19.1 sec.
100 yds.: 1. P. Taylor, 10.9 sec.; 2. S. Slaffer; 3. R. Lambert.
220 yds.: 1. P. Taylor, 26.8 sec.; 2. A. Breeson; 3. R. Moody.
440 yds.: 1. P. Taylor, 55.8 sec.; 2. R. Moody; 3. B. Campbell.
880 yds.: 1. R. Moody, 2 min. 13.6 sec.; 2. R. Hale; 3. M. Page and B. Campbell.
1 mile: 1. J. Brooks, 4 min. 40 sec.; 2. C. Phillips; 3. G. Clark.
3 miles: 1. J. Brooks, 15 min. 49 sec.; 2. R. Miller; 3. R. Moody. D. Jackson also ran.
Long Jump: 1. N. Millard, 19ft. 4in.; 2. C. Hellier, 17 ft. 10in.; 3. P. Millard, 17 ft. 8in.
High Jump: 1. C. Hellier, 5 ft. 3in.; 2. N. Millard, 4 ft. 11in.; 3. G. Aiken, 4 ft. 9in.
Javelin: 1. P. Millard, 140 ft. 6in.; 2. N. Millard, 131 ft. 5in.; 3. C. Phillips, 123 ft. 11in.
Shot: 1. J. Stevens, 34 ft. 4 in.; 2. P. Millard, 33 ft. 4 in.; 3. G. Aiken, 32 ft. 7½ in.
Discus: 1. P. Bebbington, 125 ft. 9in.; 2. C. Hellier, 102 ft. 4in.; 3. G. Aiken, 100 ft. 6½ in.
Ladies' 100 yds.: 1. Marilyn Bond; 2. Hilary Warren; 3. Barbara Appleby.
3-legged Race: 1. D. Lyth and A. Cadier.
Tug-of-War: 1. Finalists.
Senior Egg and Spoon: 1. K. McIntyre; 2. R. Lambert; 3. N. Snell.
Consultants' 100 yds.: 1. I. McColl; 2. C. Charlton; 3. L. Dowie.
Children's Egg and Spoon: 1. S. Charlton; 2. C. McColl; 3. C. Charlton.
Children's 50 yds.: 1. M. Dowie; 2. A. McColl; 3. A. Dowie.
Inter-firm Relay: 1. 1st year 2nd M.B.; 2. Finalists; 3. Dr. Hayward's Firm.

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Applicants should state for which post they wish to apply and give a second choice.

The posts are tenable from 1 December, 1970, and the Salary Scales are those of a Senior House Officer in the National Health Service.

Applications, with the names of two referees, should reach the undersigned by Monday, 7th September, 1970. (Application forms are available from the Medical Staff Office.)

Further information may be obtained from the Professor of Surgery or from the Medical Staff Office.

J. W. GODDY,
Clerk to the Governors.

- * Urology
- Orthopaedics
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met/rmb
August 1970

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SAINT BARTHOLOMEW'S HOSPITAL JOURNAL

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Editorial

In a talk delivered to the Hospital and Medical College staff and students on July 6th, the Dean, Dr. J. S. Malpas, outlined the future plans for teaching at Bart's in the light of the Royal Commission on Medical Education—the Todd Report. Among his points were the following:—

The Todd Report envisages a "Teaching Unit" of two Teaching Hospitals with their associates and a multi-faculty college with an "Area Responsibility" for a section of London. In our case Bart's and the London Hospital join forces to cover the Hackney and Tower Hamlets districts, with a population of about two million people. First and Second M.B. exams would be abandoned and replaced by a three year degree course done at a completely new Faculty of Medicine at Queen Mary's College. The Report also stresses the chronic shortage of new doctors and has calculated that to maintain the N.H.S. 3,500 must be trained by the Medical schools each year after 1975. Unfortunately, assuming that ALL the current plans for increasing the output are completed on time we shall only meet this figure in 1980 at the earliest and most probably much later. As a result, a joint committee from Bart's and the London have put forward a proposal to increase their joint output from 200 to 300 at the new Faculty at Q.M.C.

So far so good, but the support and money for this scheme comes from the University Grants Committee, and so far they have not agreed to the plan nor to supply the extra money required. Despite these discouragements the two Hospital bodies are proceeding with joint projects including Child Health and Genetic Research (inadequate at both hospitals) and other plans include facilities for Transplant Surgery, provision for a Burns Unit, and a Clinical Studies school.

At present these are only in the planning stage, and with little money on the way massive rebuilding prospects are remote, to say the least. Optimistically the first phase may start in the next five years, but there will still be Teaching at Charterhouse in 20 years time.

The *Journal* thinks that in spite of all the coming changes, Bart's must not lose its identity and become just another Hospital. The U.G.C. is committed to implementing the Todd Report, and we can derive great benefit as a result, but it is up to everyone at Bart's and particularly those who represent us, to make sure that the only changes made are those which will keep the Hospital to the forefront of Patient care, Medical Teaching and Research.

Letters to the Editor

More Food for Thought

The Editor of *Bart's Journal*

Dear Editor,

You were good enough to publish a letter from me in June 1967 on "Food for Thought". It was about the "Malabsorption Syndrome", leading to psychiatric behaviour and hence rioting and world wars.

Your June 1970 issue has a very good article by Mr. Denis Burkitt, blaming bad diets for many somatic illness in civilised countries. The bad neurotic and mental effects of this, e.g. pellagra and schizophrenia, have lately been emphasised by reports in books and medical journals, the Burning Feet Syndrome from malabsorption of folic acid and riboflavin and nicotinic acid, from the jejunum poisoned by the L leucine of maize, or the gluten of wheat, rye, barley and oats, in descending order of toxicity I note that the obituary notices in the *B.M.J.* show that only about 5% of Doctors reach the age of 80, and that that small percentage have been born, bred and educated in Scotland or have parents of Scots descent. They are most likely like myself (now nearly 82) to have been addicted to porridge and kibbled oats (now called "steelcut") as a main ingredient of their diet. For years I have ordered gluten free diet to my arthritic and psychiatric patients, and given yeast and calcium (and often advised them to read the semiquack books and magazines, like "Heres Health and Prevention", or Gayelord Hausers' "The New Diet Does It"). My grandmother (Mrs. Roberts) cured Florence Nightingale in the Crimea during an attack of Enteric Fever, by the use of the same diet in the 9th edition of William Buchan's book "Treatise of Domestic Medicine" (1st edition about 1770, and used by Captain Cook exploring Australia). The chapter on the "Bloody Flux", I wore out long ago, reading to patients. Arrowroot and Sago and fruit juice was his remedy. Dr. W. M. Byam's two books—"Harley Street" and the "Road to Harley Street" confirms his dislike of milk in Enteric Fever.

I hope your Physicians will try gluten free diets in controlled series, like Drs. Abram and Hoffer in curing and relieving Schizophrenic in Saskatchewan, or Dr. F. C. Dohan in Pennsylvania—I have cured many families with Battered Babies (or Wives) and early Rheumatoid Arthritis, Multiple Sclerosis and colitis and anaemia and skin diseases, e.g. Lichen planus (common) and Dermatitis herpetiformis (rare).

Yours sincerely,

R. A. R. WALLACE.

References: Temper Tantrums Petit Mal etc.
(*B.M.J.* June 20th, p. 120, 1963. *B.M.J.*
Sept. 24th, 1960).

Emigration of Doctors

95 Harley Street,
London. W.1.

Dear Editor,

You do well to draw fresh attention to the question of emigration of British doctors but your contributor, Andrew Orr, is in error in dating Abel-Smith and Gales' paper prior to that of John Seale.

At a time when the Ministry of Health, the Royal Colleges and the British Medical Association were all unaware of the magnitude of the migration problem, a then senior registrar in medicine, John Seale, was able to ascertain the facts. And how did he do this? By the very simple device of addressing an air-mail letter to the appropriate Government department of various Commonwealth countries and the U.S.A.

After making due allowance for possible double registration in different States or Provinces, Seale was able to publish (*British Medical Journal*, 12th December, 1964) a remarkably accurate estimate of the numbers of British medical graduates who had emigrated in the previous decade. John Seale received no thanks for his efforts: indeed, Enoch Powell, who was then Minister of Health, went out of his way to tell a meeting of doctors "this is a slander on your service". A subsequent Socialist Minister of Health then initiated an official investigation to prove Seale wrong. Contrary to the Minister's expectations, the study by Abel-Smith and Gales which was published two years after Seale's paper showed how accurate John Seale's calculations had been.

Though much of this illuminating if melancholy tale has been forgotten, I think it important that your readers should be reminded that it was the enterprise of one determined man which drew attention to the astonishing and serious "brain drain" of British doctors. The reaction of the Minister and the Ministry of Health to these inconvenient revelations was as shabby as it was irrational, and Seale had to weather a storm of unjustified and unpleasant criticism. However, Seale's pioneer efforts were fully vindicated and it is pleasant to be able to record that he is now on the consultant staff of both St. Thomas's and the Middlesex Hospital.

Yours faithfully,

REGINALD S. MURLEY.

Medical Illustration

Medical College Library,
St. Bartholomew's Hospital,
West Smithfield, E.C.1.

Dear Editor,

The interesting article by Messrs. Cull and Tredinnick on Medical Illustration in your June issue might give the impression that the Hospital never previously had the services of a photographer or artist until 1948 and 1960 respectively, which would be quite untrue. Without presenting documented facts, it can be stated that the offices of Librarian and Artist were combined before the middle of last century, and that W. A. Delamotte and Thomas Godart served in that dual capacity. Godart succeeded Delamotte in 1852 and in 1881 he asked for the offices to be separated, he continuing as artist. Leonard Portal Mark (1855-1930) also made drawings for the Hospital, and a few years ago many of these were still in the Museum.

Miss Margaret Vaughan did photographic work in the Surgical Unit before the war, and there was also a photographer in the Department of Pathology. There have probably been others, but although these individuals performed a useful function and met the then current demand, it is obvious that the foundation of a special department has contributed greatly to the development and appreciation of the value of medical illustration in both teaching and research.

Yours faithfully,

JOHN L. THORNTON,
Librarian.

House Jobs

6 Cholmeley Crescent,
Highgate,
London, N.6.

Dear Editor,

I was impressed by the number of students that signed the letter relating to house jobs in the April edition of the *Journal*.

They stated that there should be an increase in the number of Bart's circuit jobs. Partly as a result of my persuasion, the consultant for whom I work at present arranged to have his house job appointed by Bart's. The appointment was duly made but when the appointed person was approached with a view to doing a locum tenens during the fortnight preceding his official starting date he stated that he did not wish to accept the appointment at all.

I would like to point out that the students' second point "that those refused have adequate time to make alternative arrangements" should be honoured by both sides in these appointments.

Behaviour such as this is unlikely to increase the number of Bart's circuit jobs.

Yours faithfully,

ALEXANDER P. ROSS.

Buildings

The Charing Cross Group of Hospitals,
Fulham Hospital,
St. Dunstan's Road, Hammersmith, W.6.

Dear Editor,

I am sure that in an age of aesthetic vulgarity and soft options no one who has been reading the *Journal* has been naive enough to be surprised by the news of the future demolition of Gibbs' East and West wings. Mr. Hoare's letter is timely, I, like most, am not fully acquainted with the impending changes and the reasons for them. The persons responsible for the decision must come forward and put all the relevant facts before us so that they be openly debated.

One cannot help remembering a recent television play by John Betjeman in which Westminster Abbey was demolished in favour of a new traffic system for Parliament Square.

Yours faithfully,

ROGER CLAYTON.

Announcements

Births

CARRINGTON—On March 12, to Dr. Elizabeth (née Ware) and David Carrington, a son (Charles David).
CHEETHAM—On June 10, to Penelope (née Charlton) and Dr. Paul Cheetham, a daughter (Victoria Jane).
PAGAN—On June 11, to Fiona (née Roulston) and Dr. William Pagan, a son (Jonathan William).

Engagement

BAGSHAW—MALLIN-JONES—The engagement is announced between Dr. Hilary Bagshaw and Miss Hilary Mallin-Jones.

Deaths

CAPPS—On June 12, Frederick Cecil Wray Capps, F.R.C.S., aged 72. Qualified 1921.
EVANS—On May 20, Edward Gerald Evans, M.R.C.S., L.R.C.P., aged 54. Qualified 1939.
PEARSON—On April 23, L. V. Pearson, M.A., F.R.C.S.E.D., aged 69. Qualified 1925.
PRINGLE—Ernest George Pringle, M.D. Qualified 1902.
ZSHERPEL—H. D. R. Zsherpel, M.B.E., M.R.C.S., L.R.C.P., aged 71. Qualified 1928.

Birthday Honours

Knights Bachelor

Francis Avery Jones, C.B.E., M.D., F.R.C.P.

C.B.E. (Civil)

John Henderson Hunt, M.A., D.M., F.R.C.S.

M.B.E. (Australian list)

Constance Fairhall.

Fellow of The Royal College of Obstetricians and Gynaecologists

Alexander Michael Dawson.

Prizes

The Mental Health Research Fund Prize Essay and Travelling Fellowship (£1,500) awarded to Mr. Brian Owen.

Recent Papers by Bart's Men

- ANDERSON, Barbara R. and others. The measurement of serum pyridoxal by a microbiological assay using *Lactobacillus casei*. *J. clin. Pathol.*, 23, 1970, pp. 232-242.
- CATTELL, W. R., and others. Effect of diuresis and frequent micturition on the bacterial content of infected urine: a measure of competence of intrinsic hydrokinetic clearance mechanisms. *Brit. J. Urol.*, 42, 1970, pp. 290-295.
, see also SHAND, D. G., and others.
- COLTART, T. M. (and Crossley, J. N.). Influence of dietary sucrose on glucose and fructose tolerance and triglyceride synthesis in the baboon. *Clin. Sci.*, 38, 1970, pp. 427-437.
- *COTES, I. F. (with Field, G. R.). Lability of pulmonary pressure/flow curves during exercise in clinically mild bronchitis; evidence for a pulmonary vascular sluice in man. *Clin. Sci.*, 38, 1970, pp. 461-477.
- DAVIES, D. Garfield. The temporal bone in Paget's disease. *J. Laryngol. Otol.*, 84, 1970, pp. 553-560.
- DAWSON, A. M., see DYER, N., and others.
—, see also ZEEGEN, R., and others.
- *DISCOMBE, G. (and Lund, S.). Urea inhibition of lactate dehydrogenase. *Acta med. Acad. Scient. Hung.*, 27, 1970, pp. 111-117.
- DRINKWATER, J. E., see ZEEGEN, R., and others.
- DYER, N. H., and others. The incidence and reliability of individual radiographic signs in the small intestine in Crohn's disease. *Brit. J. Radiol.*, 43, 1970, pp. 401-408.
- FRY, I. Kelsey, see CATTELL, W. R., and others.
- FULFORD-JONES, Catherine E., see ANDERSON, Barbara B., and others.
- *GLENISTER, I. W. Ovo-implantation *in vitro* and its relation to normal implantation. *Ovo-Implantation: Human Gonadotropins and Prolactin*, 1970, pp. 73-85.
- GUNZ, F. W. (and others). The use of etiocholanolone for the measurement of marrow granulocyte reserves. *Med. J. Aust.*, 1, 1970, pp. 763-767.
—, (with others). The dangers of surgery in uncontrolled haemorrhagic thrombocytopenia. *Med. J. Aust.*, 1, 1970, pp. 704-708.
- *HAYNES, W. D. G. *Taenia crassiceps*: Uptake of basic and aromatic amino acids by larvae. *Exp. Parasitol.*, 27, 1970, pp. 256-264.
- *HENRY-GUTT, Rita. Personality and headache. *Proc. Migraine and Manipulation Symposium*, Nov. 22, 1969, pp. 11-15.
- *KNILL-JONES, R. P. (and others). Prestomal ileitis: clinical and pathological findings in five cases. *Quart. J. Med.*, 39, 1970, pp. 287-297.
- , (with others). Amantadine dosage in treatment of Parkinson's disease. *Lancet*, May 30, 1970, pp. 1130-1133.
- LOFTS, B. (with others). The circadian basis of photo-periodically controlled spermatogenesis in the greenfinch *Chloris chloris*. *J. Zool. Lond.*, 161, 1970, pp. 125-136.
- NIMMON, C. C., see SHAND, D. G., and others.
- O'GRADY, F., see CATTELL, W. G., and others.
—, see also SHAND, D. G., and others.
- PEART, M. Barbara, see ANDERSON, Barbara B., and others.
- POTTER, J. M. The management of head injuries. *Brit. J. Hosp. Med.*, 3, 1970, pp. 909-912.
- RUTHERFORD, C., see DYER, N., and others.
- SALES, J. E. L. Obturator by-pass technique in post-irradiation arterial disease. *Proc. Roy. Soc. Med.*, 63, 1970, pp. 624-625.
- SARDESON, J. M., see CATTELL, W. R., and others.
- SHAND, D. G., and others. Relation between residual urine volume and response to treatment of urinary infection. *Lancet*, June 20, 1970, pp. 1305-1306.
- SMITH, Barbara. Disorders of the myenteric plexus. *Gut*, 11, 1970, pp. 271-274.
- SPIRO, F. I., see CATTELL, W. R., and others.
- SUTCLIFFE, M. B., see CATTELL, W. R., and others.
- VERBOV, J. L. Dermatoglyphs in leukaemia. *J. med. Genetics*, 7, 1970, pp. 125-131.
- VISICK, J. H., see DYER, N., and others.
- WATKINS, Sylvia M. Polycythaemia masked by megaloblastic anaemia. *Proc. Roy. Soc. Med.*, 63, 1970, pp. 32-33.
- ZEEGEN, R., and others. Method for measuring cerebral dysfunction in patients with liver disease. *Brit. med. J.*, June 13, 1970, pp. 633-636.
- *Reprints received and herewith gratefully acknowledged. Please address this material to the Librarian.

ATTITUDES AND EMOTIONAL REACTIONS TO PHYSICAL ILLNESS

by Professor Linford Rees

Every physical illness has psychological and social aspects which interact with each other and with environmental factors in a complex manner.

Psychological aspects may be a reaction or consequence of the physical illness, constituting a somato-psychic sequence of events. Emotions and stresses may have a causative role in certain disorders. This is a psychosomatic sequence usually mediated by autonomic or neurohumoural mechanisms. Both sequences can be concurrent in some illnesses, e.g., cardiac disease, asthma and peptic ulceration, giving rise to vicious circles which result in perpetuation or exacerbation of the disorder. Attitudes and emotional reactions to illness should therefore be considered in the context of the dynamic interaction of multiple factors which may be physical, psychological or social.

Multiple Causation of Disease

In the past, clinicians have tended to seek a single cause for a particular disorder. Modern medicine no longer accepts this view and regards every illness as the resultant of the interaction of many forces in the individual and his environment. Aetiology involves consideration of a variety of factors which may be predisposing or precipitating or immediate or remote. Some factors can be regarded as necessary causes without which the disease could not develop. Other causes may be as important even though they are not essential, because they are the sufficient factors which enable the necessary cause to be manifested clinically in illness. Taking tuberculosis as an example, the essential cause is the tubercle bacillus, but it is well known that the disease tuberculosis does not necessarily develop even when the tubercle bacillus invades the body. Other conditions, including constitutional, nutritional, stress and other environmental factors may be conditions sufficient to enable the essential cause to be manifested as the disease tuberculosis.

The influence of the Patient's Personality

Certain types of personality react characteristically to illness and hospitalisation. It will help doctors and nurses to recognise certain personality types.

(1) *The very dependent and over-demanding person:*

This type of person has always been very dependent on others and relying on them to bolster feelings of acceptance and security. Requests for medical advice or help are presented with urgency and demanding special attention. He readily puts himself in the hands of the doctor with hopeful expectation of unlimited care. If he does not receive the care and attention to which he considers he is entitled, he will be hurt and

resentful, or become depressed and apathetic. Such patients tend to welcome illness as it represents to them a return to a state of secure, happy dependency as in childhood. When it seems necessary to impose limits because of the excessive nature of the patient's demands, it is important to introduce these not as if they were the expression of disapproval or punishment, but as an important step in regaining independence.

(2) *The Obsessional Person:*

These patients exhibit excellent self-discipline. They are neat, tidy, meticulous and extremely conscientious. They love to have everything set out in orderly fashion and tend to get upset if their regimes and plans are interfered with in any way. They are very punctual and reliable. They feel that everything must be under control and to them an illness may represent a threat to self-control. They may redouble their efforts to be more responsible, orderly and to control emotional reactions, often becoming more inflexible and opinionated. It is important to keep such patients adequately informed about their illness and the necessary steps in diagnosis and treatment. If encouraged, the obsessional patient will do his utmost to co-operate actively in his convalescence and rehabilitation.

(3) *Hysterical Personality:*

Hysterical patients are attention-seeking and have a great facility for manipulating people and situations to their advantage. He or she will tend to react to the doctor in an intense, eager, warm and personal way, expecting him to respond similarly. These patients have an intense craving for approval and affection and want to be noticed and approved as special persons. They often become very jealous when the doctor shows interest in other patients. They exaggerate and are characteristically unreliable. Their emotional reactions, although apparently vivid, are in fact shallow. These patients respond best to a combination of sympathetic interest and general firmness, i.e., a combination of the whip and the carrot achieving the best results.

(4) *The suspicious, guarded, querulous (paranoid) person:*

These patients are suspicious and watchful of others. They are quarrelsome, tending to blame others for their misfortunes. They tend to harbour grievances and usually have a deep sense of hurt or having been let down by other people. Characteristically their illness is blamed on others. During illness they usually become more anxious, suspicious and quarrelsome. With such patients one should be prepared to listen without getting too involved. Arguing with them is useless and often results in loss of the patient's co-operation.

(5) *Introverted, withdrawn (schizoid) persons:*

These patients are remote, uncommunicative and lack involvement with every day events and the concerns of other people. They are quiet, seclusive, unsociable and show minimal emotional reactions.

(6) *Cyclothymic persons:*

In contrast, this type of patient is sociable, extraverted, seeking company when worried. They show marked mood swings, varying from depression to elation with their behaviour and outlook closely reflecting their prevailing mood.

(7) *The over-anxious person:*

This type of patient meets dangers half way and tends to be unduly anxious about all aspects of his life. An illness to him is a great threat which greatly intensifies his anxiety reaction.

(8) *Hypochondriacal persons:*

These patients have always been preoccupied with health and tend to make excessive requests for medical advice for minor complaints.

In all persons, whether normal or abnormal in personality, certain mental mechanisms tend to occur during illness.

Some Psychological Mechanisms associated with Physical Illness Regression: Some patients in the face of the stress and inherent threat of physical illness return to less mature forms of behaviour. This is termed regression. Regression may show itself in extreme dependence and excessive demands for care, attention and affection, with aggressive outbursts if not satisfied. In some patients regression shows itself in the form of withdrawn, uncommunicative behaviour.

Denial: Denial is the process of excluding unwanted or painful matters from one's consciousness. This can occur when the early symptoms of illness occur or may be a phase in any part of the illness. It can even occur in patients with inoperable carcinoma with secondary deposits, when they deny that anything at all is wrong with them.

Depression and Withdrawal: In this reaction the patient, as it were, succumbs to the illness, becomes self-absorbed, withdrawn and depressed. It is important to remember that depression, if severe, produces its own effects such as difficulty in concentration, marked fatigue, loss of appetite, and weight, constipation and sleep disturbances which can complicate the clinical picture in any physical illness.

Anxiety Reactions: Anxiety is the most common reaction to illness. It will be particularly marked in people with previously over-anxious personality. The bodily concomitants of anxiety, mediated through the autonomic nervous system and the musculoskeletal system, may produce symptoms super-added to those due to the physical illness, e.g., anxiety causing increased muscle tension can produce pains in affected muscles and regions of the body.

Anger and Hostility: This reaction can occur when confronted with the diagnosis, or subsequently. The patient may be angry with fate or frustrated by the suffering and the limitations imposed by the illness and the threat it carries to him and his family.

Hysterical Conversion Symptoms: Hysterical symptoms may be added to any physical illness. These is usually some motive of gain to the patient, whether this is real or imaginary. There may be a hysterical prolongation of the symptoms of any illness, or the occurrence of hysterical superadditions to physical illnesses such as hysterical weakness, paralysis, loss of sensation, regional pains, or any other symptoms. Hysterical symptoms must not be confused with malingering. An hysterical symptom is real, whereas malingering is a condition in which the patient pretends he has a symptom which he knows he has not.

A variety of psychological reactions sometimes occurs in a particular illness: Denial with overcompensation in the form of unconcern or even elation. Later this may be followed by realisation with feelings of resentment and hostility, and subsequently by anxiety or depression before a satisfactory adjustment to the illness is achieved.

It will be convenient to consider the patient's reactions and attitudes with regard to the following phases and facets of illness:

- (1) The initial symptoms
- (2) Medical consultation and interview
- (3) Physical examination, laboratory and other investigations
- (4) The diagnosis and the course of illness
- (5) Admission to hospital
- (6) Discharge from hospital
- (7) Convalescence and rehabilitation
- (8) Facing incurable illness, death and dying

Initial symptoms

Symptoms are private subjective experiences which may or may not be communicated to others as a complaint. Whether a symptom is communicated or not may be determined by a variety of factors including the patient's psychological reactions. The patient may be too frightened to communicate his symptoms either to his relatives or to his doctor. He may adopt an "ostrich" policy in the hope that ignoring a symptom will make it disappear. Some anxious and hypochondriacal patients seek medical advice unduly frequently and take up a great deal of the doctor's time. Even these patients need discussion and reassurance. Other patients will postpone reporting to the doctor, either because of fear, or because of psychological denial of the symptoms.

Consultation and Interview

It is reasonably safe to assume that most patients are anxious when they have to consult their doctor about illness. An illness is always a threat and patients are frightened about its nature and seriousness and whether it will endanger his security and that of his family; also how much suffering he will have to endure and whether it will affect his future earning capacity. Patients will search the physician's face for any expression which may convey his verdict on the illness and will attach importance to every word he says.

The interview is the main medium for establishing good doctor/patient relationships. The doctor must be sympathetic and accepting and not only must be interested in the patient but must make this evident to

him. He should put the patient at his ease and never give the impression that he is in a hurry. If the doctor keeps looking at his watch the patient will feel that his illness doesn't warrant the doctor's valuable time and will tend to feel rejected. The doctor should let the patient talk as much as possible and avoid questions which can be answered by "yes" and "no". He should follow up any clues provided by the patient. He should be willing to listen and discuss the patient's anxieties and problems.

Physical Examination and other Investigations

A thorough physical examination will impress the patient that his doctor is competent, conscientious and reliable, thus increasing his confidence and trust. The doctor should discuss the investigations proposed and keep him informed about the results. Adequate communication between doctor, patient and nursing staff will prevent unnecessary anxiety in the patient. It is important to remember that unnecessarily repeated investigations which the doctor orders because he may be afraid to miss an organic condition can lead to iatrogenic disability involving hypochondriasis, anxiety or depression.

Admission to Hospital

We sometimes fail to appreciate what it means to a patient to leave his home and to enter hospital when he is already severely anxious about his illness and what is going to happen when he is in hospital. For some patients it may be the first separation from home and the first experience of seeing people suffering from grave illnesses or being with dying patients. The best way of dealing with these anxieties is to listen and talk to the patients and their relatives on admission and during their stay in hospital. Appropriate communication of information can relieve endless anxiety.

Discharge from Hospital

It is not unusual for patients to experience apprehension when due to be discharged from hospital. Anxiety reactions are more likely if the patient has been in hospital for a long time, if his illness was serious or if there is a possibility of recurrence after he leaves. He may find it difficult to give up his dependent role of being cared for and protected. He may be anxious about discharge because of unfavourable social conditions, family problems or difficulties at work. These patients often get an exacerbation of symptoms prior to discharge or may even develop hysterical reactions. It is important to allow these patients to discuss their feelings and attitudes so that they may be helped through their difficulties before discharge.

Psychological Invalidism and Rehabilitation

Many patients, although recovering completely from their disease or injury, may still be incapable of working because of their state of psychological invalidism. This occurs in patients who are motivated to prolong their convalescence as much as possible because of the advantages obtained during their illness in terms of sympathy, care and attention. Others who have been in hospital for long periods lack the interest and motivation and the confidence to resume work. Modern rehabilitation involves the use of physical rehabilitative methods and procedures starting as soon as possible

after admission and the planning of convalescence with a view to speeding up the recovery of physical and psychological functions.

Incurable Illness, Death and Dying

One of the most difficult decisions facing the doctor is what to tell a patient who is suffering from an incurable illness which may be in its terminal stages.

There is no simple answer. The decision what to say will depend on the personality of each patient, his anxieties, hopes, expectations and religious beliefs. Furthermore, the attitudes and wishes of close relatives will have to be taken into account.

Fixed rules cannot be laid down. Each patient has to be considered separately. The important thing is that the patient has the opportunity to discuss with his doctor his fears and problems and he should be allowed to discuss any aspect of his illness. The doctor in entering into this relationship will not know in advance what the appropriate answer is going to be but will decide in the light of what emerges from the interviews.

Not infrequently the patient does not necessarily expect or want a definite answer but needs the opportunity of discussing his anxieties and problems. Some doctors have difficulty in talking to dying patients and will avoid them or make minimal contact.

In conclusion we may say that interviews with dying patients must be governed by the patient's needs and not dictated by the doctor's preconceived ideas or emotional reactions.

The author described in this journal examples of inter-relationships of physical, emotional and social factors in various medical and surgical illnesses (Rees, 1968). It is therefore proposed to take one disorder to illustrate some of the relationships considered in this article.

Duodenal Ulcer. Psychosomatic and Somatopsychic Interactions

The outstanding researches of Wolf and collaborators (1943) clearly demonstrated the influences of different emotions on gastric functioning, including production of gastric juice, vascularity and muscular actions.

These studies revealed that certain emotions produced demonstrable and measurable changes in gastric functioning which were conducive to the development of peptic ulceration. The brilliant researches of Mirsky and co-workers (1958) have thrown further light on the predisposing and precipitating factors in duodenal ulcer.

It was shown that three main factors are involved:

- (1) Physical level of gastric secretion as measured by pepsinogen levels and excretion.
- (2) Psychological factors including personality and emotional conflicts.
- (3) Social environment factors, particularly stresses which evoked psychological conflicts and emotional reactions.

A prospective study was carried out on a large series of inductees into the American Army and pepsinogen secretion in the urine and pepsinogen level in the blood was measured. Patients with high serum pepsinogen levels (hypersecretors) were compared with those with low levels of serum pepsinogen (hyposecretors) and were followed up during their Army training. Psycho-

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logical tests were carried out independently on these two groups and it was found that the two groups could be clearly distinguished by the tests in items relating to personality, particularly unresolved conflicts about dependence. Follow up studies showed that none of the hypersecretors developed duodenal ulcer. All the soldiers who developed duodenal ulcer were from the hypersecretor group and these had personality characteristics which contributed to the development of emotional tension during periods of stress during Army training.

In other words, the predisposing factors were high pepsinogen levels and certain personality characteristics but the precipitating factor was the experience of stresses during training which evoked sustained emotional reactions.

These observations, together with those of Wolf, clearly demonstrate the operation of psychosomatic sequences in the development of duodenal ulceration.

Somatopsychic effects can also be important. The pain, distress and disability associated with a duodenal ulcer can result in feelings of anxiety, frustration, resentment, anger and hostility, depending on the patient's personality and attitudes. These reactions in turn increase acidity via the vagus and intensify ulcer symptoms, thus creating a vicious circle.

The patient's reaction to his illness, particularly if it involves denial, rebellious and independent reactions or "bloody mindedness", can affect his co-operation in carrying out prescribed treatment, whether by diet, drugs or other means and can militate against recovery.

Furthermore, response to surgery for duodenal ulcer is affected by the patient's personality and adjustment.

It has been found that the more the duodenal ulcer has been incorporated with his life pattern and personality reactions the greater is the tendency for new symptoms and invalidism to develop post-operatively. Conversely, in persons who had adjusted well to their duodenal ulcer the better the post-operative results and indeed in many of these patients a great improvement in their emotional reactions and attitude results from relief of the ulcer symptoms through surgery.

These observations on duodenal ulcer clearly indicate the need to consider not only its physical aspects but psychological and social factors which may also determine the success or failure of treatment.

References

- BALINT, M. (1968) *The Doctor, His Patient and the Illness*. Pitman, London.
- ENGEL, G. L. (1964) *Psychological Development in Health and Disease*. Saunders, Philadelphia and London.
- HINTON, J. (1967) *Dying*. Penguin Books, London.
- HOUSON, M. (1967) *Doctors and Patients*. Hodder and Stoughton, London.
- MIRSKY, I. A. (1958) Physiologic, psychologic and social determinants in the aetiology of duodenal ulcer. *Amer. J. Dig. Dis.* 3: 285.
- REES, LINFORD (1967) *A short textbook of Psychiatry*. English Universities Press, London.
- REES, LINFORD (1968) *Psychiatry and Medicine*. St. Bart. I. 72: 440.
- WOLF, S., and WOLF, H. G. (1943) *Human Gastric Function*. Oxford, New York.

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XANTHINURIA

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Xanthine oxidase (xanthine: oxygen oxidoreductase, E.C.1.2.3.2.) is a flavoprotein, molecular weight 275,000. It contains two molecules of flavin-adenine dinucleotide (FAD), two atoms of molybdenum and eight atoms of iron per molecule of the protein, the detailed amino acid composition of which was reported by Bray & Malmström (1964). These co-factors provide a path for the flow of electrons which occurs when the enzyme operates; oxygen is the terminal electron acceptor and hydrogen peroxide is generated. Xanthine oxidase has a wide substrate specificity comprising: certain purines, pteridins and aldehydes. It has been suggested that the enzyme has two, presumably equivalent, active centres: but McGartoll and Bray (1969) have presented evidence for the view that the enzyme functions with a single active centre at least during the aerobic oxidation of xanthine, and it is the activity of the enzyme towards hypoxanthine and xanthine (Figure 1) which is particularly germane to this communication. Milk, liver tissue and small intestine mucosa contain the highest concentration of the enzyme although low levels of enzyme activity can be detected in some other tissues in certain species (Al-Khalidi and Chaglassian, 1965). There have been a few reports which suggest that xanthine oxidases from different sources may not be chemically identical (Roussos, 1963; Sackler, 1966). The measurement of serum xanthine oxidase levels as a sensitive test of acute liver injury has been suggested by Sharma, Nasrallah, Chaglassian, Kachadurian and Al-Khalidi (1965). Xanthinuria (congenital xanthine oxidase deficiency) is a very rare metabolic disorder which is, however, of more general interest because the xanthine oxidase inhibitor allopurinol is used to reduce the rate of uric acid production in gout and in some other conditions. This produces a metabolic situation which resembles, in incomplete form, that which is encountered in xanthinuria.

Xanthine urinary stones have occasionally been reported in the medical literature for many years; Marcet (1817) having introduced the term "xanthic calculus" because, as he wrote, "this term alludes to a striking and probably characteristic property of the substance in question (that of forming a lemon-coloured compound when acted on by nitric acid) and yet does not imply any systematic notion as to its composition". Dent and Philpot (1954) first used the term "xanthinuria" to describe a patient with a xanthine stone, increased urinary excretion of xanthine and virtually complete absence of uric acid from the blood and urine. They suggested that the condition might be an inborn error of metabolism which involved lack of xanthine oxidase.

Reported cases of xanthinuria

Case 1 was the 4½-year-old girl reported by Dent and Philpot in 1954. She had presented with a radiotranslucent urinary stone. This proved to be a xanthine stone, the urinary excretion of xanthine was increased,

and hypouricaemia and hypouric aciduria were demonstrated. Further studies by Dickinson and Smellie (1959) on the same patient when she was nine years old established that abnormal amounts of both hypoxanthine and of xanthine were present in the blood and in the urine and that the renal clearance of the oxypurines (hypoxanthine and xanthine measured together) was increased. These workers suggested that in addition to its known catalytic activity in the oxidation of hypoxanthine to xanthine and of xanthine to uric acid, xanthine oxidase also functioned as a "permease" which promoted the reabsorption of hypoxanthine and xanthine by the renal tubular epithelium. Seegmiller and his colleagues were able to establish subsequently that the high renal clearance of oxypurines, which is observed in xanthinuria, can be explained by the high blood levels of the oxypurines reaching the kidneys and it is not necessary to ascribe a permease function to xanthine oxidase. This is also in accord with the very low level of xanthine oxidase activity which has been found in human renal tissue (Seegmiller, 1965). This original patient is now about nineteen years old and remains well. She is completely asymptomatic although there is residual deformity of the pelvic/lyceal system of the left kidney, and she has formed no more urinary stones (personal communication to R.W.E.W. from Professor C. E. Dent, F.R.S.). **Case 2** the first in whom the enzyme defect was directly demonstrated (Watts, Engelman, Klinenberg, Seegmiller and Sjoerdsma, 1963, 1964), was reported in detail by Engelman, Watts, Klinenberg, Sjoerdsma and Seegmiller, in 1964. This twenty-three-year-old woman had a phaeochromocytoma with congestive heart failure, and hypouricaemia was found during the period of pre-operative medical treatment and assessment. This observation prompted further studies which demonstrated the hypouric aciduria and the changes in the serum and urinary oxypurine concentrations which are characteristic of xanthinuria. The enzyme defect was shown in both liver tissue and in jejunal mucosa by means of both radiochemical and fluorimetric methods of analysis. No other abnormalities were discovered which could be associated with the patient's xanthinuria. However, six years later hypoxanthine and xanthine crystals were found in a skeletal muscle biopsy from this patient (Chalmers, Watts, Pallis, Bitensky and Chayen, 1969; Chalmers, Watts, Bitensky and Chayen, 1969) (*vide infra*).

Case 3 Ayzavian (1964) reported xanthinuria in a haemochromatotic patient aged 54 years. The patient showed the characteristic hypouricaemia and hypouric aciduria with an associated rise in the oxypurine level but with no urinary stones. A low level of liver xanthine oxidase activity was indicated by a histochemical method and the author suggested that the xanthine oxidase deficiency had produced haemochromatosis. However, Seegmiller, Engelman, Klinenberg, Watts and

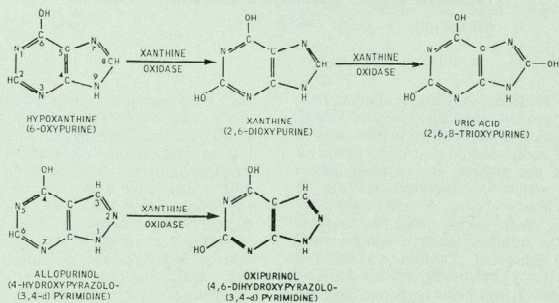


Fig. 1. The xanthine oxidase catalysed oxidation of hypoxanthine and xanthine. (The structures are shown in the enol (lactim) form, although the relative proportions of the oxo (lactam) and enol forms depend upon the conditions under which the compounds are studied).

Sjoerdsma, 1965, found that their patient (Case 2) had normal iron metabolism.

Case 4 a boy of twenty-one months, who presented with urolithiasis and who subsequently spontaneously passed a stone, was reported by Frézal *et al* in 1967. X-ray diffraction and spectrophotometric analysis of the stone showed that it was almost entirely composed of xanthine and further investigation of the patient revealed the characteristic hypouric aciduria and hypouricaemia, associated with elevated levels of the plasma and urinary oxypurines. The enzyme defect was demonstrated by a fluorimetric assay using liver biopsy material.

Cases 5 and 6 Case 5 was a seventeen-year-old youth, who presented with recurrent urinary calculi which were shown on analysis to be composed of xanthine. Prior to this investigation he had passed about 30 calculi, none of which had been analysed. Examination of the patient's urine and plasma showed very low levels of uric acid and increased levels of the oxypurines. Subsequent examination of specimens from the patient's family revealed a 22-year-old brother (Case 6) who excreted more oxypurines than the propositus but who was clinically normal. This family study also revealed a twenty-four-year-old sister who had serum and urinary uric acid levels in the low normal range. Further investigations showed that she had elevated levels of oxypurines, but to a smaller degree than in her two brothers (Delatte and Castro-Mendoza, 1967).

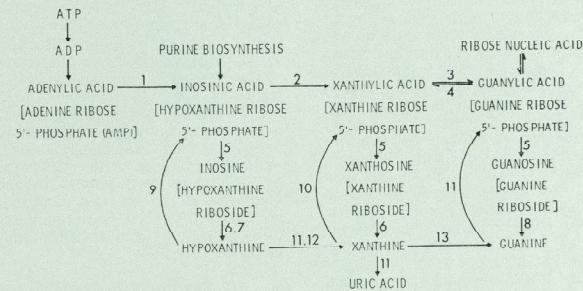
Case 7 was a sixty-two-year-old woman (Bradford and Hrehorovitch, 1969) who presented with psoriasis and arthritis. Xanthinuria was diagnosed as a result of later investigations following the incidental discovery of

Fig. 2. The structural isomers of hypoxanthine and xanthine, allopurinol and oxipurinol respectively. (Shown in the enol form).

hypouricaemia during the initial clinical investigations. Elevated levels of xanthine and hypoxanthine in the urine and plasma were found and the xanthine oxidase deficiency was demonstrated histochemically in a duodenal biopsy. Although a synovial biopsy was taken during the study of her arthritis, it was not examined by polarised light microscopy and no relationship between the xanthinuria and arthritis was demonstrated. **Case 8** (Chalmers, Johnson, Pallis and Watts, 1969) who was an athletic male aged 31 years, presented with subjective sensory symptoms which he described as "tight sensations and a feeling of distension at the back of the thighs and calves." It was concluded that he had a myopathy on the basis of the electromyographic, histological and biochemical evidence. Hypouricaemia was demonstrated during the period of neurological investigation; subsequent investigations showed low levels of uric acid in the urine as well as in the plasma and the characteristically elevated levels of both hypoxanthine and xanthine. The enzyme defect was demonstrated histochemically in a jejunal biopsy.

Other cases of xanthine urolithiasis

Xanthine stones are smooth, brownish, soft and translucent to X-rays. They are found in patients of all ages, either pure or mixed with uric acid or calcium oxalate and the presence of xanthine may be shown by X-ray diffraction or by chemical analysis using chromatographic or spectrophotometric methods. This subject has been reviewed recently by Seegmiller (1968). Xanthine is less soluble than uric acid or hypoxanthine but xanthine stone formation is not invariable in xanthinuria as shown by the above case reports, the urinary xanthine excretion being only one determinant of stone forma-



1. AMP aminohydrolase (AMP deaminase, EC 3.4.5.6.)
2. I.M.P. - N.A.D. oxidoreductase (I.M.P. dehydrogenase, EC 1.2.1.14.)
3. Xanthosine 5'-phosphate; L-glutamine amido-ligase (A.M.P.) (G.M.P. synthetase EC 6.3.5.2.)
4. Guanylic deaminase
5. 5'-ribonucleotide phosphorhydrolase (5' nucleotidase, EC 3.1.3.5.)
6. Purine nucleoside: orthophosphate ribosyltransferase (purine nucleoside phosphorylase, EC 2.4.2.1.)
7. Inosinic ribosylhydrolase (inosinase, EC 3.2.2.2.)
8. Guanine: orthophosphate ribosyltransferase (Guanosine phosphorylase, EC 2.4.2.a.)
9. I.M.P. pyrophosphate phosphoribosyltransferase (Hypoxanthine phosphoribosyltransferase, EC 2.4.2.8.)
10. X.M.P. pyrophosphate phosphoribosyltransferase (Xanthine phosphoribosyltransferase)
11. Xanthine: oxygen oxidoreductase (xanthine oxidase, EC 1.2.3.2.)
12. Peroxidative pathway [Howell and Wyngaerden, (1960)]
13. Guanine aminohydrolase (Guanine deaminase, EC 3.5.4.3.)

Fig. 3. Metabolic pathways leading to the oxypurines and uric acid.

tion. Similarly, not all cases of xanthine urolithiasis are due to xanthinuria. Some of the cases which have been investigated showed normal or even high serum uric acid levels. A few of these cases may be similar to the sister of the two patients described by Delatte and Castro-Mendoza (1967), although the possibility does exist that among other, less extensively studied patients, there have been undetected cases of xanthinuria.

It was thought that xanthine stones might complicate the use of allopurinol in the treatment of gout. Allopurinol is an isomer of hypoxanthine (Fig. 2) and is a competitive inhibitor of xanthine oxidase, being also converted by the enzyme to its oxidation product oxipurinol, which is an isomer of xanthine and a non-competitive inhibitor of the enzyme. Allopurinol therapy leads to an increase in the plasma and urinary xanthine and hypoxanthine levels with an associated decrease in

uric acid. Under these circumstances, the purine load is spread between three compounds, namely hypoxanthine, xanthine and uric acid. One of these, hypoxanthine, is extremely soluble; xanthine and uric acid have rather similar solubilities except that the solubility of xanthine shows less increase at higher pH values than does that of uric acid. Xanthine stones have not occurred in gout patients treated with the drug over the past seven years but this complication has been reported in two allopurinol treated cases of the Lesch-Nyhan syndrome (congenital hyperuricaemia, and hyperuricosuria with choreoathetosis and compulsive self mutilation). The biochemical defect in these patients produces very greatly increased rates of purine biosynthesis and therefore leads to levels of uric acid production which exceed those encountered in primary gout.

Other causes of hypouricaemia

The rarity of hypouricaemia is emphasised by the large numbers of serum uric acid determinations which are now performed as part of routine "biochemical screening" and the infrequency with which the strikingly low levels of serum urate characteristic of xanthinuria are encountered. Hypouricosuria may be caused by an abnormally high renal clearance of urate and this was due to an isolated renal tubular dysfunction in the case reported by Praetorius and Kirk (1950). It may also be associated with other renal tubular reabsorption defects, as in Wilson's disease, the Fanconi syndrome, Hartnup disease, cadmium poisoning and in the two cases of bronchogenic carcinoma reported by Weinstein, Ireverre and Watkin (1965). Mikkleson, Dodge and Valkenberg (1965) found no serum uric acid values of less than 1.0 mg/100 ml in the 6,000 unselected individuals aged four years and over, who they investigated in Tecumseh Michigan, and Kellgren (1964) reported similar results from British, Danish and U.S.A. sources. The frequency distribution of serum uric acid values in the population is approximately normal. The lower limit of the normal range (defined as the mean value minus twice the standard deviation) is about 2.0 mg/100 ml. Thus, subjects resembling the sib of Cases 4 and 5, who may be regarded as being heterozygous for xanthinuria, could contribute to the lower end of the frequency distribution of serum uric acid in the population and remain undetected. Conversely, it is unlikely that there is a large residue of undetected xanthinuria homozygotes, in whom the serum uric acid concentration is typically about 0.5 mg/100 ml.

The inheritance of xanthinuria

Delatte and Castro-Mendoza (1967) reported two cases of xanthinuria in a sibship; and the published case reports have included equal numbers of male and female patients. No biochemical abnormalities have been detected in the relatives of xanthinuric patients except for a sib of the two patients reported by Delatte and Castro-Mendoza (1967) whose serum and urinary oxypurine levels were slightly elevated being 0.1-0.3 mg/100 ml and 60-83 mg/24 hr respectively. This subject's serum and urinary uric acid levels were in the low normal range being 2.3 mg/100 ml and 371-421 mg/24 hr respectively. Thirteen relatives of Case 1, presented by Dent and Philpot (1954), showed no abnormal excretion of uric acid or xanthine, and included her father and mother, who were not related to one another, a sister, five aunts, two uncles and three surviving grandparents. None had a history of renal stone. The three children and two aunts of Case 3 showed high urinary concentrations of uric acid and the mother of Case 2 had normal uric acid and oxypurine levels in plasma and urine and a normal xanthine oxidase activity in jejunal mucosa. The latter case has no siblings and the father was not available for study. The parents and sibs of Case 4 were all said to be in good health but were also not available for study. Case 8 had only one brother available for study and his serum uric acid level was normal. No family study based on Case 7 has been made although the patient has eleven surviving children and nineteen grandchildren. There are no data available upon which to base an estimate of the incidence of consanguinity among the parents of patients with xanthinuria.

Thus, the data are compatible with xanthinuria being autosomally inherited and genetically heterogeneous. In one type, the presumed heterozygotes are completely normal by all the available criteria whereas in the other type (i.e. the case of Delatte and Castro-Mendoza, 1967) minor abnormalities can be detected in the presumed heterozygotes. These tentative conclusions are reminiscent of the completely recessive and incompletely recessive types of cystinuria which were recognised by Harris, Mittwoch, Robson and Warren (1955).

The presence of a normal xanthine oxidase level in the jejunal mucosa of the mother of Case 2 could have been due to the abnormality having arisen because of a new mutation. An alternative explanation would be that the activity of the remaining normal member of the structural gene pair in the heterozygote is derepressed by variation in the activity of a regulator gene. Similar arguments have been used to explain the presence of normal levels of erythrocyte catalase in the heterozygous members of some acatalassaemic families (Hamilton and Neel, 1963).

The metabolic lesion in xanthinuria

The metabolic pathways which lead to uric acid via xanthine are shown in Figure 3. The activity of xanthine oxidase towards both hypoxanthine and xanthine is lost in xanthinuria, so that the increased excretion of xanthine in the disease implies the existence of an alternative metabolic pathway between hypoxanthine and uric acid. The metabolic sequence hypoxanthine \rightarrow inosinic acid \rightarrow xanthylic acid \rightarrow xanthosine \rightarrow xanthine is known to occur in a number of mammalian tissues, and would appear to be the most likely metabolic pathway concerned, although Howell and Wynngaerden (1960) have described a peroxidative pathway for the conversion of hypoxanthine to xanthine. Free purines are converted to the corresponding ribonucleotides by the phosphoribosyltransferase enzymes before undergoing further metabolism, and the higher activity of hypoxanthine phosphoribosyltransferase (E.C.2.4.2.8) than of xanthine phosphoribosyltransferase and consequent greater reutilisation of hypoxanthine than of xanthine may explain why there is greater excretion of xanthine than of hypoxanthine in xanthinuria.

The xanthinuric patients who have been studied in greatest detail have always been shown to excrete very small but significant amounts of uric acid, even when on a strictly purine-free diet, and to have small amounts of uric acid in their urine and plasma (5-10 mg/24 hr and 0.5 mg/100 ml respectively). Direct evidence for the formation of these traces of uric acid from [6-¹⁴C] xanthine was obtained by Engelman *et al* (1964) and ascribed to peroxidative reactions, to the presence of residual traces of xanthine oxidase, or to the metabolic activities of the gut flora.

The renal clearances of the oxypurines

Goldfinger, Klinenberg and Seegmiller (1965) showed that the high renal clearances of the oxypurines which occur in xanthinuria can be reproduced in normal subjects by infusing hypoxanthine and xanthine. They concluded that these high renal clearances merely reflected the abnormally large filtered load of these substances which are presented to the renal tubular epithelial cells. There is evidence for both renal tubular secretion and renal tubular reabsorption of the oxy-

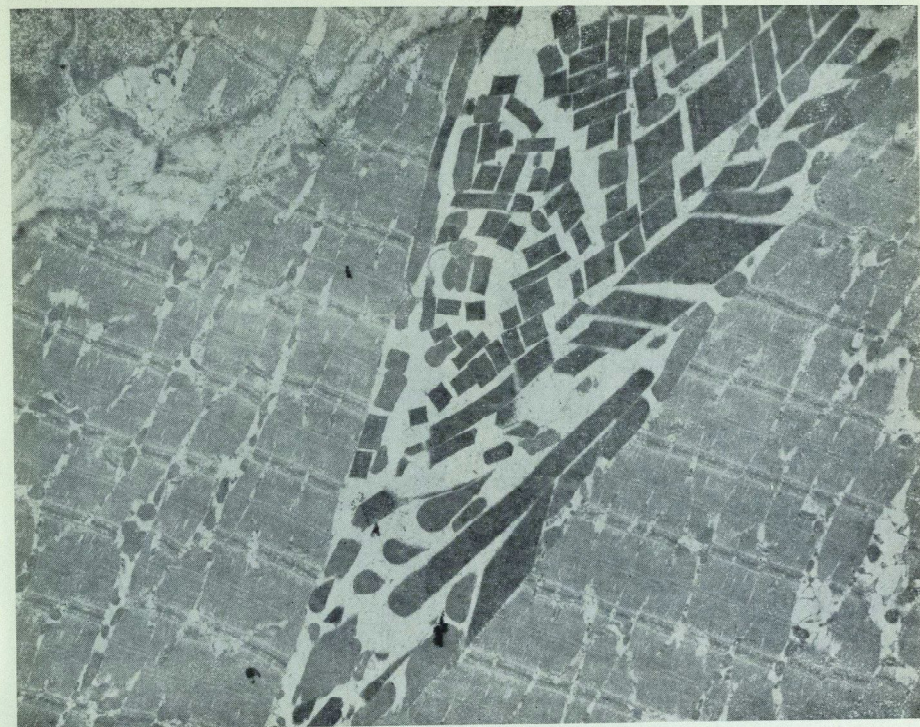


Fig. 4. Electron dense material within a muscle fibre (X 10,500).
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purines. The clearances shown in xanthinuria are decreased by urate infusion (Engelman *et al*, 1964), and increased to give ¹⁵oxypurine/¹⁵ inulin clearance ratios of between 2.2 and 2.5 when para aminohippurate (PAH) is infused (Chalmers, Johnson, Pallis and Watts, 1969). The latter results are of particular importance because they are based on the only studies which have been performed on a xanthinuric patient who had normal renal and cardiovascular function. The methods employed also enabled the authors to show that hypoxanthine and xanthine have closely similar renal clearances in xanthinuria.

Muscle abnormalities

Before the work of Chalmers, Johnson, Pallis and Watts (1969) there had been no suggestion that xanthine or hypoxanthine might be deposited outside the urinary

tract in xanthinuria except possibly for the observation of unidentified crystalline deposits in the ocular lenses of Case 2 and the crystalline particles observed on the surface of the pingueculae of Case 8.

Four muscle biopsies from the gastrocnemii and left triceps of Case 8 showed an increased number of centrally placed nuclei, these were often in chain-like formation and associated with elongated vacuoles and coil-like derangement of the myofibrils. In some other fibres, the levels of phosphorylase, myosin ATPase and oxidative enzymes were lower than normal and the average diameter of all the fibres was unusually high. Electron microscopic examination of the muscle tissue was carried out after the discovery of rod-like inclusions within the fibres. These stained with toluidine blue, and consisted of aggregations of electron dense material which appeared to have a crystalline structure. Some

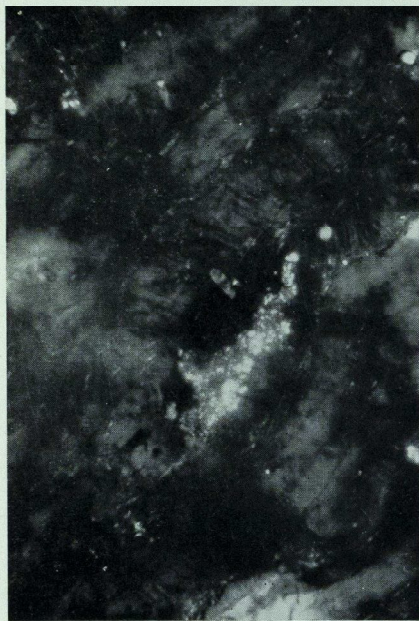


Fig. 5. Photomicrograph of an unstained frozen section of muscle from Patient 8 examined under polarised light (X 1,000). Most of the crystals in this patient's muscle are of the smaller xanthine type. (Originally published in "Nature" (Lond.) (1969), 221, 170).

non-crystalline material was also present and a finely granular sub-structure could be detected in some of the apparently crystalline material. A typical electron photomicrograph is shown in Figure 4.

Electromyography showed many abnormally short polyphasic muscle unit potentials, which were in accord with the presence of a diffuse myopathic process (Chalmers, Johnson, Pallis and Watts, 1969).

A further biopsy from the same patient (Patient 8) was processed immediately after excision and unfixed frozen section were examined by polarised light microscopy. Numerous birefringent crystals (more than 200 per standard size section) were seen, and were identified as hypoxanthine and xanthine by the following criteria; size and shape, extinction angle, sign and degree of birefringence and refractive index. A biopsy from Patient 2 contained a similar number of crystals. Photomicrographs of typical crystals found in these sections are shown in Figures 5 and 6. Only occasional

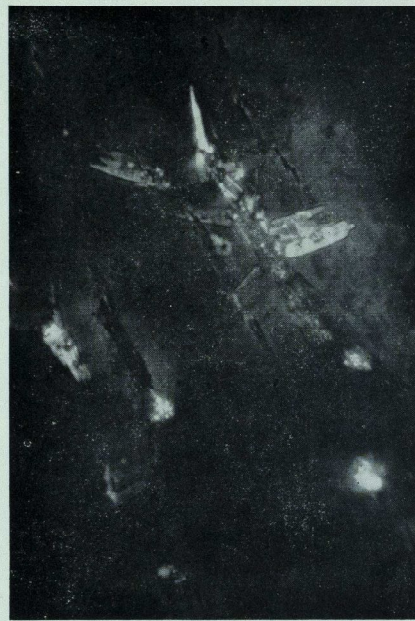


Fig. 6. Photomicrograph of an unstained frozen section of muscle from Patient 2 examined under polarised light (X 1,000). Most of the crystals in this patient's muscle are of the hypoxanthine type. (Originally published in "Nature" (Lond.) (1969), 221, 170).

hypoxanthine crystals (0.3 per standard size section) were found in muscle from any of the 13 control subjects who were undergoing orthopaedic operations and xanthine crystals were never seen in the control tissue. Other studies have shown that the freezing techniques do not themselves cause the crystals to form in muscle when the oxypurines are present in high concentration. It is concluded that the presence of crystals in the muscle from patients with xanthinuria results from the metabolic defect. Thus, inosinic acid is formed from adenylic acid during muscle contraction; there is evidence that some of this escapes reamination and is converted to inosine and hence to hypoxanthine which is further oxidised by xanthine oxidase. The accumulation of xanthine is again best explained by an alternative metabolic pathway for the conversion of hypoxanthine to xanthine as shown in Figure 3. The late onset of muscle symptoms in xanthinuria can be explained on the hypothesis that hypoxanthine formation is only a



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minor metabolic pathway in muscle, and many years must elapse before the deposits become large enough to affect muscle functions. The relationship with the symptoms to exercise would be compatible with their being related to the slow accumulation of hypoxanthine and xanthine which are removed abnormally slowly from their sites of formation because of xanthine oxidase deficiency, this process being further retarded

by the elevated levels of the oxypurines in the surrounding tissue fluid.

The presence of increased amounts of hypoxanthine and xanthine in two xanthinuric patients' muscle tissue was also confirmed by Parker, Snedden and Watts (1969, 1970) using high resolution mass spectrometry and working on dry pulverised tissue which they introduced directly into the mass spectrometer.

References

- AL-KHALIDI, U. A. S., and CHAGLIASSIAN, T. H. (1965). *Biochem J.*, 97, 318.
- AYVAZIAN, J. H. (1964). *New Engl. J. Med.*, 270, 18.
- BRADFORD, M. J., KRAKOFF, I. H., LEEPER, R. and BALIS, M. E. (1968). *J. Clin. Invest.*, 47, 1325.
- BRAY, R. C. and MALMSTRÖM, B. G. (1964). *Biochem J.*, 93, 633.
- CHALMERS, R. A., JOHNSON, M., PALLIS, C. and WATTS, R. W. E. (1969). *Quart. J. Med.*, N.S., 38, 493.
- CHALMERS, R. A., WATTS, R. W. E., BITENSKY, L. and CHAYEN, J. (1969). *J. Path.*, 99, 45.
- CHALMERS, R. A., WATTS, R. W. E., PALLIS, C., BITENSKY, L. and CHAYEN, J. (1969). *Nature, Lond.*, 221, 170.
- DELATTE, L. C. and CASTRO-MENDOZA, H. (1967). *Rev. Clin. Espan.*, 107, 246.
- DENT, C. E. and PHILPOT, C. R. (1954). *Lancet*, i, 182.
- DICKINSON, C. J. and SMELLIE, J. M. (1959). *Brit. Med. J.*, ii, 217.
- ENGELMAN, K., WATTS, R. W. E., KLINENBERG, J. R., SJOERDSMA, A. and SEEGMILLER, J. E. (1964). *Amer. J. Med.*, 37, 839.
- FRÉZAL, J., MALASSET, R., CARTIER, P., FESSARD, C., ROY, C., REY, C. and LAMY, M. (1967). *Arch. Franc. Péd.*, 24, 129.
- GOLDFINGER, S., KLINENBERG, J. R. and SEEGMILLER, J. E. (1965). *J. Clin. Invest.*, 44, 623.
- HAMILTON, H. B. and NEEL, J. V. (1963). *Amer. J. Human Genet.*, 15, 408.
- HARRIS, H., MITTWOCH, U., ROBSON, E. B. and WARREN, F. L. (1955). *Annals Human Genet.*, 20, 57.
- HOWELL, R. R. and WYNGAARDEN, J. B. (1960). *J. Biol. Chem.*, 235, 3544.
- MARRET, A. *An Essay on the Chemical History and Medical Treatment of Calcutous Disorders*. London, 1817.
- MIKKLESON, W. M., DODGE, H. J. and VALKENBERG, H. (1965). *Amer. J. Med.*, 39, 242.
- MCGARTOLL, M. A. and BRAY, R. C. (1969). *Biochem J.*, 114, 443.
- PARKER, R., SNEDDEN, W. and WATTS, R. W. E. (1969). *Biochem J.*, 115, 103.
- PARKER, R., SNEDDEN, W. and WATTS, R. W. E. (1970). *Biochem J.*, 116, 317.
- PRAETORIUS, E. and KIRK, J. E. (1950). *J. Lab. Clin. Med.*, 35, 865.
- ROUSSOS, G. G. (1963). *Biochem. Biophys. Acta.*, 73, 338.
- SACKLER, M. L. (1966). *J. Histochem. Cytochem.*, 14, 326.
- SHARMA, M. H., NASRALLAH, S., CHAGLIASSIAN, T., KACHADURIAN, A. K. and AL-KHALIDI, U. A. S. (1965). *Gastroenterology*, 48, 226.
- SEEGMILLER, J. E. (1968). *Amer. J. Med.*, 45, 780.
- WATTS, R. W. E., ENGELMAN, K., KLINENBERG, J. R., SEEGMILLER, J. E. and SJOERDSMA, A. (1963). *Biochem J.*, 90, 4 P.
- WATTS, R. W. E., ENGELMAN, K., KLINENBERG, J. R., SEEGMILLER, J. E. and SJOERDSMA, A. (1964). *Nature, Lond.*, 201, 395.
- WATTS, R. W. E., WATTS, J. E. M. and SEEGMILLER, J. E. (1965). *J. Lab. Clin. Med.*, 66, 688.

THE SCOPE FOR COMPUTERS IN MEDICINE

by

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Introduction

In medicine, as in other disciplines, the results obtained by using a computer are only as good as the methods represented by the calculation. They reflect also the extent to which the user understands the methods and the technology, and the degree to which the user's requirements are appreciated by his or her professional advisors on the computing side. This means that a carefully-planned programme of mutual education is needed to enable medicine to derive the maximum benefit from computer technology. This process is still in its infancy; its implications reach through the whole educational process, from the medical colleges and science departments of universities down to the secondary and even to the primary schools, in some of which the elements of computing science now form part of the curriculum. However, although increasing familiarity with the type of problems faced by medical workers and administrators will enable the computer scientist to give more informed advice, the main responsibility for the rate at which computers and the techniques they implement advance into medicine rests squarely with the medical profession itself and with the nurses, technicians, scientists and administrators of our hospitals and medical colleges and research institutes.

The computer is quite different from any other instrument or technical concept to appear on the medical scene so far. The reason for this stems from its complete versatility and universality. The same computer which is used to analyse ECG and EEG records can also be used to interpret and control the data flow through a Pathology Laboratory or make assessments of the ways in which diseases or pathogenic organisms should be classified. A computer can be in use at one moment solving complex mathematical models of the circulatory system or of biochemical pathways, and an hour later be concerned in helping to organise the schedule of nursing training or the analysis of drug trials.

To understand the reason for this universality, one must keep in mind that a computer is a *data-handling* machine, but on a far greater scale than other such machines. Its power derives from three sources: *speed*, *data-handling capacity* and *versatility*.

Speed

The speed at which modern computers operate is measured in millionths of a second, and some computers now being developed will be capable of 10 or 50 times such performance. The time taken to add two numbers together in the Honeywell DDP-516 computer now in the Department of Clinical Neurophysiology at Barts (a second such computer should arrive this year in the Computer Unit for Medical Sciences) is less than one

millionth of a second, once they have been entered into the appropriate area of the computer, and this is not exceptional for such machines. To give other examples, the machine can compare one twenty-character name with another for identification purposes in about 25 millionths of a second at most, or sample continuous signals from EEG or ECG machines at rates up to 30,000 times per second if necessary. Allowing for the fact that a considerable amount of organisation is needed to handle data acquired at such a rate, and that this also uses up computer time, there is still room for an incredible amount of data processing to take place in a time adequate to make decisions on the results.

Capacity

Such high data acquisition and processing rates demand a correspondingly high data storage capacity to hold all the information being handled. There are many forms of data storage available for computer use, some with enormous data capacities for their size. On a single one-foot diameter reel of computer magnetic tape, for example, it would be possible to store a file of over 10,000 medical summaries or special-purpose medical records each with about 1100 characters (a character being defined as a digit, letter or other symbol), though the access time for such data could be relatively slow with this storage medium—of the order of minutes for records near the end of the file. Faster access time for bulk storage of data comes with the magnetic disk, a single one of which could hold up to 1200 records of the kind mentioned above, with an access time for any record of about one-tenth of a second.

Versatility

The versatility of the computer arises from the fact that computers are made to carry out their work by means of lists of instructions which are stored in the computer in the same way as the data is stored. Such lists are called programs (purist English: programmes), and the process of storing or changing them in the computer is a very straight-forward affair—something which it must be said is not generally true of the business of constructing the programs in the first place. Thus when a computer has completed the work controlled by the program it currently holds, it is then very easy to re-load the machine with a program for doing something completely different. Hence a computer is able to carry out any job for which the appropriate program exists for that machine, and once a program is available for a particular piece of work, it can be used over and over again at different times, operating on different data.

Preparing a program for any particular calculating or data-handling task is a painstaking business, and the objectives and procedures must be very clearly and precisely defined before one starts on it. The computer is unable to think for itself; it cannot be used to plug holes in the user's reasoning, nor can it extract reliable facts from unreliable data. In the hands of a muddle-headed user, it is no more responsible for its actions and results than a car driven by a drunken driver is responsible for the accident it causes.

Elementary programming is not difficult for the non-specialist to learn, but more advanced work requires professional programmers.

The Link between Computing and Medicine

The need to plan in advance when using computers, and in such detail, and also the precision of thought demanded by this need, often repel non-computer scientists, and medical workers in particular. To them, such preplanning is the essence of inflexibility, whereas medicine so often has to adapt and improvise. Many people in the profession have felt it to be impossible to combine the often irrational and subjective disciplines of medicine with the precise determinism of mathematics and computing.

To some extent, also, it has been a great relief to many physicians and surgeons to feel this way, since it rationalises their fears of quantitative science—particularly mathematics—which are so often current among them. I would suggest that this attitude usually stems from poor quality school-teaching which then affects the attitudes both of medical students and of their teachers who also suffered before them. It is very unfortunate that this should have happened, because there is one overriding factor common to both medicine and computing, and this is *data*.

Medicine is the great example of an observational science; it develops and thrives on data—and the more accurate, precise and reliable the data and the more rapid its handling, the better the use which can be made of it. Indeed modern medicine—and its administration—is becoming more and more quantified and speed-dependent. The research worker is finding an increasing need to put numbers in place of descriptive terms—or perhaps it would be nearer the mark to say “along with” rather than “in place of”. The clinician needs complicated analyses carried out quickly. The hospital administrator wants up-to-date reports; he is becoming impatient with knowing the state of his hospital three months or even a year ago—he wants to know what is happening *now*, or at the least, yesterday. So data, accurately recorded, quickly available and meticulously used, is becoming increasingly necessary in all aspects of medical work. Since computers are designed to handle large amounts of data, and rapidly, there should be grounds for co-operation between the two disciplines of medicine and computing.

With regard to the seeming inflexibility imposed by the preplanning necessary for programming, this is more apparent than real. One can have what can be called, for want of a better, “planned flexibility”. The important thing is that the program for any particular job should be written to be able to recognise all the different situations which could occur, even if the user does not know how to—or indeed want to—cope with some of them. It is always possible to include in a program a

facility for printing a warning message if a situation should occur for which the procedure is undefined, and one can also arrange for the program to stop or to take some other action in such a case. But the important thing is to admit that some situation or other *could* arise, even if it is not expected to do so. For example, if a formula is not valid outside a certain range of values, then even if the user is pretty certain that this range covers all his or her data, or that no value outside this range has ever been observed in a patient, it is worth mentioning the region of validity of the formula in the definition of the problem, so that the program can screen for invalid data. At least this will detect erroneous values and codings, and perhaps even discover the first case to be found with a value outside the accepted range.

Applications

An increasing number of medical workers are overcoming their entrenched fears of quantitative science and are looking more and more towards such techniques and the instrumentation needed to implement them. Because of its versatility, the computer is currently attracting the most widespread interest of all. The applications so far have been extremely varied and not always where one would expect to find them.

Diagnosis

Early enthusiasts started by using computers to implement statistical techniques for carrying out differential diagnosis. This was perhaps an unfortunate choice since the statistical problems involved have by no means been solved, and although the application is an extremely interesting one and promises to be of real assistance in differential diagnostic work, it could be argued that perhaps a disproportionate amount of effort was used up at an early stage of the development of medical computing which might have been more profitably applied in other areas at the time. It was also a bad move psychologically, since it appeared to intrude the alien subject of mathematics right into the most sensitive area of the doctor's professional competence at a time when the profession was unprepared for it, and like all such intrusions, it met with considerable resistance. In spite of this, studies in the differential diagnosis of e.g. thyroid disease (Ref. 1), of intracranial tumours (work which was and is being carried out at this hospital—Ref. 2), of heart disease (Ref. 3) and many others conditions have shown that quantitative computer-aided techniques can help considerably in differential diagnosis. The exact rationale for computer use in this area has yet to be worked out, and depends very much on the facilities available and the ease with which physician-computer communication can take place (Ref. 4). One side-effect of such studies has been to bring about a close consideration of the definition and nature of disease and the meaning and utility of diagnosis (e.g. Ref. 5).

Laboratory Automation

Probably the most successful area of medical computing to date has been in clinical biochemistry. The work-load in clinical biochemical laboratories has been doubling every five years over the past two decades, and although the build-up in the actual chemical analyses

has been adequately coped with through the widespread use of autoanalysers, the extent to which these machines would lead to a concomitant increase in data-handling does not appear to have been fully realised when they were first introduced. The computer is really the complement to the autoanalyser in laboratory automation, permitting both the efficient control of very large data flows through the laboratory and also the possibility of data analyses on a scale hitherto impossible. One of the earliest computer-based systems to be installed in this country was an experimental five-channel auto-analyser set up at University College Hospital, London, in 1964, and this has recently been extended to handle nineteen different analyses on a routine basis (Ref. 11); comparable systems are in use at Belfast, Birmingham and Hammersmith, and other developments are under way elsewhere.

The main advantage gained from such systems is the reduction of time spent by technicians and other staff in clerical work—estimated by one author (Ref. 6) as 30% of working time. This means that they can spend more time on actual laboratory work, with consequent increase in throughput and reduction in turn-around time. Another advantage is that a check can be kept on laboratory performance by means of what is known as *quality control*—a widespread industrial technique which modern data processing methods now make possible in the pathology laboratory (Ref. 7). In addition, they also offer the prospect of tapping for research purposes the very large quantity of data locked up in clinical pathological reports. Some very interesting results have already been reported by Whitehead (Ref. 8).

Radiotherapy

Interest is also growing steadily in the use of computers in radiotherapy, though this application has not advanced into routine use as rapidly as one might expect when it is realised that the first published work in this field appeared in 1955 (Ref. 9). In this country, computers are in routine use in radiotherapy at, for example, University College Hospital, Middlesex Hospital, Hammersmith Hospital, Addenbrooke's Hospital (Cambridge), Bristol Royal Infirmary, and at hospitals in Glasgow and Manchester. The growth of the subject was hampered to some extent at one time by a long debate as to whether it was necessary in ordinary two-dimensional treatment planning to have the detailed information provided by computer analysis as against the less detailed calculation carried out by an experienced physicist or radiotherapist, who would interpolate for distributions from spot point calculations, using his experience and/or atlases of dosage distributions. As with so many other applications, the answer to this has depended on the ease or difficulty of access to computing facilities, the type of computer available, the nature of its input and output and also on the type of dosage calculations involved. It is generally agreed, for instance, that arc therapy requires computer assistance, but not every radiotherapist uses arc therapy (perhaps because of the computing required—a chicken and egg situation). But even in fixed-field planning, the computer enables a wider range of alternative plans to be considered for any case than when manual methods are used, and also enables more complicated field arrangements to be investigated. In particular, accurate

calculation of three-dimensional dosage distributions due either to external beam therapy, to interstitial or intracavity implants or to a combination of both external and internal sources cannot be worked out in a meaningful time without a computer (Ref. 12). The increasing interest in such configurations, along with the vastly easier access to computers nowadays and the mushrooming development of devices for graphical or pictorial computer output mean that this application for computers will become increasingly widespread.

Apart from treatment planning, computers are being used in a wide variety of ancillary radiotherapeutic calculations, such as calibration of collimators, analysis of film-badge data, etc. The use of computers in radiation therapy has already been the subject of two international conferences—at Cambridge in 1966 and at Chicago in 1968—with another to come at Glasgow in September this year.

Other Applications

There is not space here to give details of the many other applications in medicine for which computers are currently being used or tried out; they include, e.g., retrospective analyses of case history or drug trial data, statistical studies on disease patterns, automatic karyotyping, analysis of physiological signals such as ECG, EEG and EMG recordings and of course many aspects of hospital management and the organisation of patient care, such as finance and accounting, H.A.A., organisation of outpatients clinics and scheduling of student nursing training. Two very good surveys of the subject are references 10 and 11.

Computing at Barts

Perhaps it would be appropriate to close with some remarks on the situation at Barts. Computing science is already making a contribution in this Hospital to both research and routine work, both medical and administrative. Salaries, wages and stores accounting for the Hospital are processed on a computer belonging to one of the Regional Boards. Mention has already been made (Ref. 3) of research into the use of a computer in the diagnosis of intracranial tumours; the same machine (at City University) is being used to analyse data from brain scans, an established technique using radioactive tracers in the detection of brain tumours and which has been used routinely in this Hospital since 1964. Computer processing also plays a part in current research work on gastric emptying, and the Department of Clinical Neurophysiology has a computer of its own which is used for research on the analysis of EEG waveforms and also contributes to the clinical work of the Department. The Physics Department of the Medical College has a computer which is used mainly for statistical analyses.

In general, however, computing at Barts is not a particularly widespread activity. The examples quoted have arisen as a result of individuals deciding within their own particular projects that they needed computer assistance, and until recently there has been no centralised effort behind the introduction of computing into the Hospital and in particular no organised attempt at bringing computer technology and possibilities to the notice of the staff generally. It is intended that the Computer Unit for Medical Sciences, whose premises and computer are expected to be in being in the Autumn,

will catalyse this. The Hospital and College have also set up a Joint Committee whose function is, among others, to supervise the co-ordination of future developments and the use of computers throughout the Hospital and Medical College.

The Computer Unit is a joint project of the Hospital, the Medical College, and the Department of Health and Social Security. Its brief from the Department is to carry out research into the use of computers in patient monitoring, both in ward and operating theatre, and also to evaluate a stock control project for the Central Sterile Supplies Department. Work has already started on the necessary program development in the patient monitoring work, in collaboration with the Departments of Cardiology and of Medical Electronics. However, although its primary commitment will be to the patient monitoring and C.S.S.D. work, the computer will be available for other work as well, and we hope that Hospital and College staff and students will avail themselves of the chance of making use of it. The Unit intends also to act as an advisory and educational centre, where staff and students will be able to learn about computers and how to use them, where they will be able to come for advice and help with their problems and where they will be able to keep themselves informed of the continual developments in medical computing. The Unit is already actively helping various Hospital departments, and an introductory course on computers and their use in medical work has been given; other courses will follow. It is only by the creation of an educated climate of opinion among potential users, followed by experiment and evaluation initiated

by the people with the problems, that it will be possible to decide on the true and proper role for the computer in medicine, both here and elsewhere.

References

- 1 BOYLE, J. A., GREIG, W. E., FRANKLIN, D. A., HARDEN, R. M., BUCHANAN, W. W. and MCGIRR, E. M. Q. *Jl. Med.*, 35: 565. (1966)
- 2 DU BOULAY, E., and PRICE, V. E. *Br. J. Radiol.* 41: 762. (1968)
- 3 WARNER, H. R., TORONTO, A. F., VEASEY, L. G. and STEPHENSON, R. J. *Am. med. Ass.* 177: 177. (1961)
- 4 BOYLE, J. A. and ANDERSON, J. A. in: *British Medical Bulletin*, Vol. 24, No. 3 (September 1968).
- 5 SCADDING, J. G. *Lancet*, 2: 877. (1967)
- 6 TAYLOR, T. R.: "Principles of Medical Computing". (Blackwell, 1967)
- 7 HEALEY, M. J. R., in: *British Medical Bulletin*, Vol. 24, No. 3. (September 1968)
- 8 WHITEHEAD, T. P., in: "Progress in Medical Computing". (Blackwell, 1967)
- 9 TSJEN, K. C.: *Br. J. Radiol.*, 28: 432 (1955) and 31: 32 (1958).
- 10 "Computing in Medicine". September 1968 issue of the *British Medical Bulletin* (Vol. 24, No. 3) (See also refs. 4 and 8 above).
- 11 "Computers in Medicine". B.M.A. Planning Unit Report No. 3 (October 1969).
- 12 HOPK, C. S., in: "Computers in the Hospital Service" (Western Regional Hospital Board, Scotland, 1965).

BARBECUE BALL 1970

"Life's for living, yeah that's our philosophy" raved Mungo Jerry's record at intervals throughout the evening, and how accurately he summed up the atmosphere at the 8th Barbecue Ball. No one could dispute that it was better than the previous ones, and next year's organiser has my sympathy for the high standard he must maintain. Still, we've been saying that ever since they started, and things are improving all the time, so no doubt he'll think of something.

The layout was basically the same as usual, the main action taking place in a marquee on the lawn, with other attractions arranged in the various rooms of College Hall. Despite the threat of imminent exams for everyone, the amount of man-hours put into the meticulous preparation must have been astronomical, but so impressive was the result it was easily worth-

while. It's really unfair to pick out individual points, but Colin Brookbanks French-style Recreation room deserves special mention, while the Foyer with its Japanese garden complete with pond, fountain and miniature bridge showed greatest originality.

Mike Elliott supplied us with the music, and it was nothing if not varied. "Harmony Grass", a one-record-wonder pop group spent too much time talking and not enough singing, considering they were playing at a dance, but no doubt some would say it was quite a good idea. Matthew's Southern Comfort, operating in the Refectory were unbelievably good, as shown by the attendance at their second performance. The Discotheque thumped away happily in a gym cunningly disguised with acres of tin-foil as a Soho Night Club, and an excellent Jazz band provided an alternative to Pop in



the Abernethian Room. When all the others had finished the Steel Band in the marquee was still banging away at 5.30 for the real groovers dancing on the lawn in broad daylight. Finally the Spinners, a Liverpool bred Folk group, gave a really professional performance to a wildly receptive audience in the Refectory in the early hours. To begin playing at 2 a.m. as if it were 9 p.m. must really take some doing, but that's Show Biz for you. None other than Dick Emery turned out to be the Surprise Cabaret, appearing first as the young lady and then the old man featured in his television programme, and his act was predictably hilarious. Even though we'd all heard some (most?) of his jokes before, he told them very, very well.

The food arrangements showed a change from last year, in that the Barbecue was operated by a group from Smithfield who do it as a "hobby". They also served up an excellent breakfast for those who could

face it and not only was there more food but it was of a better quality. The whole Ball was of better quality, really, perhaps partly as a result of the raised price of a ticket and greater number sold—500 doubles, but mainly because of the unceasing hard labours of Mark Navin and his boys. While on the subject, the Wine Committee would like to thank everyone who gave them assistance in their hour of greatest need. My only criticism lies in the manner of nosh distribution. How much longer must we put up with scrums far worse than those seen on rugby cup-final day centred around the Barbecues, and queues stretching almost to Cheapside at the Strawberry counter?

Apart from this, congratulations to all concerned; it was a great Ball. Only one thing was missing, though, a midnight swim by a drunken houseman in the Japanese pond.

JOHN LAIDLAW.

NURSING IN ST. BARTHOLOMEW'S HOSPITAL IN THE 17th CENTURY

by
Nellie J. M. Kerling, St. Bartholomew's Hospital

When speaking about St Bartholomew's Hospital and St. Thomas' Hospital, M. E. Grey in: *Progressive Professional Nursing*, (Edinburgh, 1950) says on pp. 2, 3 that after the Reformation these Hospitals were "actually dens of iniquity and vice. Nursing was at its lowest ebb and remained so until the 19th century". One wonders whether this statement is true but only a careful study of the available records can give us the right answer.

After the execution of King Charles I on 30th January, 1649, Cromwell's friends tried to get influence in St. Bartholomew's Hospital and in October 1650 Colonel Pride had to be admitted a Governor who was an ardent follower of the Protector, well-known because of his assistance to the so-called purge of Parliament. He soon tried to prove that the Hospital was not managed properly and that funds were being misappropriated. In order to avoid trouble the Governors wished to enforce discipline as strictly as possible and they decided to re-print the *Rules and Orders* of the Hospital which had first been issued in 1552. Strangely enough no alterations were made and the editions of 1552 and 1652 are exactly identical. The charges to the Matron and to the Sisters composed in the middle of the 16th century were therefore used throughout the 17th century as well. They show that the Sisters were instructed to obey Matron, to be in their ward, called the Sisters' ward, by 7 p.m. in winter and by 9 p.m. in summer and as to the care of the sick, they had to keep them "swete and cleane", give them "their meates and drinckes after the moste honest and comfortable maner", speak to them in "good and honest talk" and avoid "lyght, wanton and foolish wordes" and above all drunkenness.

Judging by these instructions the Sisters were not required to do much more than washing their patients, keeping the beds clean and feeding the sick with food prepared by the Hospital's cook but in reality the Sisters had an extremely busy life. In 1600 Matron had 11 Sisters under her, in 1623 there were 14 Sisters, 15 in 1676 and in 1685 the Hospital had 16 Sisters everyone of whom was in charge of a ward though some seem to have had two small wards. Towards the end of the 16th century the Governors decided that no more than 120 patients should be admitted at one time but in practice this number was often higher. Divided over about 14 or 15 wards in the 17th century, this means that during that century the Sisters probably each had the care of 9 or 10 patients. As far as nursing was concerned they received their instructions from the surgeons, physicians and the apothecary. The surgeons looked mostly after their own patients for they or their pupils dressed the wounds though it is possible that the Sisters sometimes gave some assistance by applying ointments for instance, but no direct evidence has come

to light for St. Bartholomew's Hospital. The physicians and the apothecary relied much more on them. Until 1653 patients had to be brought to the physician when he visited the Hospital and the Sister of each ward was responsible that everyone who needed him went to see him. In the second half of the 17th century the physician was instructed to visit the bedridden patients in their wards and here again he depended on Sister's opinion. His prescriptions were prepared by the apothecary and the Sisters had to ensure that patients took their "phisick" and did not "caste it away and abuse it". They had also to carry out the physician's instructions for special nursing such as for patients in the Fluxing ward¹ who had to be kept very warm in flannel, or for those who were put on a special diet and for whom they had to make broth and "cawdies" which they apparently often did on the open fires in the wards. They had to keep their patients "swete and cleane", that is to wash them, their clothes and their bed linen. This laundry, called the Buck, was a very heavy task. Until 1687 wood ash was used but after that year soap was introduced. Sheets were washed once in every three weeks by the Sisters who did this work in rotation though the older ones were generally excused. By the middle of the 17th century some assistance was given by a "Buckwoman" who "drove" the Buck. Each Sister was responsible for the number of sheets used in her ward and for drying, pressing and mending them. The patients' "shirts and smocks" had to be added to this 3-weekly laundry. Until 1665 this additional work was done without any charge to the poor but when the wounded sailors and soldiers of the Navy had to be admitted during the Anglo-Dutch Naval wars, the Sisters were paid 2d. extra a week per patient for this work and this payment was kept at this rate during the remaining years of the 17th century. The Sisters had also to clean their own wards, a most necessary task in a time when cleanliness of the poor was almost unknown. In 1672 one Sister even white washed the walls to make her ward look "handsome". The patients needed their "meates and drinckes" and the Sisters had to fetch this personally from the kitchen unless they were too weak or too old to carry everything in which case a trustworthy patient was allowed to help her. Though the Hospital engaged a waterbearer from the middle of the 16th century onwards to bring water to the wards, coal for the wardfires was carried by the Sisters until 1660 when two men were paid to do this work for them.

1 Patients suffering from the "bloody flux" or dysentery. See about their treatment: J. J. Keevil, *Medicine and the Navy, 1200-1900*. Vol. II (1649-1714), (London, 1958), p. 167.

Attending to the patients and their needs, washing them, cleaning the wards, working at the laundry, pressing and mending sheets, washing the patients' linen, fetching food and coal was all part of a busy day. They had to be in the Sisters' ward by 7 p.m. in winter and by 9 p.m. in summer but even when off duty they did not relax. As late as 1678 Matron was ordered to buy hemp to be spun by them for the Hospitals' supply of cloths. If a patient needed special attention Matron could give permission to the Sister in charge to sit near the bed and in winter the steward provided her in that case with special "watchcoales". In addition to all these duties, Sisters were expected to go to Church on Sundays with their walking patients and during the Commonwealth period they were ordered to attend divine service every "Sabbath day" in the morning and afternoon as well as on Thursday and on Saturday both in the morning and in the afternoon. Having no pension the Sisters often worked until their dying day. Pathetic cases are mentioned in the records of women who were too old to work but who had to continue as they had no other income and no relations to look after them. Having no family ties was partly due to the attitude of the Governors who always appointed spinsters or widows in order to avoid any trouble caused by husbands or children.

Discipline was in the hands of Matron. In the 17th century the Governors of St. Bartholomew's Hospital never appointed a Matron who had been a Sister in the Hospital but they chose women who had experience as a housewife and who—one imagines—were of a better social class than the average Sister. They seem to have followed the example of St. Thomas' Hospital where the Matron had to consider herself as a housewife and chief mistress.² According to the Rules of 1552 and 1652 Matron had to place the new patients in their respective wards, she had the "charge, governance and order" of all the Sisters, she had to set the Sisters to work, such as spinning when they were not occupied with the sick, and she had the care of all the sheets, blankets, beds and other utensils.

The Civil War brought a number of wounded soldiers to the Hospital and judging by the Minutes of the Governors they were often a turbulent lot. To lighten the heavy burden of the Sisters, assistants were accepted probably for the first time in 1646. In 1650 the Hospital counted four such assistants and the Matron of that time, Margaret Blague, must have realised the value of their work and of their experience. It was no doubt with her approval and perhaps even at her suggestion that in February 1651/2 the Governors adopted the rule that only those who had been a nurse and had worked at the laundry should be appointed to the place of a Sister, provided she had the approval of Matron. This is the first time the word nurse is used in the records of St. Bartholomew's Hospital though the word was already in use in the English language by the end of the 16th century. From 1652 to 1677 women were appointed to be a Sister or a nurse and it was left to the decision of Matron which of these functions they were going to have. After 1677 the word "helper" is mentioned as well and the word nurse seems by then to indicate a more experienced woman. In 1689 for

instance some one who was asked to be a "nurse or a helper" refused to be a mere helper and in 1692 a helper was elected to be a Sister of a nurse. It appears therefore that towards the end of the 17th century St. Bartholomew's Hospital knew three grades in the nursing profession: helper, nurse and Sister. This graduation was by no means always carried out in practice and all through the 17th century, Sisters' posts were sometimes given to outsiders as for instance in 1689 to Lettice Dyne, a widow "being a person that hath lived well and Irish Protestant". Fortunately this choice at any rate proved to be a good one for she served the Hospital for 32 years and in 1721 she was dismissed at the age of 80 with a yearly grant of £10. During all those years her name never appears once among those who were reprimanded. Notwithstanding such appointments of out-siders we can see here the beginning of the distinction between student-nurse staff-nurse and Sister.

All through the 17th century Sisters were occasionally reminded that they had received instructions to obey Matron and that they had to remain single, as spinsters or widows without the charge of children. A Sister who married was dismissed and new ones if they were widows and had children, were asked to give a surety that they should not become a burden to the Hospital. Matron's ruling of the Sisters had to be accepted unconditionally. When Sister Dorothy Ridley complained in 1655 that Matron had kept her 7 years out of the place she now at last enjoyed, she was only reprimanded by the Governors as one who had no right to criticise. In 1672 Mary Cotten, a young Sister of Queen's ward for women, was ordered by Matron to change places with the much older Sister of Soldiers' ward for men as the work in this last ward was very much heavier than in the women's ward. Mary Cotten refused on the grounds that she was appointed by the Governors and that only they could remove her to another place. The case came before the Board of Governors who confirmed Matron's order because she "hath the rule and ordering of all the Sisters".

Was St. Bartholomew's Hospital a "den of iniquity and vice"? It is true that a number of Sisters were missed in the 17th century but not until about 1650 are their names and misdeeds mentioned in the records. Their cases make sad reading: the poor's medicines were sold, the poor were asked money for sitting on chairs in the wards, three Sisters fought and abused each other in vile language, one or two smuggled a man in the ward at night, but then we have to remember that nothing is ever said about the ones who did carry on their daily duty without giving reason to complaints and we must be careful not to judge a whole group by the misconduct of some of its members. When one considers all the dismissals between 1655 and 1700 it appears that 31 Sisters were dismissed and five helpers. Of the Sisters two were too old, one was pregnant, three got married, three resigned at their own request and one was dismissed because she was a Roman Catholic. Of the helpers one was pregnant and one married. Leaving these special cases out, one can say that 21 Sisters and three helpers were dismissed because of misconduct in 45 years. Over the same period 41 Sisters were reprimanded and two helpers. Taking the average number of Sisters for the 17th century as 15, we come to the conclusion that about 3% of them were unsatisfactory and about 6% needed an occasional re-

2 Greater London Council Record Office. Archives of St. Thomas' Hospital, H 1/1 f. 34 dorso.

minder, in other words there is no reason to label this Hospital as a "den of iniquity and vice".

Was nursing at its lowest ebb? One should realise that the knowledge and skill of physicians and surgeons was only just beginning to develop and consequently nursing was not the highly skilled profession of the present day but it was more like home-nursing, keeping the patients warm, comfortable and clean in a clean bed and a clean ward, giving them their food and medicines as instructed by the physician. This does not mean that it was of less value than the nursing of today. The same care and devotion must have prevailed in the 17th century as in any other century. No record mentions that Sisters gave up their work during the periods of the Plague for instance but on the contrary we find a number of references which show that the Governors appreciated them. In 1645 and again in 1646 each of the Sisters was given a gratuity of 10/- for all their extra trouble caused by the wounded soldiers of the Civil War. When in 1650 Joan Old had to resign after 20 years of service, she then being 80, she was given a pension of 3/- a week and in winter she received three bushels of seacoal. In 1678 Margaret Rous who had been a Sister for 10 years was allowed to stay in one of the women's wards receiving a weekly allowance of 3/6d. during the pleasure of the Governors.

In the course of the 17th century the position of Matron was greatly strengthened. She had not only control over the Sisters but she had the power to ask

for their dismissal if they were unsuitable and she decided whether a woman should be a helper, a nurse or a Sister. If she was an intelligent and wise woman her influence must have been felt by every one on the nursing staff thus ensuring good nursing conditions. The 17th century system depended very much on the personality of the Matron and St. Bartholomew's Hospital was fortunate in having two Matrons who both were exceptional women and who between them served the Hospital for nearly 60 years: Margaret Blague, widow of a Barber Surgeon who was Matron from 1643 to 1674 and Mary Libanus, a Minister's widow, who served the Hospital as Matron from 1674 to 1697. How important the personality of Matron was is shown towards the end of the 17th century when Mary Libanus was old and ill. Very soon discipline became slacker until it was re-enforced again by Mary Sanders her assistant, afterwards her successor, whom the Sisters were told to accept "as their Governesse" thus ensuring again a stricter supervision than the old Matron was able to give. Having no pensions women stayed on too long and one can criticise the 17th century Governors for letting 80 years' old Sisters carry on, but even so rather than looking down on the 17th century one should realise that during this period of the Hospital's history the foundations were laid for the future development of the division student-nurse, staff nurse and Sister, and for the important position of the Matron.

SPORT

TENNIS CLUB REPORT

We had a successful tennis season last year, even though it was rather inconclusive. We were runners-up in both the UH and UL Cups and came second in the tennis league.

This year we welcome a number of new players to the club, three of whom, Ed Dismuke, Adrian Dickson and Tony Hambly, have played for the first VI. With the addition of these new players and with more or less the same team as last year we had high hopes of doing the hospital tennis hat trick and winning all available honours.

However, to date, it seems that we are once again denied the UL Cup. We came through the first two rounds without difficulty beating Queen Mary's College 6½-2½ and the Royal Holloway 6-0. In the semi-finals we had a close win against a good Mary's Hospital side 5-4. We were beaten in the finals with an unavoidably depleted side by a very proficient LSE team who took seven out of the nine rubbers.

In the UH Cup, following a bye in the first round, we beat Mary's Hospital 6-3. We are, at present, about to play KCH in the semi-finals and, although we are

reluctant now to prophesy, our chances appear to be quite promising.

In the League we are vying with St. Mary's Hospital once again for first position and this match is still to come.

The Staff Match was played for the first time this season on the Hospital Sports Day. Mr. Dowie, Mr. Letting, Dr. Kelsey Fry and Chris Garrard represented the staff and, although nobody was quite sure of the final score, everyone agreed that it had been well worthwhile. We adjourned afterwards to Dr. Kelsey Fry's home where we were treated to a magnificent buffet supper with drinks.

For the first time this year we have been fortunate to have professional coaching sponsored by the president and vice-presidents of the club. Many members of the club have taken advantage of this and I feel that it has been reflected in the overall results of the season. Of the 13 matches played so far this season between the 1st and 2nd VIs we have lost only two.

Those who have played in cup matches so far are—N. Perry, J. Corbin, E. Dismuke, J. Ussler, A. Dickson, C. Hunt, J. Wellingham, C. Higgins, T. Hambly.

LACROSSE COMES TO BARTS

Sunday, June 7th

On a warm and sunny day at Mortlake, Putney Ladies Lacrosse Club were hosts to an experimental Barts team, most of whose previous experience at this very fast and skilful game was in two previous encounters with the same opponents. Having suffered defeats of 8-5 and 12-2 in the past two years our hopes were high of a good result this time and play was fairly even throughout the first half, our physical advantages being more than matched by the superb skill of the girls. Still we held them to 2-0 at half time, thanks to excellent work in defence by Paul Millard, John Carroll and the fearless Howard Rutherford in goal. John Laidlow ("The Flying Gnome") played well on the wing, giving the girls some hairy moments, and there were several near misses by our other forwards.

In the second half Putney, who fielded four internationals, took control early on and scored several goals in quick succession, largely due to the artistry of Pippa Swayne, one of England's top lacrosse stars. Barts never lost heart and Paul Millard, John Lawn and Janusz Kolendo all went close to scoring, surprising the girls with their unorthodox techniques. Putney however, rallied towards the end and brought their final tally to 8-0. Our thanks go to the Putney Ladies for helping to make the afternoon such a success and we look forward to playing hosts to them at Chislehurst in the autumn for a game of mixed football.

BOAT CLUB REPORT

Since the last report the Junior four have had a fortnights holiday, but are now reassembled and training for Richmond and Egham regattas, on June 27th and July 11th respectively.

On June 13th (the morning after the Barbecue ball), we assembled a Junior-senior four for the first and last time this season. Having had no outings together we had decided to visit the Medway Towns regatta, at Rochester. We arrived to find that our race constituted the premier event of the day; undaunted, we astonished ourselves by beating the two other crews in the final, after the race had twice been delayed for an hour, by a verdict of half a canvas—about six feet! The handsome trophy with which our efforts were rewarded is now on view in the library.

Crew: N. Snell, bow; T. O'Carroll; P. Featherstone; A. Hammer; J. Winner, cox.

Our congratulations to the stern pair of this crew, who rowed in the University boat which won the second coxed fours event at the BUSF championships.

The Annual General Meeting of the club, held on June 29th, will be reported in the next issue of the *Journal*.



TEAMS:

Barts: J. Kolendo (Capt.); P. Millard; J. Laidlow; R. LeQuesne; H. Rutherford; C. Hinds; J. Lawn; J. Carroll; M. White; R. Willis; R. Siwecki; M. Goldsmith.

Putney: M. Crawford (Capt.); P. Swayne (England); S. Clayton (England); M. Beal (England); J. King (Ireland); J. Walker; J. Hall; D. Bell; M. Bellamy; G. Simmonds; S. Lawes; J. Williams (male infiltrator).

Book Reviews

Immunology for Students of Medicine, 3rd Edition. J. H. Humphrey and R. G. White. Blackwell Scientific Publications, Oxford and Edinburgh. 1970. 757 pp. Price 60s.

Immunology is a fast growing discipline, which developed in hospital practice almost imperceptibly until the flurry of recent years. Blood grouping, vaccination and immunization procedures, the recognition of anaphylactic reactions and more recently autoimmune disease, transplantation problems, immune deficiency disease, and tumour immunology. It has been within the past few years that we have been seeing the development of a number of departments within hospitals labelled "Immunology".

For medical students it follows that there is an ever increasing necessity to have a grasp of the basic principles of the subject. Unfortunately with a rapidly developing subject the number of suitable text books is very limited. In the third edition of their new book, Dr. Humphrey and Professor White have carefully gathered together the important basic principles against the background of the very latest advances in the subject.

This book may at first sight seem forbidding with its 757 pages, however for the less enthusiastic student concerned with passing his M.B. it is possible by judicious use of the index to abstract such information deemed necessary for this task. It would be sad if this book were to be used in this limited way. For the more enthusiastic student this will be found to be an invaluable treatise. The present edition has largely been re-written and now includes more information on complement, the mechanism for immunoglobulins, disorders of immunoglobulin production and the immunology of tumours. There is also a more extensive list of suggestions for further reading at the end of each chapter.

The reviewer is delighted to see that as in the earlier editions the first two chapters are still devoted to "history of immunology" and "innate or non-specific immunity". To read in one chapter the evolution of immunology of today immediately gives the student a grasp of the subject. Too often one reads books on immunology that place such a heavy emphasis on the untoward effects of the immune process that it is easy to overlook the beneficial role of this system. This is avoided in this book, indeed a balance is maintained throughout, with a whole chapter devoted to the protective effects of antibody.

The description of fate of antigen and the stimulation of the antibody forming and the memory cells is clearly elucidated. Indeed many of the concepts of antibody formation are so clearly and logically reasoned that it will be almost with surprise that many readers find a sudden understanding of this complex subject.

To now devote a whole albeit short chapter on the complement system probably indicates the growing importance of this system particularly with much of

the work that is in progress in different centres in the world. Possibly the 4th edition will have yet a larger chapter on this subject.

In the chapter on the immunoglobulins it is interesting to note how developments have overtaken the earlier editions of this book. The authors point out that previously the body of opinion supported the view that the IgA was the reaginic antibody whereas now the opinion has firmly settled on its identity as IgE. It is fascinating to read of the development of the work leading to the identification of IgE as reaginic antibody.

The chapter entitled Clinical Aspects of Immunoglobulin Metabolism clearly demonstrate how clinical observations lend support to hypotheses developed from experimental laboratory work. Thus the clear division of the lymphoid tissues into two components, one thymus dependent the other thymus independent, these are clearly demonstrated in the immune deficiency states in man such as Di Georges syndrome, Bruton type agammaglobulinaemia and the combined immune deficiency state "The Sinus Type".

Thus throughout this book there is a constant reference to clinical medicine wherever possible. The authors both distinguished men in this multidisciplinary subject have made a valuable contribution for which all students of immunology, be they medical undergraduates or very senior postgraduates, owe a debt of gratitude.

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A Synopsis of Infectious and Tropical Diseases. A. W. Woodruff and S. Bell. John Wright and Sons Ltd. 1968. Price 47s. 6d.

This book attempts to condense into less than 400 small pages as much factual information as possible about the whole gamut of infectious and tropical diseases, and includes details of aetiology, symptoms, laboratory diagnosis, prophylaxis and treatment. It is aimed at practitioners, postgraduate students and senior undergraduates.

Both Professor Woodruff and Dr. Bell have wide experience in tropical medicine, but neither would claim special competence in bacteriology. This is reflected in the text which is much more authoritative in the sections dealing with tropical diseases than those embracing common bacterial conditions. In particular the nomenclature of bacteria is confused, inconsistent and often out of date. There is also a marked inequality of treatment; thus typhoid merits 25 pages whereas tuberculosis scarcely gets a mention.

Details of the isolation and recognition of causative bacteria and parasites are included and many inaccuracies in these sections could have been avoided if the authors had enlisted the aid of a competent laboratory technician. The descriptions of the morphological features of parasites, helminth eggs, etc., which are included are virtually useless in the absence of illustrations.

It is the opinion of this reviewer that highly condensed synopses of this type are of dubious value. No doubt a small book such as this will appeal to undergraduates labouring under the tyranny of examinations demanding factual knowledge, or to harassed practitioners requiring a quick reference book, but it must be remembered that much of the content is necessarily over simplified with many problematic topics appearing as dogmatic statements.

The authors would perhaps have been better advised to restrict their scope to tropical diseases and to offer a more substantial handbook of this important subject which is too often accorded fringe status.

DAVID GREENWOOD.

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Review of Textbook of Orthopaedic Medicine—5th Edition. Volume 1. Diagnosis of soft tissue injuries. Dr. James Cyriax, M.D. (Cantab), M.R.C.P. (Lond.). Balliere Tindall and Cassell. Price 110s.

This bulky (800 page) volume is the latest development of the work published on "Rheumatism and soft tissue injuries" in 1947, and contains Dr. Cyriax's statement of the aims and achievements of "Orthopaedic medicine".

It is a well produced volume containing 137 line figures and 61 plates which are in general clear and illustrate the various points of the text very well, e.g. plate 20 and 21.

The book is divided into three broad sections. The first deals with a general appreciation of the effects, diagnosis and significance both medically and economically, of soft tissue lesions, and contains many interesting statistics of the morbidity of such lesions (i.e. backache etc.) in the U.K. and comments on the savings in man hours of proper (i.e. Dr. Cyriax's) as opposed to conventional treatments.

The second section deals more specifically with the diagnosis and treatment of various lesions, about one-third of which is devoted to lesions of the lumbar spine. This is comprehensive and the details and diagrams concerning anatomy and clinical examinations are particularly valuable. The interpretation of some of the findings to differ from more conventional orthopaedic (surgical) thought however, especially with regard to the lumbar facets. The section dealing with the shoulder is detailed and particularly valuable in those aspects of examination and anatomy contained in it. The sections concerning the knee, leg and foot are largely uncontroversial and very clear in content and lay out.

The remaining section deals with items such as psychogenic pain, manipulation (medical and lay) and finally gives a comprehensive reference list and index.

The book is too large and expensive to recommend for purchase by students or even recently qualified practitioners, but could with its companion volume 2 (not reviewed), form a useful addition to a library as a reference textbook, particularly for details of the examination and anatomy of the various joint systems, and to obtain a somewhat different approach to the treatment of some of the lesions found in these systems from that observed in orthodox orthopaedic surgical clinics.

DAVID L. JOHNS, F.R.C.S.

NOTE:
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OCTOBER
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26th AUGUST

The Nursing and Management of Skin Diseases. D. S. Wilkinson.

The third edition of this textbook fills an important and previously neglected field of dermatological management, providing an accurate and detailed guide to nursing techniques and procedures, to the management of the patient and his skin and also a short but comprehensive formulary.

That a clinical commentary on the commoner skin diseases and simple cutaneous physiology is also presented, adds greatly to the value of this work more especially for the specialist nurse, whether in hospital, industry or general practice to whom this book is particularly directed. The student or practitioner who is recommended to use a standard text in conjunction, will find this aspect much too superficial. The dermatologist also, may not wholly agree with the psychological approach and theory put forward. However, these points, in no way detract from the volume's overall value as the practical aspects more than stand by themselves, and it is these that impress—the simple and concise manner in which directions and procedures are explained and illustrated whether dealing with dressings, skin therapy and hygiene, minor surgical operations or dermatological investigations and their interpretation.

Though not finalist reading material, perhaps, this book holds a great deal of practical know how that would benefit all.

E. ABELL.

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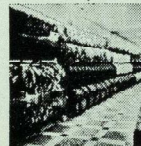
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Full details from

The Secretary H. A. Constable, M.R.C.S., L.R.C.P.,
Medical Protection Society, 50, Hallam St., London, W.1.

SAINT BARTHOLOMEW'S HOSPITAL JOURNAL

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Editorial

With workers in every sector of the community pressing for wage increases each one supposedly more justified than the last, perhaps it is an appropriate time to consider the grants given to students, particularly the Clinical Medical student.

For all his Preclinical years, a student on a full University Grant gets £395 per annum, which works out at £13 for each of the 30 weeks he actually attends College. For the additional 16 weeks attendance required from the Clinical student, however, he gets less than £1 per week. Putting it another way, if the total Grant is divided by the number of weeks in the Clinical year it means £11 throughout the working year. The paradoxical situation therefore arises whereby after obtaining a degree or its 2nd. MB equivalent, the student actually suffers a drop in his "salary". Furthermore, unlike other students he is unable to supplement his Grant by building Motorways or collecting deck chairs in Hyde Park during the vacation for the simple reason that he no longer gets long holiday. It is also true that most of the London Hospitals are situated in or near Central London which means that living expenses are higher than in any other part of the country.

Many students being maintained by their parents get even less than this, for in spite of what County Councils may think not many parents can afford to lavish £11 a week on a Medical training which lasts for at least five and possibly six or seven years, as compared with the normal three year degree course.

The chances of a general increase in Grants are, unfortunately, bleak. With the image of the typical student as a scruffily dressed, drug taking stone throwing demonstrator lounging around at the taxpayers expense, grants are hardly likely to be top of the list in a Ministry of Education pledged to economy. At each fresh wave of student violence the body of people supporting Loans for students grows, but there seems little danger of this happening in Britain. Nothing would send a newly qualified doctor across the Atlantic faster than the thought of having to pay even part of the cost of seven years training out of his precious Houseman's pay. Provided conditions of work allow them to stay in this country any doctor trained should be looked upon as an investment, and when the cost of a National Health Service is so high it is false economy to give Clinical students less than adequate Grants.